Bachelor of Science in Industrial Engineering/
Master of Engineering in Engineering Management
Dual Degree Program

Graduate Manual

Effective for Students Enrolling on or after Fall, 2013

Industrial and Systems Engineering Department
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(Revised September 1, 2012)
1. Bachelor of Science in Industrial Engineering/Master of Engineering in Engineering Management Dual Degree Program

The Master of Engineering in Engineering Management program uses a blend of ISE courses and courses from the College of Business to focus on the management of the engineering and technological enterprise. It combines technological expertise with managerial skills.

Engineering Management is concerned with understanding the technology involved in an engineering project and the management process through which the technology is applied. This concentration deals with the dual role of the engineering manager; both as a technologist and a manager. The object is to provide a background in areas commonly needed in this role, such as organizational behavior, finance, and accounting, in addition to industrial engineering expertise. Each student should develop a program of study in conjunction with their advisor, that contains courses with business management content to complement the engineering course work.

The dual Bachelor and Master degree programs allow students to complete their B.S. and M.E. degrees in an accelerated manner. This dual degree program offers a unique opportunity for outstanding undergraduate students to pursue. The combination of these programs provides a synergy that allows students to apply their learning between programs.

2. Admission Requirements

This combined degree offerings are only available for students who are currently matriculated in the undergraduate BSIE program. Students enrolled in the dual degree program must complete all of the dual degree program requirements before receiving either of the two degrees. Advanced planning is required to complete the dual degree program in required time limit. In particular, students will typically begin their first co-op assignment in the summer following their second year of study. In addition, the co-op requirement for the dual degree is reduced to a minimum of 40 weeks, which will typically be accomplished through taking one co-op block during a semester of the third year and three co-op blocks during the summer following the second, third, and fourth years. Finally, the dual degree will allow for the “double-counting” of up to 3 professional elective courses (9 units) at 700-level or above toward both degree programs.

During the first two years, the BS curriculum is followed. The tem-by-term sequence of required courses for this degree program is shown in Table 1. Although the program can be completed in 5 years, students typically take one or two additional semesters to complete the program requirements.

2.1 Time Limits for Completion of BS/ME Degree Requirements

Students admitted to the BS/ME dual degree programs are required to complete all requirements for both degrees by the end of the spring semester of Year 6.
If it is anticipated that the dual degree requirements will not be met by the end of the spring semester of Year 6, the student has the following options:

- The student can be certified with the BS degree.
- The student can be certified with the BS degree and apply for formal admission to the MS or ME programs. (Acceptance is not guaranteed and if accepted additional coursework will be required.)
- The student can apply for a one-term extension (Summer of Year 6) in which the student should submit to the Graduate Program Director the following items prior by the end of the fall semester in Year 6:
  1. Student letter requesting extension of the BS/ME degree completion that states the reasons for not completing degree for certification in the spring of Year 6; and
  2. Timetable for completion of the degree requirements.

The Graduate Program Director and the ISE Department Head will meet with the student's advisor and will decide whether an extension will be granted. There will be no consideration for extensions beyond summer of Year 6 except for circumstances that are CLEARLY beyond the student's control, such as a medical emergency or hospitalization, and when it is clear that a BRIEF (not to exceed one semester) extension will allow the student to complete both degrees.

3. **BSIE/MEEM Admission / Curriculum / Graduation Requirements**

Students should apply to this combined program during their 3rd year. Decisions with regard to admission to the BS/ME program will be based on the following: a minimum 3.0/4.0 cumulative GPA and an interview with the ISE Department Head. There will be no exceptions for late admittance after the fall semester of the 4th year. A 3.0/4.0 cumulative GPA must be maintained throughout the program. **There is a strict 6-year limit for the full completion of the BS/ME program which begins the first semester that the student is enrolled at RIT.**

3.1 **BS/ME Advisor**

The ISE undergraduate advisor or the Master of Engineering program advisor will serve as the student’s advisor for the ME portion of the dual degree program including approval of the ME plan of study. The student's undergraduate advisor for the BS degree will continue to serve as the student’s advisor for the undergraduate degree requirements.

3.2 **BS/ME Program Descriptions and Plan of Study**

Prior to taking any courses that the student plans to count toward the ME degree and no later than the end of the Fall semester of the 4th year, the student's Plan of Study must be mapped out with and approved by the advisor using the appropriate plan of study form in the Appendix. An approved plan of study must be submitted to the ISE Department.
3.2.1 BSIE/ME in Engineering Management (EM) Plan of Study

The BSIE/ME in Engineering Management uses a blend of ISE courses and courses from the College of Business to focus on the management of the engineering and technological enterprise. A sample plan of study for the BSIE/ME in Engineering Management is shown in Table 1.

The BS/ME program counts 9 units towards both the BS and ME programs (i.e., 'double-count') and requires 153 units. Thus, for the BSIE/ME EM degree the student must:

- Perform at least 4 co-op blocks totaling a minimum of 40 weeks
- Complete all required coursework for BS degree
- Complete the following coursework for ME degree:

**Required Courses:**
- ISEE-750 Systems & Project Management
- ISEE-760 Design of Experiments
- ISEE-771 Engineering of Systems I
- ACCT-703 Accounting for Decision Makers or ACCT-706 Cost Management

**Select 3 Elective Engineering Management Courses:**
- ISEE-703 Supply Chain Management
- ISEE-704 Logistics Management
- ISEE-720 Production Control
- ISEE-728 Production Systems Management
- ISEE-751 Decision and Risk Benefit Analysis
- ISEE-752 Decision Analysis
- ISEE-772 Engineering of Systems II
- ACCT-703 Accounting for Decision Makers
- ACCT-706 Cost Management
- ACCT-794 Cost Management in Technical Organizations
- MGMT-710 Managing for Environmental Sustainability
- MGMT-720 Entrepreneurship and New Venture Creation
- MGMT-740 Organizational Behavior and Leadership
- MGMT-741 Managing Organizational Change
- MGMT-742 Technology Management
- FINC-721 Financial Analysis for Managers
- MKTG-761 Marketing Concepts and Commercialization
- MKTG-771 Customer Satisfaction Research Methods
- MGIS-755 Information Technology Strategy and Management
- MGIS-760 Integrated Business Systems
- INTB-730 Cross-Cultural Management
Select 3 Elective Technical Engineering Courses

- ISEE-626 Contemporary Production Systems
- ISEE-701 Linear Programming
- ISEE-702 Integer and Nonlinear Programming
- ISEE-704 Logistics Management
- ISEE-711 Advanced Simulation
- ISEE-720 Production Control
- ISEE-728 Production Systems Management
- ISEE-730 Biomechanics
- ISEE-731 Advanced Topics in Human Factors and Ergonomics
- ISEE-732 Systems Safety Engineering
- ISEE-740 Design for Manufacture and Assembly
- ISEE-741 Rapid Prototyping and Manufacturing
- ISEE-752 Decision Analysis
- ISEE-760 Design of Experiments
- ISEE-772 Engineering of Systems II
- ISEE-775 Advanced Systems Integration
- ISEE-785 Fundamentals of Sustainable Engineering
- ISEE-786 Lifecycle Assessment
- ISEE-787 Design for the Environment
- CQAS-721 Theory of Statistics I
- CQAS-722 Theory of Statistics II
- CQAS-747 Principles of Statistical Data Mining
- CQAS-751 Nonparametric Statistics
- CQAS-756 Multivariate Analysis
- CQAS-762 SAS Database Programming
- CQAS-773 Time Series Analysis and Forecasting
- CQAS-775 Design and Analysis of Clinical Trials
- CQAS-784 Categorical Data Analysis
- ISTE-608 Database Design and Implementation

- **Complete capstone and final three units of degree by either:**
  - Serving as a project leader for a multidisciplinary senior design team for two semesters with a grade requirement of B or better in both Multidisciplinary Senior Design I and II, and
    - Register for ISEE-791 Leadership Capstone (0 credit),
    - Take one additional graduate level course (700-level or above),
    - Students are encouraged to take ISEE-770 Design Project Leadership for preparation as a project leader
    - Students are strongly advised to take MDS I & II during their final year to have the potential to integrate and apply their graduate course content
  - or
  - Successfully complete the three-unit capstone course (ISEE-792 Engineering Capstone)
### Table 1. Sample plan of study for BS/ME Engineering Management program

<table>
<thead>
<tr>
<th>Fall 1</th>
<th>Spring 1</th>
<th>Summer 1</th>
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</thead>
<tbody>
<tr>
<td>First-Year Seminar</td>
<td>ISEE-140 Materials Processing</td>
<td>Vacation</td>
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<tr>
<td>ISEE-120 Fundamentals of IE</td>
<td>MATH-182 Project-based Calculus II</td>
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<tr>
<td>CHMG-131 General Chemistry for Engineers</td>
<td>PHYS-211 University Physics I</td>
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<tr>
<td>MATH-181 Project-based Calculus I</td>
<td>Writing Course</td>
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<td>University Arts &amp; Science Perspectives (1)</td>
<td>University Arts &amp; Science Perspectives (2)</td>
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<td>ISEE-200 Computing for Engineers</td>
<td>Spring 2</td>
<td>Summer 2</td>
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<tr>
<td>MATH-221 Multivariable Calculus</td>
<td>MECE-200 Fundamentals of Mechanics</td>
<td>CO-OP</td>
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<tr>
<td>PHYS-212 University Physics II</td>
<td>MATH-233 Linear Systems and Diff Eq</td>
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<tr>
<td>CQAS-251 Prob &amp; Stats for Engineers I</td>
<td>CQAS-252 Prob &amp; Stats for Engineers II</td>
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<tr>
<td>University Arts &amp; Science Perspectives (3)</td>
<td>ISEE-250 Engineering Economy</td>
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<td>ISEE-250 Engineering Economy</td>
<td>University Arts &amp; Science Perspectives (4)</td>
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<td>Fall 2</td>
<td>Fall 3</td>
<td>Summer 3</td>
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<td>ISEE-420 Production Control</td>
<td>Professional Elective (2)</td>
<td>CO-OP</td>
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<tr>
<td>ISEE-460 Statistical Quality Control</td>
<td>Professional Elective (3)</td>
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<td>ISEE-410 Simulation</td>
<td>ISEE-760 Design of Experiments</td>
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<td>ISEE-421 D/A Production Systems</td>
<td>University Arts &amp; Science Concentration (1)</td>
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<tr>
<td>Professional Elective (1)</td>
<td>University Arts &amp; Science Concentration (2)</td>
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<td>Free Elective (1)</td>
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<td>Fall 4</td>
<td>Spring 4</td>
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<tr>
<td>ISEE-591 Senior Design II</td>
<td>Professional Elective (2)</td>
<td>CO-OP</td>
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<tr>
<td>ISEE-561 Linear Regression Analysis</td>
<td>Professional Elective (3)</td>
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<tr>
<td>ISEE-771 Engineering of Systems I</td>
<td>ISEE-760 Design of Experiments</td>
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<td>ISEE-750 Systems &amp; Project Management</td>
<td>University Arts &amp; Science Concentration (1)</td>
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<tr>
<td>ACCT-703 Accounting for Decision Makers or ACCT-706 Cost Management</td>
<td>ISEE-XXX/SCB-YYYY-XXX Engineering Management Elective</td>
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<td>ISEE-XXX/SCB-YYYY-XXX Engineering Management Elective</td>
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BS and ME degrees in industrial engineering will be awarded upon successful completion of the approved undergraduate program consisting of 129 units and graduate program consisting of a minimum of 33 units including an engineering capstone course. As indicated above, 9 units would be counted towards both the BS and ME programs (i.e., 'double-counted').
Bachelor of Science in Industrial Engineering/
Master of Engineering in Engineering Management (BSIE/MEEM)
Graduate Student Plan of Study

Name: ________________________________   RIT ID#: ______________________
Address: ___________________________   Ph(w): ________________________
___________________________   Ph(h): ________________________
___________________________   Email: ________________________
Employer: ___________________________
Entry Term: ____________________    6-Year Limit: _____________

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<th>Course</th>
<th>PE**</th>
<th>Semester</th>
<th>Grade</th>
<th>Hrs.</th>
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<tr>
<td>2. ISEE-750 Systems &amp; Project Management</td>
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<td>3. ACCT-703 Accounting for Decision Makers</td>
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<td>or ACCT-706 Cost Management</td>
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<td>4. ISEE-760 Design of Experiments</td>
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<td>5. ISEE/SCB Engineering Management Elective</td>
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<td>6. ISEE/SCB Engineering Management Elective</td>
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<td>7. ISEE/SCB Engineering Management Elective</td>
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<td>9. Engineering Elective</td>
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<td>10. Engineering Elective</td>
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<td>11. ISEE-792 Engineering Capstone</td>
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** Total 33 **

Advisor: ___________________    Signature: ___________________    Date: ________
Completion Date: ______________

* Course not required to fulfill degree requirements
Ending GPA: ____________
** Indicate with an “X” if this course also counts as a PE for the BSIE degree (Up to 3 courses).