

Master of Science in Industrial and Human Factors Engineering (IHE)

Department of Biomedical, Industrial & Human Factors Engineering, Wright State University

Focus Areas

Decision Analytics: Provides the student with a background in both theory and application of optimization-based and dynamic systems modeling. Emphasis is placed on mathematical techniques, computer modeling, and experimental methods as they relate to the design, development and analysis of complex systems such as healthcare, transportation, airlines, and retail.

Faculty: Dr. Frank Ciarallo, Dr. Mary Fendley, Dr. Jennie Gallimore, Dr. Subhashini Ganapathy, Dr. Pratik Parikh, Dr. Xinhui Zhang

Logistics and Supply Chain: Provides the student with a background in both theory and application of systems-based modeling, manufacturing design, and continuous improvement. Emphasis is placed on inventory theory, forecasting, warehousing, and network design.

Faculty: Dr. Frank Ciarallo, Dr. Pratik Parikh, Dr. Xinhui Zhang

Human Factors and Ergonomics: Provides the student with a background in product usability, computer interface design, simulations and virtual environments, systems modeling, information retrieval, and human performance. Emphasis is placed on human-computer interaction, cognitive modeling and experimental methods as they relate to the design, development and analysis of systems such as petrochemical industries, military domain, and healthcare.

Faculty: Dr. Caroline Cao, Dr. Mary Fendley, Dr. Jennie Gallimore, Dr. Subhashini Ganapathy

Neuroengineering: Provides the student with a background in principles, computational methods, and technologies in this area. Emphasis is placed on using engineering techniques to understand, design, and analyze the neural-system interface.

Faculty: Dr. Caroline Cao, Dr. Mary Fendley, Dr. Jennie Gallimore, Dr. Subhashini Ganapathy

Degree Requirements

● 30 semester credit hours (thesis optional) ● 18 credit hours of IHE courses (6000- or 7000-level) ● minimum of 12 credit hours of 7000+-level BIE Department courses ● minimum of 6 credit hours of approved courses with math/statistics content ● BME/IHE 6010 Ethics in Engineering Research & Practice (1 cr) ● maximum of 4 credit hours of independent study/non-thesis research ● maximum of 8 credit hours of thesis research ● an approved Program of Study before 9 credit hours are earned. Additionally, full-time or part-time study, evening and distance education classes are available. Graduate teaching and research assistantships are awarded on a competitive basis for qualified students. ***The MS in IHE degree program can be completed entirely online (for eligible students).***

Prerequisite coursework: Students should expect to be prepared for their program with knowledge of topics such as calculus, calculus-based physics, statistics, computer programming, statics, dynamics, psychology, human factors engineering and/or core engineering courses, depending on the student's chosen degree and focus area.

MSIHE-Industrial & Human Factors Engineering Graduate Course Offerings at a Glance: 2016-17

Fall Courses			IHE Focus Areas				Approved math/stats	Distance option
			Decision Analytics	Logistics/ Supply Chain	Human Factors and Ergonomics	Neuro-engineering		
Course	Cr	Title						
BME 6010	1	Ethics in Engineering Research & Practice	•	•	•	•	D	
BME 6310	3	Ergonomics			•	•	D	
BME 6350	3	Computational Neuroergonomics and Healthcare Applications			•	•	D	
BME 6410	3	Biothermodynamics (not offered F16)				•		
BME 6440	4	Biomaterials				•		
BME 6550	4	Bioinstrumentation				•		
BME 6850	3	Six Sigma for Engineers	•	•	•		D	
BME 7110	3	Biomedical Signals				•	M	
BME 7210	3	Orthopaedic & Prosthetic Engineering			•	•		
BME 7370	3	Medical Devices (not offered 2016-17)			•	•		
BME 7371	3	Failure Analysis of Medical Devices			•			
IHE 6010	1	Ethics in Engineering Research & Practice	•	•	•	•	D	
IHE 6300	3	Fundamentals of Human Factors Engineering			•	•	D	
IHE 6310	3	Ergonomics			•	•	D	
IHE 6350	3	Computational Neuroergonomics and Healthcare Applications			•	•	D	
IHE 6400	3	Engineering Economy		•	•		D	
IHE 6711	4	Optimization Methods	•	•			D	
IHE 6820	3	Supply Chain Analysis & Design	•	•			D	
IHE 6850	3	Six Sigma for Engineers	•	•	•		D	
IHE 6980	4	Fundamentals of Probability & Statistics	•	•	•	•	M D	
IHE 7010	3	Understanding & Aiding Human Decision Making	•		•		D	
IHE 7340	3	HFE in Mobile Computing			•			
IHE 7360	3	Cognitive Systems Engineering			•	•	D	
IHE 7370	3	Medical Devices (not offered 2016-17)			•	•		
IHE 7430	3	Manual Control (cross-listed with PSY 9020; next offered F18)			•	•		
IHE 7510	3	Data Mining	•	•	•		M D	
IHE 7810	3	Engineering Health Systems	•		•			
EGR 7050	3	Design & Analysis of Engineering Experiments	•	•	•	•	M D	
Spring Courses			IHE Focus Areas				Approved math/stats	Distance option
			Decision Analytics	Logistics/ Supply Chain	Human Factors and Ergonomics	Neuro-engineering		
Course	Cr	Title						
BME 6010	1	Ethics in Engineering Research & Practice	•	•	•	•	D	
BME 6421	3	Biotransport				•	D	
BME 7112	3	Processing of Medical Images				•		
BME 7220	3	Experimental Orthopaedic Engineering				•		
BME 7310	3	Advanced Ergonomics			•	•	D	
BME 7380	3	From Neurons to Behavior in Health and Disease				•		
BME 7850	3	Lean Process Improvement for Engineers		•	•		D	
IHE 6010	1	Ethics in Engineering Research & Practice	•	•	•	•	D	
IHE 6320	3	Human-System Interaction & Usability Engineering	•		•		D	
IHE 6410	3	Technology-Based Ventures		•			D	
IHE 6420	1	Innovation & Entrepreneurship Seminar Series		•	•		D	
IHE 6510	4	Computer Applications in IHE	•	•	•			
IHE 6712	4	Simulation & Stochastic Models	•	•			D	
IHE 6810	3	Production & Service Systems Analysis	•	•			D	
IHE 6980	4	Fundamentals of Probability & Statistics	•	•	•	•	M D	
IHE 7300	3	Research Methods in HFE (also offered F16)			•	•	M D	
IHE 7310	3	Advanced Ergonomics			•	•	D	
IHE 7711	3	Integer Optimization and Heuristics	•	•			M D	
IHE 7712	3	Discrete Event Modeling and Analysis	•	•			D	
IHE 7713	3	Stochastic Models for Engineers (even)	•	•			D	
IHE 7820	3	Engineering Supply Chain Systems (odd)	•	•			D	
IHE 7850	3	Lean Process Improvement for Engineers		•	•		D	
IHE 7980	3	Analysis and Design of Human-Machine Systems for Cyber Security	•		•			
EGR 7020	3	Systems Engineering & Analysis (also offered F16)	•	•	•	•	D	
Summer Courses								
BME/IHE 6850	3	Six Sigma for Engineers	•	•	•		D	
IHE 7980	3	Simulation Analysis Using Multi-Modal Models	•	•				
Other Department Courses								
P&N 6420	3	Introductory Neuroscience (fall/spring)				•		

KEY: • = suggested focus area course; M = approved math/stats course; D = available via distance education