ARIZONA STATE UNIVERSITY

GENERAL STUDIES PROGRAM COURSE PROPOSAL COVER FORM

Courses submitted to the GSC between 2/1 and 4/30 if approved, will be effective the following Spring.

Courses submitted between 5/1 and 1/31 if approved, will be effective the following Fall.

(SUBMISSION VIA ADOBE.PDF FILES IS PREFERRED)

DATE 9/7/2010

1. ACADEMIC UNIT: Department of Engineering, College of Technology and Innovation

2. COURSE PROPOSED: EGR 401 Engineering Capstone Project I 4 (prefix ) (number) (title) (semester hours)

3. CONTACT PERSON: Name: Darryl Morrell Phone: 480-727-1123

Mail Code: 0180 E-Mail: morrell@asu.edu

4. ELIGIBILITY: New courses must be approved by the Tempe Campus Curriculum Subcommittee and must have a regular course number. For the rules governing approval of omnibus courses, contact the General Studies Program Office at 965-0739.

5. AREA(S) PROPOSED COURSE WILL SERVE. A single course may be proposed for more than one core or awareness area. A course may satisfy a core area requirement and more than one awareness area requirements concurrently, but may not satisfy requirements in two core areas simultaneously, even if approved for those areas. With departmental consent, an approved General Studies course may be counted toward both the General Studies requirement and the major program of study. (Please submit one designation per proposal)

Core Areas

- Literacy and Critical Inquiry—L
- Mathematical Studies—MA
- Humanities, Fine Arts and Design—HU
- Social and Behavioral Sciences—SB
- Natural Sciences—SQ

Awareness Areas

- Global Awareness—G
- Historical Awareness—H
- Cultural Diversity in the United States—C

6. DOCUMENTATION REQUIRED.

(1) Course Description
(2) Course Syllabus
(3) Criteria Checklist for the area
(4) Table of Contents from the textbook used, if available

7. In the space provided below (or on a separate sheet), please also provide a description of how the course meets the specific criteria in the area for which the course is being proposed.

EGR 401 will fulfill the upper division literacy requirement for students in the BSE in Engineering degree. It is the first course in a two-course sequence that together comprise the senior capstone project for the BSE in Engineering degree. The emphasis in EGR 401 is developing an engineering solution to a customer's requirement or problem, which in turn requires gathering, understanding, and evaluating information about the customer's requirements and possible technical solutions. This work is documented in a substantial end-of-semester report and presentation. These reports and presentations are accompanied by individual summary reports, in which each student individually describes their contribution to gathering and evaluating evidence in their project work. In addition to the project work, a significant component of EGR 401 is student compilation of portfolios that demonstrate achievement of four Engineering Program outcomes. Each portfolio includes an interpretive component that describes the evidence presented in the portfolio and how this evidence demonstrates achievement of an outcome.

Rev. 1/94, 4/95, 7/98, 4/00, 1/02, 10/08
CROSS-LISTED COURSES:  ☒ No  □ Yes; Please identify courses: ____________________________

Is this an online course?:  □ No  ☒ Yes; Is it governed by a common syllabus?  Yes

Chell Roberts  
Chair/Director  (Print or Type)  
Date:  9-5-10

[Signature]  
Chair/Director  (Signature)
Arizona State University Criteria Checklist for

LITERACY AND CRITICAL INQUIRY - [L]

Rationale and Objectives

**Literacy** is here defined broadly as communicative competence in written and oral discourse. **Critical inquiry** involves the gathering, interpretation, and evaluation of evidence. Any field of university study may require unique critical skills which have little to do with language in the usual sense (words), but the analysis of spoken and written evidence pervades university study and everyday life. Thus, the General Studies requirements assume that all undergraduates should develop the ability to reason critically and communicate using the medium of language.

The requirement in Literacy and Critical Inquiry presumes, first, that training in literacy and critical inquiry must be sustained beyond traditional First Year English in order to create a habitual skill in every student; and, second, that the skills become more expert, as well as more secure, as the student learns challenging subject matter. Thus, the Literacy and Critical Inquiry requirement stipulates two courses beyond First Year English.

Most lower-level [L] courses are devoted primarily to the further development of critical skills in reading, writing, listening, speaking, or analysis of discourse. Upper-division [L] courses generally are courses in a particular discipline into which writing and critical thinking have been fully integrated as means of learning the content and, in most cases, demonstrating that it has been learned.

Students must complete six credit hours from courses designated as [L], at least three credit hours of which must be chosen from approved upper-division courses, preferably in their major. Students must have completed ENG 101, 107, or 105 to take an [L] course.

Notes:

1. ENG 101, 107 or ENG 105 must be prerequisites
2. Honors theses, XXX 493 meet [L] requirements
3. The list of criteria that must be satisfied for designation as a Literacy and Critical Inquiry [L] course is presented on the following page. This list will help you determine whether the current version of your course meets all of these requirements. If you decide to apply, please attach a current syllabus, handouts, or other documentation that will provide sufficient information for the General Studies Council to make an informed decision regarding the status of your proposal.
Proposer: Please complete the following section and attach appropriate documentation.

**ASU - [L] CRITERIA**

TO QUALIFY FOR [L] DESIGNATION, THE COURSE DESIGN MUST PLACE A MAJOR EMPHASIS ON COMPLETING CRITICAL DISCOURSE—AS EVIDENCED BY THE FOLLOWING CRITERIA:

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>Identify Documentation Submitted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>EGR 401 Syllabus for Fall 2010</td>
</tr>
</tbody>
</table>

**CRITERION 1:** At least 50 percent of the grade in the course should depend upon writing, including prepared essays, speeches, or in-class essay examinations. *Group projects are acceptable only if each student gathers, interprets, and evaluates evidence, and prepares a summary report.*

1. Please describe the assignments that are considered in the computation of course grades—and indicate the proportion of the final grade that is determined by each assignment.

2. Also:

   **Please circle, underline, or otherwise mark** the information presented in the most recent course syllabus (or other material you have submitted) that verifies this description of the grading process—and label this information "C-1".

**CRITERION 2:** The composition tasks involve the gathering, interpretation, and evaluation of evidence.

1. Please describe the way(s) in which this criterion is addressed in the course design.

2. Also:

   **Please circle, underline, or otherwise mark** the information presented in the most recent course syllabus (or other material you have submitted) that verifies this description of the grading process—and label this information "C-2".

**CRITERION 3:** The syllabus should include a minimum of two substantial writing or speaking tasks, other than or in addition to in-class essay exams.

1. Please provide relatively detailed descriptions of two or more substantial writing or speaking tasks that are included in the course requirements.

2. Also:

   **Please circle, underline, or otherwise mark** the information presented in the most recent course syllabus (or other material you have submitted) that verifies this description of the grading process—and label this information "C-3".
## ASU - [L] CRITERIA

| YES | NO | CRITERION 4: These substantial writing or speaking assignments should be arranged so that the students will get timely feedback from the instructor on each assignment in time to help them do better on subsequent assignments. *Intervention at earlier stages in the writing process is especially welcomed* | EGR 401 Syllabus for Fall 2010 |

1. Please describe the sequence of course assignments--and the nature of the feedback the current (or most recent) course instructor provides to help students do better on subsequent assignments

2. Also:

   Please **circle, underline, or otherwise mark** the information presented in the most recent course syllabus (or other material you have submitted) that verifies this description of the grading process--and label this information "C-4".
Explain in detail which student activities correspond to the specific designation criteria. Please use the following organizer to explain how the criteria are being met.

<table>
<thead>
<tr>
<th>Criteria (from checksheet)</th>
<th>How course meets spirit (contextualize specific examples in next column)</th>
<th>Please provide detailed evidence of how course meets criteria (i.e., where in syllabus)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criterion 1</td>
<td>EGR 401 is the first semester of the Engineering capstone project. Typical activities include problem definition, customer needs analysis, project planning, development of specifications, and concept generation and selection. EGR 401 requires effective research, evaluation, and decision-making. At least half of the course grade depends on a End of Semester Presentation and Report (including an Individual Summary Report) and on written student Portfolios; the portfolios, presentation, and report are assessed on the quality of students gathering, interpreting, and evaluating evidence. An additional percentage of the course grade can depend on assessment by the faculty project mentor of critical thinking activities throughout the semester.</td>
<td>See the &quot;Grades&quot; section of the syllabus.</td>
</tr>
<tr>
<td>Criterion 2</td>
<td>Gathering, interpreting, and evaluating evidence is a key process in many of the project activities, especially customer needs analysis, development of specifications, and concept selection. This process will be assessed by the project mentor throughout the semester. In addition, this work will be documented in the End of Semester Report and presentation.</td>
<td>See the &quot;Portfolio Assignment&quot; and &quot;Individual Summary Report&quot; portions of the &quot;Major Writing Assignments&quot; section of the syllabus.</td>
</tr>
<tr>
<td>Criterion 3</td>
<td>The course requires creation of four portfolios and one end of semester report (with the accompanying individual summary report); the course also requires an end of semester presentation. This is in addition to less formal reports and presentations (e.g. progress reports).</td>
<td>See the &quot;Major Writing Assignments&quot; section of the syllabus.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Criterion 4</td>
<td>Each portfolio is submitted as a draft to receive formative feedback; students then have the opportunity to improve their portfolios before final submission at the end of the semester. The same process is used for the End of Semester Report and Presentation; students submit drafts on which they receive feedback, and then they submit/present a final draft after responding to this feedback.</td>
<td>See the “Tentative Fall 2010 Timeline” section of the syllabus.</td>
</tr>
</tbody>
</table>
Catalog Description

First half of a comprehensive project experience based on cumulative knowledge and skills gained in earlier course work.

Course Objectives

- Students complete the first half of a major project experience that integrates knowledge and skills gained in earlier coursework.
- Students create professional, comprehensive written documentation and deliver appropriate presentations of their project results.
- Students collect, organize, and present evidence that they have achieved required program outcomes.

Course Structure

In EGR 401, students are formed into teams and begin work on a two-semester project; the project will be completed in EGR 402. The primary objective of EGR 401 is typically developing an engineering solution to a problem. In EGR 402, this solution is prototyped and evaluated. Students must take EGR 402 in the semester immediately following EGR 401; project teams will remain the same from EGR 401 to EGR 402. Typical activities in the EGR 401 phase of the project include problem definition, customer needs analysis, project planning, development of specifications, and concept generation and selection. Thus, EGR 401 requires effective research, evaluation, and decision-making. A significant aspect of this work is documenting and justifying the many design decisions that are made.

EGR 401 has the following structure:

- A project course coordinator coordinates course activities and schedules. In particular, the coordinator is responsible to guide students through the development and assessment of portfolios that provide evidence of program outcome achievement.
- Each team has one or more faculty project mentors, who provide technical and managerial guidance, assess team reports and presentations, and, if the project is sponsored by industry, coordinate with the project’s industrial representative to monitor the project work.

Textbooks and Other Materials

No textbook is required for this course. Supplemental materials will be provided by faculty project mentors as necessary to help students learn the specific technical content required for their project.

Expected Type and Amount of Work

Students meet 4 hours per week in class and work about 12 hours per week out of class. The project work is team-based. Students document this work in reports, presentations, and demonstrations. An end-of-semester presentation and report are mandated in this syllabus; other
presentations, reports, briefings, etc. may be required by the project mentor and the industrial representative.

Work products required from each student include:
- Portfolios for the following Engineering Program outcomes: Communication, Critical Thinking, Problem Solving, and Design.
- An individual summary report that documents their individual contributions to gathering, interpreting, and evaluating evidence in the course of their project work. This report will be submitted with the end-of-semester report and presentation.

Work products required from each team include:
- An end-of-semester project report
- An end-of-semester project presentation.
- Progress and intermediate reports and other materials as requested by the industrial sponsor and the project mentor(s).

### Major Assignments

#### Portfolio Assignment

The purpose of the portfolio is for students to collect previous and current work products, interpret their work in the context of an Engineering program outcome, and evaluate how they demonstrate achievement of this outcome. In addition to collecting work products, each portfolio must include a written interpretation of how the work products demonstrate that students have achieved a given program outcome. This written interpretation should briefly describe the context(s) in which the work products were produced, describe the evidence contained in the work products, and evaluate the strength of this evidence in demonstrating achievement of the Engineering program outcome; thus, an adequate interpretation will have a length of multiple pages.

Instructions for completing the outcome portfolios are available at [https://sites.google.com/a/asu.edu/engineering/portfolios-in-project-courses](https://sites.google.com/a/asu.edu/engineering/portfolios-in-project-courses).

#### Final Report Assignment

At a minimum, the end-of-semester report must document the following:
- An overview/summary of the work performed, and necessary documentation of resulting designs, processes, etc.
- A description how of evidence as well as assessment and evaluation of this evidence has guided the project work.
- A bibliography of all sources cited.

The faculty project mentor and industrial representatives may require additional information in the final report and will typically provide more detailed guidance about its structure and content. Because the final report documents the work of three or more students in an intensive project process, its length is required to be greater than 30 pages, and lengths of 100 pages are not uncommon.

#### Final Project Presentation

Each team is required to give a final project presentation to communicate their work done during their 401 project. This presentation will often serve the purpose of a design review for the faculty project mentor and the industrial sponsor. As such, the presentation has a minimum duration of
15 minutes and may last an hour or more in order to ensure that students have developed a viable design going into EGR 402.

**Individual Summary Report**

The individual summary report documents each student’s individual contributions to gathering, interpreting, and evaluating evidence in the course of their 401 project experience. This report must demonstrate that each individual student has exercised critical thinking as part of the project work. (As such, it could be included as evidence in their Critical Thinking portfolio.) This report accompanies the Final Project Report and Final Project Presentation, and may reference them for descriptions of student contributions. This report should have a minimum length of five pages.

**Grades**

Grades are assigned using the following percentages:

<table>
<thead>
<tr>
<th>Outcome Portfolio</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Program Outcome Portfolios</td>
<td>25%</td>
</tr>
<tr>
<td>End-of-Semester Project Report and Presentation (with Individual Summary Report)</td>
<td>25%</td>
</tr>
<tr>
<td>Project Mentor Assessment</td>
<td>50%</td>
</tr>
</tbody>
</table>

In an attachment to this syllabus, the project mentor will specify how their 50% will be apportioned. Typically, it will include assessments of attributes of project success including:

- Individual effort
- Individual contributions to team
- Team effectiveness
- Adherence to schedule
- Quality of deliverables
- Quality of presentations
- Quality of progress and intermediate reports

The assessment of the Outcome Portfolios is coordinated by the course coordinator. The assessment of the End-of-Semester Project Report and Presentation is performed by the project mentor.

**Tentative Fall 2010 Timeline for Major Assignments**

This timeline describes when materials will be due for formative feedback as well summative feedback.

- August 19: First day of class
- September 24: Complete draft of Design portfolio due
- October 8: complete draft of Communication portfolio due, formative feedback on Design returned
- October 22: complete draft of Problem Solving portfolio due, formative feedback on Communication returned
- November 5: complete draft of Individual Summary Report and Critical Thinking portfolio due, formative feedback on Problem Solving returned
- November 19: formative feedback on Individual Summary Report and Critical Thinking
- December 1: complete draft of End-of-Semester Report and Presentation due
- December 8 (Reading day): formative feedback on End-of-Semester Report and Presentation returned
- TBD (by faculty mentor and industrial sponsor): End-of-semester presentation
Expected Level of Student

Seniors majoring in engineering.
Prerequisites: EGR 301 and EGR 302

Student Expectations

1. Students are expected to participate in the educational process and not be a disruptive element with regard to the learning of others. Safety, self discipline and respect for others are necessary elements in the educational processes employed in this course.

2. All students should be familiar with the Student Code of Conduct, which can be found at http://www.asu.edu/studentlife/judicial/. Detailed information on the Student Code of Conduct may be found at http://www.asu.edu/aad/manuals/usi/usi104-01.html.

3. Students are expected to execute all course assignments and activities in accordance with the University’s Student Academic Integrity Policy in the 2007-2008 general catalog located at http://www.asu.edu/aad/catalogs/general/ug-enrollment.html#27839 under the heading Retention and Academic Standards.

4. The Americans with Disabilities Act (ADA) is a Federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. If you believe you have a disability requiring an accommodation please contact the Disability Resource Center at ASU Polytechnic located in Student Affairs Quad # 4 or call 480-727-1039 / TTY: 480-727-1009. Eligibility and documentation policies are online at http://www.asu.edu/studentaffairs/ed/drc/