### Focus Areas

**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*

**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*

### Focus Area Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Sem.</th>
<th>Cr.</th>
<th>Hr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>IHE 6150</td>
<td>Probability &amp; Statistics (m)</td>
<td>F</td>
<td>3</td>
<td>16</td>
</tr>
<tr>
<td>IHE 6300 OR</td>
<td>Fundamentals of HFE OR</td>
<td>F</td>
<td>3</td>
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<tr>
<td>IHE 6320 OR</td>
<td>Human-Syst Interaction &amp; Design Thinking OR</td>
<td>S</td>
<td>3</td>
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<tr>
<td>IHE 7300</td>
<td>Research Methods in HFE (m)</td>
<td>S</td>
<td>3</td>
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<tr>
<td>IHE 6711</td>
<td>Optimization Methods</td>
<td>F</td>
<td>3</td>
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<tr>
<td>IHE 6712</td>
<td>Simulation &amp; Stochastic Models (m)</td>
<td>S</td>
<td>4</td>
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</tr>
<tr>
<td>IHE 7510</td>
<td>Data Mining</td>
<td>F</td>
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### Electives

<table>
<thead>
<tr>
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<th>Cr.</th>
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<tbody>
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<td>IHE 6711</td>
<td>Optimization Methods</td>
<td>F</td>
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<tr>
<td>IHE 6712</td>
<td>Simulation &amp; Stochastic Models</td>
<td>S</td>
<td>4</td>
</tr>
<tr>
<td>IHE 7300</td>
<td>Research Methods in HFE</td>
<td>S</td>
<td>3</td>
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<tr>
<td>IHE 7050</td>
<td>Design &amp; Analysis of Engineering Experiments</td>
<td>F</td>
<td>3</td>
</tr>
<tr>
<td>IHE 7712</td>
<td>Adv Model-Based Approaches for Systems Analysis</td>
<td>S</td>
<td>3</td>
</tr>
<tr>
<td>MTH / STT / CS</td>
<td>As approved by advisor</td>
<td>F/S</td>
<td>3</td>
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</table>

### Math or Stats Intensive Courses (6 cr required)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Sem.</th>
<th>Cr.</th>
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</thead>
<tbody>
<tr>
<td>IHE 6150</td>
<td>Probability &amp; Statistics</td>
<td>F</td>
<td>3</td>
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<tr>
<td>IHE 6711</td>
<td>Optimization Methods</td>
<td>F</td>
<td>3</td>
</tr>
<tr>
<td>IHE 6712</td>
<td>Simulation &amp; Stochastic Models</td>
<td>S</td>
<td>4</td>
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<td>Research Methods in HFE</td>
<td>S</td>
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<tr>
<td>IHE 7050</td>
<td>Design &amp; Analysis of Engineering Experiments</td>
<td>F</td>
<td>3</td>
</tr>
<tr>
<td>IHE 7712</td>
<td>Adv Model-Based Approaches for Systems Analysis</td>
<td>S</td>
<td>3</td>
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</table>

### Other Electives

<table>
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<th>Course Code</th>
<th>Course Title</th>
<th>Sem.</th>
<th>Cr.</th>
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<tbody>
<tr>
<td>IHE 6310</td>
<td>Ergonomics</td>
<td>F</td>
<td>3</td>
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<tr>
<td>IHE 6350</td>
<td>Computational Neuroergonomics</td>
<td>TBA</td>
<td>3</td>
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<tr>
<td>IHE 6400</td>
<td>Engineering Economy</td>
<td>F</td>
<td>3</td>
</tr>
<tr>
<td>IHE 6510</td>
<td>Computer Applications in IHE</td>
<td>S</td>
<td>3</td>
</tr>
<tr>
<td>IHE 6830</td>
<td>Engineering Project Management and Applications</td>
<td>R</td>
<td>3</td>
</tr>
<tr>
<td>IHE 6850</td>
<td>Six Sigma for Engineers</td>
<td>F</td>
<td>3</td>
</tr>
<tr>
<td>IHE 7010</td>
<td>Understanding &amp; Aiding Human Dec Making</td>
<td>S</td>
<td>3</td>
</tr>
<tr>
<td>IHE 7020</td>
<td>Systems Engineering &amp; Analysis</td>
<td>S</td>
<td>3</td>
</tr>
<tr>
<td>IHE 7340</td>
<td>HFE in Mobile Computing</td>
<td>F or R</td>
<td>3</td>
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<tr>
<td>IHE 7360</td>
<td>Cognitive Systems Engineering</td>
<td>TBA</td>
<td>3</td>
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<tr>
<td>IHE 7370</td>
<td>Medical Devices</td>
<td>F</td>
<td>3</td>
</tr>
<tr>
<td>IHE 7510</td>
<td>Data Mining</td>
<td>F</td>
<td>3</td>
</tr>
<tr>
<td>IHE 7810</td>
<td>Engineering Health Systems</td>
<td>TBA</td>
<td>3</td>
</tr>
<tr>
<td>IHE 7820</td>
<td>Egr Supply Chain Systems (not taught in F22)</td>
<td>F</td>
<td>3</td>
</tr>
<tr>
<td>IHE 7850</td>
<td>Lean Process Improvement for Engineers</td>
<td>S</td>
<td>3</td>
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<tr>
<td>IHE 7980</td>
<td>Special Topics</td>
<td>TBA</td>
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<tr>
<td>IHE 6990/7990</td>
<td>Independent Study in IHE</td>
<td>F/S/R</td>
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</tbody>
</table>

### MSIHE program of study requirements (all focus areas):

- **30 credit hours total:**
  - 18 credits IHE specific coursework (6000- or 7000-level)
  - 12 credits 7000-level coursework, 9 cr of which must be BIE Dept courses
  - 6 credits math/stat-intensive coursework
  - 4 credits max. independent study; 8 credits max. thesis

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