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

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 1. Course Information

<table>
<thead>
<tr>
<th>Course Number and Title:</th>
<th>ME 310 Experimental Methods Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Foundational Studies Course - (choose one):</td>
<td></td>
</tr>
<tr>
<td>[ ] DLS (Disciplinary Lens – Social)</td>
<td>[ ] DLL (Disciplinary Lens – Literature and Humanities)</td>
</tr>
<tr>
<td>[ ] DLM (Disciplinary Lens – Communication in the Mathematics)</td>
<td>[ ] DLN (Disciplinary Lens – Natural, Physical and Applied Sciences)</td>
</tr>
<tr>
<td>[ ] FF (Finishing Foundations)</td>
<td></td>
</tr>
<tr>
<td>Delivery Format(s) - (check all that apply):</td>
<td></td>
</tr>
<tr>
<td>[X] Face to Face</td>
<td>[ ] Fully Online</td>
</tr>
<tr>
<td>[ ] Concurrent Enrollment</td>
<td>[ ] Other (briefly describe):</td>
</tr>
</tbody>
</table>

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.) Attach additional pages if needed.

Boise State's Foundational Studies Program provides undergraduates with a broad-based education that spans the entire university experience. ME 310 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.

**COURSE DESCRIPTION:**
ME 310 EXPERIMENTAL METHODS LAB (1-2-2)(F/S). Instrumentation, data acquisition, and theory verification in the engineering sciences. Emphasis placed on experimental procedure, uncertainty analysis, and technical communication.

**PRE-REQUISITE COURSES:**
- ENGR 240, ENGR 331, and MATH 360 or MATH

**TEXTBOOKS USED:**

**COURSE LEARNING OUTCOMES:**
At the end of the course, students will be able to:
- Read a spec sheet from a sensor manufacturer and apply those data to the analysis of measurements made from that sensor.
- Integrate their knowledge of engineering principles with the operation of various transducers used to measure strain, temperature, flow, pressure, force, voltage and current.
- Recognize sources of uncertainty in measurement systems and account for many of them in analysis
- Properly compute the manner in which uncertainty propagates through computations on measured data.
- Analyze measurement data by applying the fundamental statistical concepts such as Sample, Population, Mean, and Variance to engineering experiments and use these analyses to draw correct conclusions from measured data.
- Design experiments in which multiple factors are varied by applying the basic principles of “Design of Experiments” in an engineering setting
- Present the results of an experimental program in a concise, complete and professional manner in written, oral and poster formats.
- Critically analyze statistical analyses of experimental data performed and presented by others.

**TOPICS COVERED:**
- Basics of instrumentation (Precision, Accuracy, Calibration)
- Domain-Specific Instrumentation (strain, temperature, motion, pressure, etc.)
- Uncertainty and its propagation
- Review of statistical analysis
- Matlab and Labview tutorials and exercises
- Labs involving Thermodynamics, Fluid Mechanics, Heat Transfer, Biomechanics, and Signal processing
- Design of experiments (ANOVA)
• Reporting

CLASS/LAB SCHEDULE:
• One 1-hour lecture and one 2-hour laboratory/week

ASSESSMENT METHODS (INCLUDING COMPUTER USAGE AND DESIGN CONTENT):
• Weekly homework
• Midterm Exams
• Lab reports
• 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.) Attach additional pages if needed.

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

<table>
<thead>
<tr>
<th>Foundational Studies ULO Criteria and Notions of Exemplary Work</th>
<th>Course Learning Outcomes</th>
<th>Assessment Method: Evidence of Student Learning</th>
<th>Planned Teaching and Learning Activities/ Pedagogy</th>
</tr>
</thead>
<tbody>
<tr>
<td>These are drawn from the appropriate rubric for the ULO supported by the course.</td>
<td>“By the end of this course, each student should be able to...”</td>
<td>How will the outcomes be assessed in the course? (Note key assessments to be used for reporting student learning outcomes.)</td>
<td>What kind of activities will be used to support students' success on the planned assessments?</td>
</tr>
<tr>
<td>See Attached Table</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

CERTIFIED FOR APPROVAL 9-19-2011.

[Signature]
Director, Foundational Studies Program
Boise State University
### Course Design Table

<table>
<thead>
<tr>
<th>Foundational Studies ULO Criteria and Notions of Exemplary Work</th>
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<th>Planned Teaching and Learning Activities/Pedagogy</th>
</tr>
</thead>
<tbody>
<tr>
<td>All learning outcomes are listed.</td>
<td>&quot;By the end of this course, each student should be able to...&quot;</td>
<td>How will the outcomes be assessed in the course? (Note key assessments to be used for reporting student learning outcomes.)</td>
<td>What kind of activities will be used to support students' success on the planned assessments?</td>
</tr>
<tr>
<td>Phrases are drawn from the appropriate rubric for the ULO supported by the course.</td>
<td>Effectively use the conventions of written communications expected in Mechanical Engineering as a discipline.</td>
<td>Several written assignments are required. Writing assignments require cogent discourses on a variety of course-related topics. An informal lab procedures paper showing necessary setups and data collection processes is also required before conducting experiments.</td>
<td>Writing exercises Editing exercise</td>
</tr>
<tr>
<td>Write effectively: Purpose, conventions;</td>
<td>Adopt an appropriate voice, tone, and level of formality</td>
<td></td>
<td>Writing exercises Editing exercise</td>
</tr>
<tr>
<td>Write in multiple contexts: Research</td>
<td>Evaluate and synthesize ideas from sources according to standard conventions in Mechanical Engineering. Locate, evaluate, and use a wide variety of relevant resources</td>
<td></td>
<td>Writing exercises Editing exercise</td>
</tr>
<tr>
<td>Write effectively: Revision, Mechanics, Voice;</td>
<td></td>
<td></td>
<td>Writing exercises Editing exercise</td>
</tr>
<tr>
<td>Write for a variety of audiences</td>
<td></td>
<td></td>
<td>Writing exercises Editing exercise</td>
</tr>
<tr>
<td>Write effectively: Sources</td>
<td></td>
<td></td>
<td>Writing exercises Editing exercise</td>
</tr>
<tr>
<td>Communicate effectively as speaker: Message, Support, Organization, Language</td>
<td>Deliver a clear message that is precisely stated and strongly supported by using compelling language choices with tone appropriate to audience and occasion</td>
<td>An oral presentation of a lab report is required, with a question and answer session following. Written critiques are required from each listener.</td>
<td></td>
</tr>
<tr>
<td>---</td>
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</tr>
<tr>
<td>Communicate effectively as speaker: Delivery</td>
<td>Use compelling and appropriate delivery techniques for confident and persuasive presentations</td>
<td>Presentation exercise and observation</td>
<td></td>
</tr>
<tr>
<td>Communicate effectively as listener</td>
<td>Respond appropriately to oral presentations given by other students and demonstrate critical understanding of topic</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ULO:
1. Write effectively in multiple contexts, for a variety of audiences.
2. Communicate effectively in speech, both as speaker and listener.
Course Information  ME 310  CID

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<tr>
<th>Course Number and Title: ME 310 Experimental Methods Lab</th>
<th>Number of Credits: 1</th>
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Type of Foundational Studies Course (choose one)

- DLS (Disciplinary Lens – Social Science)
- DLL (Disciplinary Lens – Literature and Humanities)
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- FF (Finishing Foundations)

Review Committee Checklist

___ X Syllabus Statement - statement introduces the student to the purpose and role of the course in the Foundational Studies Program curriculum.

(9/19) X___ An appropriate number of Course Learning Outcomes are specified for the course and are clearly designed to support the Foundational Studies Program ULOs.

(9/19) X___ Course Learning Outcomes are appropriately designed for level of the course and address both content mastery and skill-based outcomes.

___ X The types and numbers of assessments planned for the course are appropriate for measuring the content or skills being assessed.

(9/19) X___ Course learning activities are likely to promote the achievement of the stated outcomes.

___ X Course design and materials have considered best practices for accessibility to course materials and ideas by all students (e.g., alternatives to auditory and visual content).

Feedback from Review Committee:

With regard to ULO2:
It is unclear how having students "read a spec sheet" relates to having fulfilled ULO 2 ("communicate effectively").
It is unclear how "equipment specification in lab reports" will be used as an assessment method.
It is unclear how "lecture and lab" will enable students to excel in fulfilling ULO2.

With regard to ULO1:
Will the learning outcome "present results of an experimental program" occur through oral presentation?
It is unclear how "lecture and lab" will enable students to excel in fulfilling ULO1.

Very little (inadequate) detail on CID portions were included.
1 credit is not enough to meet the requirement. Earlier you said also ME 480 Senior Design 1 but no form on this was submitted (or made available to review)

9-19-11
Course Design Table revision (attached) submitted. Redesigned course table responds to committee’s concerns and now satisfies the requirements for a CID course. See certification signature on p. 4