

Ph.D. in Engineering

Degree Codes: ES PhD ENGR

Concentration: Materials and Infrastructure Systems

Contact: Professor Jay X. Wang

Course Category	Number	Course Name		SCH
Core Courses	ENGR 641	Formulation of Solutions to Engineering Problems (Fall)	3	9
	STAT 620	Theory of Probability (Fall)	3	
	MATH 574	Numerical Solutions of PDE (Spring)	3	
Concentration Courses¹	Select four of the following courses			12
	CVEN 459	Introduction to Infrastructure Management	3	
	CVEN 580	Introduction to Trenchless Technology	3	
	ENGR 530	Engineering Experimentation and Research	3	
	MEMT 508	Finite Element Analysis	3	
	MEMT 511	Modern Engineering Materials	3	
	MEMT 563	Theory of Elasticity	3	
	MEMT 577	Advanced Strength of Materials	3	
Qualifying Examinations	ENGR 685	Written Qualifying Exam ²	0	
	ENGR 686	Oral Comprehensive Exam ³	0	
Doctoral Seminar	ENGR 611	Dissertation Enhancement Seminar (taken three times)	1	3
Directed Study	ENGR 650 ⁴	Doctoral Directed Study	6	6
Electives	Select six (18 semester hours) from electives list or others approved by advisory committee			18
Research and Dissertation⁵	ENGR 651	Pre-Candidacy Doctoral Research	1-9	9
	ENGR 751	Post-Candidacy Dissertation Research	1-9	9
				Total 66

¹ The concentration courses for the concentration in Micro and Nanoscale Systems Engineering.

² For ENGR 685, a student may contact the PhD program coordinator and at least 4 instructors who taught those core courses or electives. The instructors will submit questions out of which the exam questions will be chosen by the program coordinator.

³ ENGR 686 is a presentation of preliminary research achievements and a defense of proposed PhD research. A written proposal, uploaded in a student's plan of study and approved by their committee, is required before a student may enroll in ENGR 686.

⁴ Taken under the supervision of the faculty member. Can be a preparation for the research leading to the dissertation.

⁵ 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 publish at least one peer reviewed publication or conference proceeding by the time they graduate.

Suggested Electives

CMEN 513	Transport Phenomena	INEN 506	Dynamics Programming
CVEN 509	Dynamic Analysis of Structures	INEN 509	Advanced Engineering Economy
CVEN 510	Advanced Soil Mechanics	MEMT 565	Continuum Mechanics
CVEN 517	Advanced Pavement Design	MEMT 588	Inelastic Deformations
CVEN 540	Advanced Foundation Engineering	STAT 506	Regression Analysis
ENGR 566	Quality in Engineering	STAT 511	Design of Experiments
ENGR 590	Applications of Artificial Intelligence	STAT 620	Theory of Probability
ENGR 592	Engineering Computational Methods	STAT 621	Theory of Statistics
ENGR 631	Global Competitiveness & Management of Science And Technology	STAT 651	Discrete Markov Processes
INEN 504	Systems Simulation		
INEN 504	Systems Simulation		

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).

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