### IE Graduate Program Course Schedule

http://www.montana.edu/wwwcat/courses/i-me.html  
January, 2012

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<tr>
<th>Fall Semester</th>
<th>Spring Semester</th>
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<td><strong>Even Calendar Year</strong></td>
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| **EIND 513 HUMAN FACTORS IN SAFETY OF COMPLEX SYSTEMS**  
Advanced topics and methods in ergonomics and human factors engineering as applied to human error and safety in complex systems. Basic and applied issues of human error and safety are explored through seminars, laboratory demonstrations and case studies. | **EIND 514 – OCCUPATIONAL BIOMECHANICS**  
Topics related to occupational biomechanics, focused on designing for the health and safety at work. Topics include the skeletal system, physiology, fatigue assessment in shift work, environmental noise and vibration, stress response, psychometrics, biomechanics, bioinstrumentation, work design assessments and implementation of ergonomics programs. |
| **EIND 525 MULTI-ATTRIBUTE ANALYSIS OF ADVANCED MANUFACTURING AND SERVICE SYSTEMS**  
Theory, methods, and applications pertinent to decision making with multiple attributes and/or multiple objectives. Special emphasis is given to multi-attribute utility theory, goal programming, and multiple criteria optimization decision-making in modern manufacturing and service systems and in design decision-making to support competitive priorities of an enterprise. | **EIND 455 / 555 EXPERIMENTAL DESIGN FOR ENGINEERS**  
Advanced topics in statistical experiments as applied to engineering decision making. Factorial designs, including fractional replication, blocking and confounding, random factors experiments, and introductions to response surface modeling, nested and split-plot designs. Includes computer exercises and course capstone project. |
| **EIND 574 MANAGEMENT ENGINEERING SYSTEMS**  
Students will explore various facets of designing effective organizational and management systems. Topics will include: classical and open system organization theory, socio-technical systems theory, congruence, technology and innovation management, knowledge management, and continuous improvement in organizations. Students will complete an independent research project in addition to course readings and in-class discussion. | |
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<td><strong>EIND 509 SYSTEMS SIMULATION</strong></td>
<td><strong>EIND 506 DESIGN OF HEALTH CARE DELIVERY SYSTEMS</strong></td>
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<td>Systems exhibiting randomness are modeled and statistically analyzed using a state-of-the-art simulation language. Graphical model animation, and advanced output analysis are emphasized. Applications include improvement of existing and design of new production and service systems.</td>
<td>This course introduces the role of Industrial (or systems) Engineer (IE) in healthcare. It examines the major systems within healthcare organizations which affect care delivery, and provide experience and tools for working effectively in interdisciplinary teams to redesign healthcare delivery systems. This interdisciplinary course targets nursing students pursuing certification as a Clinical Nurse Leader and Industrial Engineering students who intend to work in the healthcare sector. Students will learn strategies for analyzing and improving processes, coordinating interdisciplinary healthcare teams, enhancing healthcare quality management, and reducing health risk through medical error elimination.</td>
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<td><strong>EIND 510 USABILITY ENGINEERING</strong></td>
<td><strong>EIND 511 ADVANCED METHODS IN HUMAN FACTORS AND ERGONOMICS</strong></td>
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<td>In supporting the design process, usability engineering uses a variety of usability engineering tools to assess user needs, refine design concepts, select design alternatives, and evaluate the final design at the level of the target users.</td>
<td>This course will cover advanced research methods applied to areas where ergonomics and human factors is playing a key role in increasing effectiveness, efficiency and safety of human-based systems. Example application areas include: (1) transportation systems; (2) health care systems; and (3) occupational work. The students will also learn how to utilize statistical software (SAS) to conduct statistical analysis and the management of large datasets.</td>
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<td><strong>EIND 457 / 557 REGRESSION AND APPLIED MULTIVARIATE ANALYSIS</strong></td>
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<td>Simple and Multiple Regression, including variable selection procedures; detection and effects of multi-collinearity; identification and effects of influential observations; residual analysis; and use of transformations. Time series analysis techniques. Introduction to advanced multivariate techniques including principal components, canonical correlation, cluster and factor analysis. Includes computer exercises and course capstone project.</td>
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