

<b>Focus Areas</b>
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**Data Science:** Provides the student with a background in both theory and application of data science and to engage in the design of artificial intelligence systems and visualization of data, providing a critical understanding of the role that humans play through the data processing pipeline. Areas of interest include artificial intelligence, machine learning applications, healthcare, and retail analytics.

*Advising faculty: Dr. Caroline Cao, Dr. Subhashini Ganapathy, Dr. Robert A. Myers, Dr. Vic Middleton*

**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.

*Advising faculty: Dr. Caroline Cao, Dr. Subhashini Ganapathy*

**Innovation and Entrepreneurship:** Provides students with knowledge about the technical processes that drive innovation and the business skills required of entrepreneurs, specifically with application in the area of industrial and systems engineering. Designed to enhance the technical expertise and business acumen of students.

*Advising faculty: Dr. Subhashini Ganapathy*

**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.

*Advising faculty: Dr. Subhashini Ganapathy, Dr. Robert A. Myers*

<b>Focus Area Required Courses</b>	Sem	Cr Hr
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<b>Data Science</b>			
IHE 6150**	Probability & Statistics (m)	F	3
IHE 6711	Optimization Methods (m)	F	3
IHE 6712	Simulation & Stochastic Models (m)	S	4
IHE 7510	Data Mining	F	3
			<b>13</b>

<b>Human Factors and Ergonomics</b>			
IHE 6150**	Probability & Statistics (m)	F	3
IHE 6300	Fundamentals of HFE	F	3
IHE 6320	Human System Interaction & Usability Egr	S	3
IHE 7010	Understanding & Aiding Human Dec Making	S	3
IHE 7360	Cognitive Systems Engineering (not offered S22)	S	3
			<b>15</b>

<b>Innovation &amp; Entrepreneurship</b>			
IHE 6150**	Probability & Statistics (m)	F	3
IHE 6400	Engineering Economy	F	3
EC 7280*	Economics of Innovation*	R	3
MBA 7600	Marketing Strategy	F/S/R	3
MKT 7300*	Entrepreneurship*	R/F	3
			<b>15</b>

<b>Logistics &amp; Supply Chain</b>			
IHE 6150**	Probability & Statistics (m)	F	3
IHE 6711	Optimization Methods (m)	F	3
IHE 6712	Sim & Stoch Models (m)	S	4
IHE 6810 OR IHE 6820	Production & Service Systems OR Supply Chain Analysis & Design	F S	3
IHE 7820	Egr Supply Chain Systems	S	3
			<b>16</b>

<b>Electives</b>	Sem	Cr Hr
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<b>Math or Stats Intensive Courses (6 cr required)</b>		
IHE 6150**	Probability & Statistics	F 3
IHE 6711	Optimization Methods	F 3
IHE 6712	Simulation & Stochastic Models	S 4
IHE 7300	Research Methods in HFE	S 3
IHE 7050	Design & Analysis of Engineering Experiments	F 3
MTH / STT / CS	As approved by advisor	F/S 3

<b>Other Electives</b>		
BME 7112*	Processing of Medical Images*	S 3
IHE 6310	Ergonomics	F 3
IHE 6350	Computational Neuroergonomics	F 3
IHE 6400	Engineering Economy	F 3
IHE 6510	Computer Applications in IHE	S 3
IHE 6850	Six Sigma for Engineers	F 3
IHE 7010	Understanding & Aiding Human Dec Making	S 3
IHE 7020	Systems Engineering & Analysis	S 3
IHE 7340	HFE in Mobile Computing	F or R 3
IHE 7360	Cognitive Systems Engineering (not offered S22)	S 3
IHE 7370	Medical Devices	F 3
IHE 7712	Adv Model-Based Approaches for Systems Analysis	S 3
IHE 7810	Engineering Health Systems (not currently offered)	TBA 3
IHE 7820	Egr Supply Chain Systems	S 3
IHE 7850	Lean Process Improvement for Engineers	S 3
IHE 7980	Special Topics	TBA 3
IHE 6990/7990	Independent Study in IHE	F/S/R 1-4
Or as approved by the advisor		

\* = not offered online

\*\* = effective Fall 2020, students who completed ISE 3221 may not take IHE 6150.

(m) = Math or Stat intensive Course

<b>MSIHE program of study requirements (all focus areas):</b>
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30 credit hours total	6 credits math/stat-intensive coursework
18 credits IHE specific coursework (6000- or 7000-level)	4 credits max. independent study
12 credits 7000-level coursework, 9 cr of which must be BIE Dept courses	8 credits max. thesis

**The MSIHE program can be completed entirely online (for eligible students).**