

**Ph.D. in Engineering**

**Degree Codes:** ES PhD ENGR

**Concentration:** Cyberspace Engineering

**Contact:** Professor Jean Gourd

Course Category	Number	Course Name		SCH
<b>*Students <u>without</u> an undergraduate degree in Engineering</b>	ENGR 220	Statistics & Mechanics of Materials	3	9
	ENGR 221	Electrical Engineering and Circuits I	3	
	ENGR 222	Thermodynamics	3	

**Ph.D. Curriculum**

<b>Core Courses</b>	ENGR 641	Formulation of Solutions to Engineering Problems	3	9	
	MATH 574	Numerical Solution for PDE I	3		
	Select one of the following two courses				
	STAT 620	Theory of Probability	3		
	STAT 621	Theory of Statistics	3		
<b>Concentration Courses<sup>1</sup></b>	Select four (12 semester hours) of the following			12	
	CSC 543	Digital Forensics and Cyber Crime	3		
	CSC 552	Distributed and Cloud Computing	3		
	CSC 554	Advanced Networking	3		
	ELEN 512	Electromagnetic Waves	3		
	ELEN 535	Advanced Topics in Microelectronics	3		
	ELEN 565	Digital Signal Processing	3		
	MATH 435	Introduction to Graph Theory	3		
	MATH 460	Number Theory	3		
PHYS 511	Electromagnetic Theory	3			
<b>Qualifying Examinations<sup>2</sup></b>	ENGR 685	Written Qualifying Exam	0		
	ENGR 686	Oral Comprehensive Exam	0		
<b>Doctoral Seminar</b>	Enroll in ENGR 610 (3 SCH) once or ENGR 611 (1 SCH) three times			3	
<b>Directed Study</b>	ENGR 650 <sup>3</sup>	Doctoral Directed Study (taken twice)	6	6	
<b>Electives</b>	Select six courses (18 SCH) from electives list or others approved by advisory committee			18	
<b>Research and Dissertation<sup>4</sup></b>	ENGR 651	Pre-Candidacy Doctoral Research	1-9	9	
	ENGR 751	Post-Candidacy Dissertation Research	1-9	9	
				Total 66	

<sup>1</sup>The concentration courses for the concentration in Cyberspace Engineering.

<sup>2</sup>The qualifying examinations are managed by the Chair of the Advisory Committee. ENGR 685 consists of a written paper and presentation discussion of one or more research article(s) in a complementary area to the student's research. ENGR 686 involves a presentation focused on the student's proposed doctoral research. ENGR 685 and 686 should be attempted in the same quarter for this track, and may only be repeated once.

<sup>3</sup>Taken under the supervision of the faculty member. Can be a preparation for the research leading to the dissertation.

<sup>4</sup>Complete 9 SCH of ENGR 651 prior to ENGR 686. After successful passing ENGR 686, complete 9 SCH of ENGR 751. Registration in any quarter is for 1 to 3 semester hours or multiples thereof, up to a maximum of 9 semester hours per quarter.

\*Students are expected to have published one or more peer reviewed journal publications or conference proceedings by the time they graduate.

### Suggested Electives

CSC 575	Advanced Topics in Artificial Intelligence	ELEN 567	Wireless Sensor Networks
CSC 576	Data Analytics Tools and Applications	ELEN 572	Digital Control Systems I
CSC 579	Data Mining and Knowledge Discovery	ELEN 573	Digital Control Systems II
CSC 580	Advanced Data Mining, Fusion, and Applications	MATH 535	Graph Theory
CYEN 501	Digital Forensics	MATH 575	Numerical Solution for PDE II
CYEN 502	Access Control Logic & Covert Channels	PHYS 512	Solid State Physics
CVEN 503	Wireless & Mobile Security	PHYS 540	Comp. Methods in Physics Modeling and Simul. I
ELEN 533	Optoelectronics	PHYS 541	Comp. Methods in Physics Modeling and Simul. II
ELEN 561	Random Signals and Systems		

**Plan of Study Important Information:** When entering information in the plan of study, it is important to note that only core courses and all core courses need to be put in section 1.1, while all others are put in section 1.2 (i.e. special topics, seminar, and research courses). See <http://coes.latech.edu/grad-programs/plan-of-study-instructions.pdf> for plan of study instructions.

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