Ph.D. in Engineering
Cyberspace Concentration
Recommended Plan of Study (2012-10-04)

Degree Codes: ES PhD ENGR

Contact: Dr. Travis Atkison

Overview
The Cyberspace concentration within the Ph.D. in Engineering aims to graduate engineering researchers who are capable of pushing the frontiers of engineering across the cyberspace domain.

Students without an undergraduate degree in an Engineering program
Take all three of the following:
- ENGR 220 Statics & Mechanics of Materials
- ENGR 221 Electrical Engineering and Circuits I
- ENGR 222 Thermodynamics
(and any other deficiency courses recommended by the Advisory Committee)

General Core courses
Take the first two and choose one from the remaining two (9 SCH):
- ENGR 641 Formulation of Solutions to Engineering Problems
- MATH 574 Numerical Solution for PDE I
- STAT 620 Theory of Probability
- STAT 621 Theory of Statistics

Disciplinary Core courses
Choose four of the following (12 SCH):
- CSC 542 Introduction to Cyber Security
- CSC 554 Advanced Networking
- ELEN 512 Electromagnetic Waves
- ELEN 535 Advanced Topics in Microelectronics
- ELEN 565 Digital Signal Processing
- MATH 435 Introduction to Graph Theory
- MATH 460 Number Theory
- PHYS 511 Electromagnetic Theory

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 hours for the seminar may be counted towards the degree.
Independent Study and Special Topics (12 SCH)
At least two Doctoral level Special Topics courses (ENGR 657) are part of the required coursework for the degree, for a total of 6 hours. A Ph.D. student must participate in 6 hours of Doctoral Independent Study (ENGR 650) under the supervision of a faculty member. Independent Study can be a preparation for the research leading to the dissertation.

Recommended Elective courses
In addition to the courses listed in the General and Disciplinary cores (above), a student may take any of the following elective courses. Courses not listed here or in the General and Disciplinary cores are also acceptable, provided they are approved by the Advisory Committee.

Choose four of the following (12 SCH):

- CSC 575 Advanced Topics in Artificial Intelligence
- CSC 585 High Performance and Availability Computing
- CYEN 501 Digital Forensics and Cyber Crime
- CYEN 502 Access Control Logic & Covert Channels
- CYEN 503 Wireless & Mobile Security
- ELEN 533 Optoelectronics
- ELEN 561 Random Signals and Systems
- ELEN 567 Wireless Sensor Networks
- ELEN 572 Digital Control Systems I
- ELEN 573 Digital Control Systems II
- MATH 535 Graph Theory
- MATH 575 Numerical Solution for PDE II
- PHYS 512 Solid State Physics
- PHYS 540 Computational Methods in Physics Modeling and Simulation I
- PHYS 541 Computational Methods in Physics Modeling and Simulation II

Research and Dissertation (18 SCH)
A minimum of 18 hours (ENGR 651). Take 3, 6, or 9 hours per term. Maximum total allowed is 30 hours.

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