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

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

MSIHE Focus Areas

Systems Modeling: For students interested in industrial engineering, operations research, and systems modeling. Provides the student with a background in both theory and application of optimization-based and dynamic systems modeling. Emphasis is placed on mathematical modeling, computer modeling, and experimental methods as they relate to the design, development and analysis of systems.
Advisors: Dr. Frank Ciarallo, Dr. Mary Fendley, Dr. Subhashini Ganapathy, Dr. Pratik Parikh, Dr. Xinhui Zhang

Logistics and Supply Chain: For students interested in industrial engineering, logistics planning or supply chain operations. Provides the student with a background in both theory and application of systems based modeling, manufacturing design and continuous improvement.
Advisors: Dr. Frank Ciarallo, Dr. Pratik Parikh, Dr. Xinhui Zhang

Human-System Integration: For students interested in such areas as product usability, computer interface design, systems modeling and information retrieval. Emphasis is placed on human-computer interaction, cognitive modeling and experimental methods as they relate to the design, development and analysis of systems. *Advisors: Dr. Caroline Cao, Dr. Mary Fendley, Dr. Subhashini Ganapathy*

Ergonomic Engineering: For students interested in industrial ergonomics and human engineering. Provides the student with a background in ergonomics, biomechanics and human modeling with respect to industrial and health care environments. *Advisors: Dr. Caroline Cao*

Neuroengineering: For students interested in neuroergonomics and human engineering. Provides courses related to principles, computational methods and technologies in the area of neuroengineering. Emphasis is placed on using engineering techniques to understand, design, and analyze the neural-system interface. *Advisors: Dr. Caroline Cao, Dr. Mary Fendley, Dr. Subhashini Ganapathy*

MSIHE Degree Requirements

● 30 semester credit hours (thesis optional) ● 18 credit hours of IHE courses (6000- or 7000-level) ● 15 credit hours of 7000+-level BIE Department courses ● 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. Students can combine focus areas to customize a program of study to suit individual interests. Additionally, full-time or part-time study, evening and distance education classes are available. Funding is 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.

Biomedical, Industrial & Human Factors Engineering Graduate Course Offerings at a Glance: 2015-16

Fall Courses			IHE Focus Areas						
			Systems Modeling	Logistics/ Supply Chain	Human-System Integration	Ergonomic Engineering	Neuro-engineering	Approved math/stats	Distance option
Course	Cr	Title							
BME 6010	1	Ethics in Engineering Research & Practice	●	●	●	●	●		D
BME 6310	3	Ergonomics			●	●	●		D
BME 6410	3	Biothermodynamics					●		
BME 6550	4	Bioinstrumentation					●		
BME 6701	4	Medical Imaging							
BME 6850	3	Six Sigma for Engineers	●	●		●			D
BME 7110	3	Biomedical Signals					●	M	
BME 7133	3	Nuclear Magnetic Resonance in Medicine (odd)							
BME 7210	3	Orthopaedic & Prosthetic Engineering			●	●	●		
BME 7315	3	Ergonomic Engineering (odd)			●	●	●		
BME 7330	3	Neuromuscular Engineering (even)			●	●	●		
BME 7980	3	Failure Analysis of Medical Devices			●	●			
IHE 6010	1	Ethics in Engineering Research & Practice	●	●	●	●	●		D
IHE 6120	3	Probability for Engineers	●	●	●	●	●	M	D
IHE 6300	3	Fundamentals of Human Factors Engineering	●	●	●	●	●		D
IHE 6310	3	Ergonomics			●	●	●		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	3	Computational Neuroergonomics and Healthcare Applications			●	●	●		D
IHE 7300	3	Research Methods in HFE (not offered F15)			●	●	●	M	D
IHE 7315	3	Ergonomic Engineering (odd)			●	●	●		
IHE 7340	3	HFE in Mobile Computing	●		●	●			
IHE 7510	3	Data Mining	●	●	●			M	D
IHE 7810	3	Engineering Health Systems	●		●				
IHE 7980	3	Manual Control (IHE 7430 as of F16; cross-listed with PSY 9020)			●	●	●		
EGR 7050	3	Design & Analysis of Engineering Experiments	●	●	●	●	●	M	D

Spring Courses			IHE Focus Areas						
			Systems Modeling	Logistics/ Supply Chain	Human-System Integration	Ergonomic Engineering	Neuro-engineering	Approved math/stats	Distance option
Course	Cr	Title							
BME 6010	1	Ethics in Engineering Research & Practice	●	●	●	●	●		D
BME 6421	3	Biotransport					●		
BME 6422	4	Advanced Biotransport & Artificial Internal Organs							
BME 6440	4	Biomaterials					●		
BME 6702	3	Advanced Medical Imaging							
BME 7111	3	Advanced Biomedical Signals (odd)					●		
BME 7112	3	Processing of Medical Images					●		
BME 7113	3	Medical Image Analysis (cross-listed with CEG 7590)							D
BME 7131	3	Medical Ultrasonics (even)							
BME 7132	3	Computed Tomography							
BME 7135	3	Photon Emission Imaging (odd)							
BME 7220	3	Experimental Orthopaedic Engineering			●	●	●		
BME 7310	3	Advanced Ergonomics			●	●	●		D
BME 7331	3	Quantitative Workload Analysis			●	●			
BME 7350	3	Human Control Engineering			●	●	●		
BME 7370	3	Medical Devices			●	●	●		
BME 7850	3	Lean Process Improvement for Engineers		●		●			D
BME 7980	3	Biomedical Optics							
BME 7980	3	From Neurons to Behavior in Health and Disease			●		●		
IHE 6010	1	Ethics in Engineering Research & Practice	●	●	●	●	●		D
IHE 6130	3	Statistics for Engineers	●	●	●	●	●	M	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	●	●					D
IHE 6712	4	Simulation & Stochastic Models	●	●					D
IHE 6810	3	Production & Service Systems Analysis	●	●					D
IHE 7010	3	Understanding & Aiding Human Decision Making	●		●				D
IHE 7300	3	Research Methods in HFE (offered S16; usually taught in fall)			●	●	●	M	D
IHE 7310	3	Advanced Ergonomics			●	●	●		D
IHE 7331	3	Quantitative Workload Analysis			●	●			
IHE 7360	3	Cognitive Systems Engineering			●	●	●		D
IHE 7370	3	Medical Devices			●	●	●		
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; but not offered S16)	●	●					D
IHE 7820	3	Engineering Supply Chain Systems (odd; but offered S16)	●	●					D
IHE 7850	3	Lean Process Improvement for Engineers		●		●			D
IHE 7980	3	Human Issues in Information Security			●				
EGR 7020	3	Systems Engineering & Analysis	●	●	●	●	●		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