PhD Program in Industrial Engineering

Course group	ECTS total	Course code	Course name	Course type	ECTS	Pre-requisite
Required Courses	12	ENS666	Advanced Research Methodologies and Design	required	12	
Elective Courses		MATH 517	Advanced Mathematics for Engineers and Scientists		6	
		IE 501	Linear Programming and Extensions		6	
		IE 503	Stochastic Processes		6	
		IE 509	Nonlinear Programming		6	
		BAM 505	Management Information Systems		6	
		BAM 509	Operations Management		6	
		IE 512	Graph Theory and Network Flows		6	
		IE 514	Manufacturing Strategies		6	
		IE 518	Queuing Theory and Applications		6	
		IE 519	Advanced Total Quality Management		6	
		IE 522	Decision Analysis		6	
		IE 524	System Simulation		6	
		IE 525	Advanced Scheduling and Sequencing		6	
		IE 553	Facility Design and Analysis		6	
		IE 554	Supply Chain Management		6	
		IE 563	Metal Cutting Mechanics and Dynamics		6	
		IE 564	Manufacturing Automation		6	
		IE 567	Manufacturing Systems Modelling		6	
		IE 580	Special Topics in Industrial Engineering		6	
		IE 601	Optimisation Theory		6	
		CS 604	Data Mining		6	
		IE 603	Advanced Topics in Stochastic Processes		6	
		IE 606	Large Scale Optimisation		6	
		IE 610	Nonlinear System Identification		6	
		IE 618	Advanced Queuing Theory		6	
		IE 620	Organizational Structure and Design		6	
		IE 631	Fuzzy Logic Applications in Industrial Engineering		6	
		IE 641	Advanced Machine Learning		6	
		IE 642	Neural Networks		6	
		IE 654	Advanced Topics in Supply Chain Management		6	
		IE 667	Advanced Manufacturing Systems Modelling		6	
		IE 671	Advanced Derivatives		6	
		IE 680	Selected Topics in Industrial Engineering		6	
PhD Thesis		IE790	PhD Thesis		120	
total						

Graduate Studies: summary of conditions for successful completion of studies

Category	ECTS	Note:
Courses	48	Students are expected to: 1. Complete courses, that total of 48 ECTS credits. There is no required courses. Student should complete at least 36 ECTS from area (IE) elective courses. Students can obtain also at most 12 ECTS credits from other FENS elective courses level 500 or from FBA or FENS graduate courses. with the approval decision from the program coordinator. Students are obliged to complete Scientific Activities worth 12 ECTS credits. Scientific Activities include published research work, participation at the conference or equivalent each worth 6 ECTS credits.
Scientific Activity (Research Seminar)	12	
PhD thesis	120	
Total	180	

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