Boise State University
Foundational Studies Program Course Application Form
Due to the Foundational Studies Program by August 19, 2011

After the Foundational Studies Program has approved a course, departments will continue through the regular department and college procedures. The approved course should be submitted to the University Curriculum Committee by October 1, 2011.

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Instructions:

1. Complete one form per course.
2. Attach this Foundational Studies Course Application Form to the back of the University Curriculum Committee “Request for Curriculum Action” form. Both forms should be submitted to the Foundational Studies Program Office by August 19, 2011.

Part I. Course Information:

Course Number and Title: ME 481 Senior Design Project I

Type of Foundational Studies Course – (Choose One):
[ ] DLS (Disciplinary Lens – Social Science)
[ ] DLL (Disciplinary Lens – Literature and Humanities)
[ ] DLV (Disciplinary Lens – Visual and Performing Arts)
[ ] DLM (Disciplinary Lens – Mathematics)
[ ] DLN (Disciplinary Lens – Natural, Physical, and Applied Sciences)
  Includes Lab: [ ] Yes [ ] No
[ ] CID (Communication in the Discipline)
[x] FF (Finishing Foundations)

Delivery Format(s) – (Check all that apply):
[x] Face to Face
[ ] Fully Online
[ ] Hybrid
[ ] Concurrent Enrollment
[ ] Other (briefly describe):
Part II. Syllabus Statement:

In the space below, include the syllabus statement for this course which will appear on the first page of the syllabus for each section of this course. (Template and examples are appended to this application form.)

Boise State's Foundational Studies Program provides undergraduates with a broad-based education that spans the entire university experience. ME 481 provides 2 credits of the Foundational Studies Program “Communication in Discipline” (CID) requirements. It supports the following University Learning Outcomes (ULO), along with a variety of other course-specific goals.

• ULO - 1. Write effectively in multiple contexts, for a variety of audiences.
• ULO - 2. Communicate effectively in speech, both as speaker and listener.
• ULO - 3. Engage in effective critical inquiry by defining problems, gathering and evaluating evidence, and determining the adequacy of argumentative discourse.
• ULO - 4. Think creatively about complex problems in order to produce, evaluate, and implement innovative possible solutions, often as one member of a team.

Course Description:
ME 481 SENIOR DESIGN PROJECT I (2-3-3)(F). First course for mechanical engineers in capstone design. Integration of previous course work with modern design theory, methodology, teamwork and project management. Comprehensive group projects include determining customer requirements, developing design specifications, preparing concept and configuration designs, documentation and presentation.

Pre or CO-Requisite Courses:
• ME 424 and ME 462

Textbooks Used:
• N/A

Course Learning Outcomes:
At the end of the course, students will be able to:

• Knowledge Related
  • identify and define design phases
  • define and describe key elements of design process
  • define, generate, and use project management tools: Gant charts, PERT charts, budgets, milestones, critical path
  • define and provide examples of product cycle time, deliverables, customer-vendor relationships, cross-functional teams and concurrent engineering
  • define and identify team roles and teamwork principles
  • define and recognize intellectual property rights issues
  • define, recognize, and practice professional ethics and behavior
  • describe the significance and relationship of their work to society’s needs and concerns

• Skills Related
  • identify customer requirements
  • translate customer requirements into engineering specifications
  • identify and communicate design constraints
• identify and distinguish design parameters and variables from performance variables and constraints
• participate in the creative process and generate design alternatives
• evaluate design alternatives
• acquire and evaluate appropriate background material relating to a design
• solicit and assess critical reviews of a design and design processes
• communicate the design verbally, graphically and in written form

Topics Covered:
• Design Process – a review
• Defining user needs
• Defining project objectives
• Design specifications
• Feasibility Screening
• Decision making
• Trade-offs
• Parametric Design
• Configuration Design
• Optimization
• Project management
• Successful Meetings
• Teamwork and Self Directed Teams
• Creativity
• Technical Writing
• Learning Styles
• Leadership

Class/Lab Schedule:
• A 1-hour lecture each week
• Two 2 hour laboratories each week

Assessment Methods (Including Computer Usage and Design Content):
• Homework
• Reports of various types
• Oral presentations
• Final project reports

Part III. Design for Accessibility:

In the space below, briefly describe plans for providing access to course materials and activities (or equivalent alternatives) to all students in adherence with the Americans with Disabilities Act. Although these plans may vary from instructor to instructor, the descriptions provided below should be representative of intended departmental and instructor practices. (See example statements appended to this form.)

Course materials will be provided in formats (large font, visual materials, verbal recordings with closed captioning, etc.) on a case by case basis such that all students have the opportunity complete assignments successfully. Access to laboratory equipment and/or data will be provided to accommodate student abilities and needs. Extra time on tests, oral examinations, or other accommodations will be provided to students as needed per the policies of the Disability Resource Center.
Part IV. Evidence of Quality Course Design:

Please use the table below (column headings for this table should not be changed) to provide evidence that the course has been carefully designed and is clearly aligned with Foundational Studies Program desired ULOs. All sections of the course should share similar student learning outcomes. Teaching and Learning Activities and Assessment Methods may vary from instructor to instructor. Please use the table to report representative strategies that may be used. Assessment activities used for reporting to the Foundational Studies Program should be consistent across different sections of the course.

Part V. Additional Justification (Optional):

If the brief justification provided to the University Curriculum Committee in the proposal to accompany the “Request for Curriculum Action” is not sufficient to make the case for including the course in the Foundational Studies Program, additional (optional) narrative can be added here.

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<table>
<thead>
<tr>
<th>Foundational Studies Program Director Signature</th>
<th>Date</th>
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<tbody>
<tr>
<td>Foundation ULO Criteria</td>
<td>Foundation ULO Notions of Exemplary Work</td>
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<td>-------------------------</td>
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</tbody>
</table>
| ULO 8: Natural, Physical, and Applied Science Rubric | Understanding of knowledge & inquiry | • Identify and Define design phases  
• Define and describe key elements of design process  
• Define, generate, and use project management tools  
• Define and provide examples of product cycle time, deliverables, customer-vendor relationships, cross-functional teams and concurrent engineering | • Memos / progress reports / verbal group reports  
• Memos / progress reports  
• Progress reports / proposal  
• Memos / progress reports / verbal group reports | Lectures |
| ULO 4a & 4b: Innovation and Teamwork (All Rubrics) | Contribution, facilitation, conflict, etc. | Define and identify team roles and teamwork principles | Team assessments | Lectures |
| ULO 5: Ethics | • Understanding the ethical domain  
• Analyzing ethical issues | • Define and recognize intellectual property rights issues  
• Define, recognize, and practice professional ethics and behavior | Homework case study with questions | • Lecture on intellectual property rights  
• Lecture on engineering ethical issues |
| ULO 6: Diversity and Internationalization | Identification of issues | Describe the significance and relationship of their work to society’s needs and concerns | Homework relating assigned project to societal issue (energy, sustainability etc.) | Lectures and/or research reading assignments |
| ULO 1: Writing  
ULO 2: Communication | • 1 - Purpose  
• 2 - Listener | Identify customer requirements | Progress reports / proposal | Lectures |
<p>| ULO 4a: Innovation | Divergent/convergent thinking | Translate customer requirements into engineering specifications | Progress reports / proposal | Lectures |</p>
<table>
<thead>
<tr>
<th>Foundation ULO Criteria</th>
<th>Foundation ULO Notions of Exemplary Work</th>
<th>Course Learning Outcomes: By the end of this course, each student should be able to…</th>
<th>Assessment Method: Evidence of Student Learning</th>
<th>Planned Teaching &amp; Learning Activities / Pedagogy</th>
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</thead>
<tbody>
<tr>
<td>ULO 7: Mathematics</td>
<td>7 - Quantitative reasoning</td>
<td>Identify and communicate design constraints</td>
<td>Progress reports / proposal</td>
<td>Lectures</td>
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<tr>
<td>ULO 1: Writing</td>
<td>1 - Purpose &amp; conventions</td>
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<td>ULO 2: Communication</td>
<td>2 - Message, language, &amp; delivery</td>
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<td>ULO 7: Mathematics</td>
<td>7 - Quantitative reasoning</td>
<td>Identify and distinguish design parameters and variables from performance variables and constraints</td>
<td>Progress reports / proposal</td>
<td>Lectures</td>
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<tr>
<td>ULO 8: Natural, Physical, and Applied Science</td>
<td>8 - Process of inquiry and analysis</td>
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<tr>
<td>ULO 4a: Innovation</td>
<td>7 - Appropriate strategy &amp; appropriate tools</td>
<td>Participate in the creative process and generate design alternatives</td>
<td>Progress reports / proposal / personal journal</td>
<td>Lectures</td>
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<td></td>
<td>8 - Process of inquiry and analysis</td>
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<td></td>
<td>4a - Innovative thinking</td>
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<td>ULO 3: Critical Inquiry</td>
<td>3 - Evaluative reasoning</td>
<td>Evaluate design alternatives</td>
<td>Progress reports / proposal / Engineering tool report</td>
<td>Lectures</td>
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<tr>
<td></td>
<td>7 - Appropriate strategy &amp; quantitative reasoning</td>
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<td>ULO 7: Mathematics</td>
<td>7 - Quantitative reasoning</td>
<td>Acquire and evaluate appropriate background material relating to a design</td>
<td>Progress reports / proposal</td>
<td>Lectures</td>
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<tr>
<td>ULO 8: Natural, Physical, and Applied Science</td>
<td>8 - Process of inquiry and analysis</td>
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<td>ULO 1: Writing</td>
<td>1 - Sources, revision</td>
<td>Solicit and assess critical reviews of a design and design process</td>
<td>Customer communication reports /memos</td>
<td>Lectures</td>
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<td>ULO 2: Communication</td>
<td>2 - Language, delivery</td>
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<tr>
<td>ULO 3: Critical Inquiry</td>
<td>3 - Collecting &amp; organizing evidence</td>
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<td>ULO 1: Writing</td>
<td>ULO 2: Communication</td>
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<tr>
<td>• 1 - Conventions, revision, mechanics, strategies, research</td>
<td>• 2 - Message, organization, support, language, delivery</td>
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<tr>
<td>Communicate the design verbally, graphically and in written form</td>
<td>Evidence of Student Learning</td>
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<td>Progress reports, proposal (written), design report (oral)</td>
<td>Lectures</td>
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List of ULO’s 1- 8:

1. Write effectively in multiple contexts, for a variety of audiences.
2. Communicate effectively in speech, both as speaker and listener.
3. Engage in effective critical inquiry by defining problems, gathering and evaluating evidence, and determining the adequacy of argumentative discourse.
4. Think creatively about complex problems in order to produce, evaluate, and implement innovative possible solutions, often as one member of a team.
5. Analyze ethical issues in personal, professional, and civic life and produce reasoned evaluations of competing value systems and ethical claims.
6. Apply knowledge of cultural differences to matters of local, regional, national, and international importance, including political, economic, and environmental issues.
7. Apply knowledge and the methods of reasoning characteristic of mathematics, statistics, and other formal systems to solve complex problems.
8. Apply knowledge and the methods characteristic of scientific inquiry to think critically about and solve theoretical and practical problems about physical structures and processes.