

Ph.D. in Engineering

Degree Codes: ES PhD ENGR

Concentration: Materials, Systems, and Infrastructure

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	<u>REQUIRE research advisor's approval</u> - Select four from the following courses <u>in consultation with your research advisor</u>, three of which must be from the same discipline			12
	CVEN 517	Advanced Pavement Design	3	
	CVEN 540	Advanced Foundation Engineering	3	
	CVEN 542	Advanced Sustainable Construction	3	
	CVEN 580	Trenchless Technology	3	
	MEMT 508	Finite Element Analysis	3	
	MEMT 511	Modern Engineering Materials	3	
	MEMT 563	Theory of Elasticity	3	
	MEMT 565	Continuum Mechanics	3	
	MEMT 577	Advanced Strength of Materials	3	
	ELEN 533	Optoelectronics	3	
	ELEN 567	Digital Communication Systems	3	
	ELEN 572	Digital Control Systems	3	
	ELEN 581	Computer Application to Power Systems	3	
	ELEN 582	Motor Control and Power Electronics	3	
	ELEN 584	Electric Machines and Power Electronics	3	
	INEN 502	Operations Research	3	
	INEN 504	Systems Simulation	3	
	INEN 514	Statistical Analysis of Six Sigma	3	
	INEN 557	Special Topics: Design for Six Sigma	3	
	STAT 507	Design and Analysis of Six Sigma	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) electives 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 Materials, Systems, and Infrastructure **MUST BE SELECTED in coordination with the research advisor.**

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 is required before a student may take their oral qualifier.

⁴ Taken under the supervision of the faculty member with only 6 credits of directed study allowed to count towards a degree. 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.

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).

Updated 4/2024