

**Application for a New Course v10.5**

|                                            |          |
|--------------------------------------------|----------|
| <b>Course ID</b> <i>Subject and Number</i> | ENGR 350 |
| <b>Date APPROVED</b>                       |          |
| <b>Date DENIED</b>                         |          |

**I. Systems and Catalog Information** Complete each item.

|     |                                                      |                                                                                                                                                                                       |
|-----|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Course Developer                                     | Lori Houghtalen                                                                                                                                                                       |
| 2   | Course Teacher                                       | A member of the Engineering & Physics Department faculty                                                                                                                              |
| 3   | Course Title                                         | Engineering Economics                                                                                                                                                                 |
| 4   | Course Abbreviation (if title is over 30 characters) | Engineering Economics                                                                                                                                                                 |
| 5   | College                                              | College of Arts and Sciences                                                                                                                                                          |
| 6   | Department                                           | Engineering and Physics                                                                                                                                                               |
| 7   | Number of Credit Hours                               | 3                                                                                                                                                                                     |
| 8   | Is the course Fixed Credit or Variable Credit?       | Fixed                                                                                                                                                                                 |
| 9   | Is the course repeatable?                            | No                                                                                                                                                                                    |
| 10  | Maximum number of times course may be repeated       | N/A                                                                                                                                                                                   |
| 11  | Maximum number of hours credit                       | N/A                                                                                                                                                                                   |
| 12  | Explanation for variable credit                      | N/A                                                                                                                                                                                   |
| 13a | Course contact hours - LEC                           | 3                                                                                                                                                                                     |
| 13b | Course contact hours - Lab                           | 0                                                                                                                                                                                     |
| 13c | Course contact hours - Practicum                     | 0                                                                                                                                                                                     |
| 13d | Course contact hours - Seminar                       | 0                                                                                                                                                                                     |
| 13e | Course contact hours - Studio                        | 0                                                                                                                                                                                     |
| 13f | Course contact hours - Online                        | 0                                                                                                                                                                                     |
| 13g | Course contact hours - Colloquium                    | 0                                                                                                                                                                                     |
| 13h | Course contact hours – Field Experience              | 0                                                                                                                                                                                     |
| 13j | Course contact hours - Internship                    | 0                                                                                                                                                                                     |
| 13k | Course contact hours - Research                      | 0                                                                                                                                                                                     |
| 13m | Course contact hours - Workshop                      | 0                                                                                                                                                                                     |
| 13n | Course contact hours – Other (specify)               | 0                                                                                                                                                                                     |
| 14  | Instructor Workload                                  | 3                                                                                                                                                                                     |
| 15  | Grade Mode (check all appropriate):                  | <input checked="" type="checkbox"/> Standard<br><input type="checkbox"/> Credit/No Credit (undergrad only)                                                                            |
| 16  | Maximum Enrollment                                   | 40                                                                                                                                                                                    |
| 17  | <b>Catalog Description</b><br>(50 words or less)     | Application of economic analysis techniques to analyze and compare engineering projects or other type of investments. Topics covered include principles of economic equivalence, time |

|     |                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                    |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                                 | value of money, analysis of investments, comparison of alternatives, equipment depreciation and income taxes, inflation, and uncertainty.                                                                                                                                                                                          |
| 18  | List any prerequisites (course/s, test scores, class standing, major, etc.)                                                                                                                                                                                                                                                                                     | Prerequisites: Credit for MATH 185 or placement into MATH 186 or 286, or credit for MATH 131 or placement into MATH 132.                                                                                                                                                                                                           |
| 19  | List any co-requisites                                                                                                                                                                                                                                                                                                                                          | None                                                                                                                                                                                                                                                                                                                               |
| 20  | If the course is cross listed, specify the Course ID(s) MUST have signature in Section V off all Department Chairs                                                                                                                                                                                                                                              | None                                                                                                                                                                                                                                                                                                                               |
| 21  | Does this course have any special student costs? Yes/No<br><i>Attach a completed "Request to Add or Change Course Fees" form. Describe in section IV-F.</i>                                                                                                                                                                                                     | None                                                                                                                                                                                                                                                                                                                               |
| 22a | How often will it be offered? <b>Fall</b>                                                                                                                                                                                                                                                                                                                       | As needed                                                                                                                                                                                                                                                                                                                          |
| 22b | How often will it be offered? <b>Spring</b>                                                                                                                                                                                                                                                                                                                     | Offered                                                                                                                                                                                                                                                                                                                            |
| 22c | How often will it be offered? <b>Summer</b>                                                                                                                                                                                                                                                                                                                     | As needed                                                                                                                                                                                                                                                                                                                          |
| 23  | Frequency? All, odd, or even years?                                                                                                                                                                                                                                                                                                                             | All                                                                                                                                                                                                                                                                                                                                |
| 24  | First semester this course will be offered<br><i>New courses may not be taught under their approved course ID until they appear in the catalog, therefore, no earlier than the coming fall.</i>                                                                                                                                                                 | Spring 2016                                                                                                                                                                                                                                                                                                                        |
| 25  | List course/s that should be deleted, include the last semester for course/s being deleted<br><i>A course cannot be deleted when it is a requirement in a degree plan in any department.</i>                                                                                                                                                                    | None                                                                                                                                                                                                                                                                                                                               |
| 26  | Is this course required for a degree/s? Yes/No<br><i>If "Yes," attach a revised degree plan(s) reflecting the placement of the new course.</i>                                                                                                                                                                                                                  | This is a required course for Engineering majors and intended to be completed during the sophomore or junior year. <i>This course is appropriate for any student interested in developing their quantitative analysis skills, particularly students interested in business applications. See attached for revised degree plan.</i> |
| 27  | Should the addition of this course be retroactively applied to the degree plan it supports? Yes/no and explain                                                                                                                                                                                                                                                  | No.                                                                                                                                                                                                                                                                                                                                |
| 28  | Has this course been offered as a Special Topics course? Yes/No<br><i>If "Yes," specify the Course ID and enrollment for each term it was taught.</i><br><i>(Note: New courses are NOT required to be taught as Special Topics courses prior to being approved. However, courses may be taught once as Special Topics before it is proposed. See the Course</i> | No                                                                                                                                                                                                                                                                                                                                 |

|    |                                                                                                                                                                                                               |      |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
|    | <i>Descriptions section of the Catalog for details.)</i>                                                                                                                                                      |      |
| 29 | List any courses in which content overlaps the proposed course.<br>(Course ID and Name)<br><i>Attach statement from instructor/dept chair of existing course justifying the new offering in Section IV-D.</i> | None |

## II. Curriculum

|   |                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                 |
|---|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <b>Degree Plan</b> Explanation of how this course affects degree requirements.                                     | The course is being added to the list of required courses in the degree plan for the BSE degree; however, due to the restructuring of other courses the total number of hours required in the degree remains 128.                                                                                                                               |
| 2 | <b>Justification</b> State the justification for adding this course to the current curriculum. Represent the need. | The course will equip students to make educated decisions about project alternatives once in the engineering workforce. Additionally, the content of this course will prepare students to succeed on the Engineering Economy section of the FE exam; passing the FE exam is the first step toward gaining licensure as a Professional Engineer. |

## III. Course Design

### 1. Audience and Course Goal

|   |                                                                |                                                                                                                                                                                                                                                                                                                                                                       |
|---|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Describe the intended audience, including prerequisite skills. | This is a required course for Engineering majors and intended to be completed during their Sophomore or Junior year. This course is appropriate for any student interested in developing his or her quantitative analysis skills, particularly students interested in business applications. The prerequisite skills are math at the level of Calculus I or MATH 131. |
| 2 | State the overarching course goal(s) in performance terms.     | 1) Students will understand how to compare project alternatives from an economic standpoint, and be able to compute various metrics that are often used when evaluating engineering projects.<br>2) Students will understand how to describe risk and account for uncertainty in the decision-                                                                        |

|  |  |                                                                                                            |
|--|--|------------------------------------------------------------------------------------------------------------|
|  |  | making process.<br>3) Students will be able to create, analyze, and interpret spreadsheet models in Excel. |
|--|--|------------------------------------------------------------------------------------------------------------|

## 2. Competencies and Measurements

| ABET Learning Objectives                                                                                                                         | Competencies                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Measurement                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| 3 (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context | Be able to conduct analysis in order to justify or reject projects/alternatives on an economic basis. Specifically, students will be able to: <ul style="list-style-type: none"> <li>• compute and evaluate present worth, future worth, and annual worth</li> <li>• compute and evaluate rates of return</li> <li>• compute and evaluate benefit-cost analysis</li> <li>• conduct sensitivity, break-even, and scenario analysis to understand project risk</li> </ul> | Homework, quizzes, and exams |
| 3(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice                                   | Students will be able to create, analyze, and interpret effective spreadsheet models in Excel.                                                                                                                                                                                                                                                                                                                                                                          | Homework, quizzes, and exams |

## 3. Text and Resources

1. Give the full publication information of the textbook/s and other required resources and outside readings.

*Fundamentals of Engineering Economics*, 3<sup>rd</sup> edition, by Chan Park, Pearson Education, Inc, 2013, ISBN 978-0-13-277542-7.

2. For **combined undergraduate/graduate** courses, make two lists:
  - a. full publication information; label **Undergraduate**.
  - b. full publication information; label **Graduate**. Indicate number of pages required.

## IV. Supporting Documentation

*Supporting documents must accompany proposal prior to preliminary approval by chair and dean.*

|   |                                                                                                                                                                                                                                                                                                                                         |
|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <b>Library</b> — Submit new course application and syllabus to the Dean of the Library. Consult with the director and establish a deadline for completion of the library report. <b>Attach</b> the signed copy of the Library report.                                                                                                   |
| 2 | <b>Instructional Design</b> — The application and syllabus must be reviewed by the Adams Center. <b>Attach</b> a copy of the Adams Center Review Letter.                                                                                                                                                                                |
| 3 | <b>Content Overlap</b> — Include one document for each course you listed in Section I-I. <b>Attach</b> statement from instructor/dept chair of existing course justifying the new offering.                                                                                                                                             |
| 4 | <b>Departmental Resources</b> — List the resources that support the course and are available only through the department, if applicable. <b>Attach</b> the list of the holdings and the location/s.                                                                                                                                     |
| 5 | <b>Resources</b> — List resources (other than library or departmental resources) that are needed to support this course (computers, lab equipment, other technology, etc.). <b>Attach</b> a complete list of all items and indicate possible sources or estimated cost of each. List the sources of any needed funds.                   |
| 6 | <b>Expenses</b> — List additional expenses needed to implement this course (full-time or part-time faculty, graduate or lab assistants, student employees, travel, special student costs, room renovation, storage facility, etc.). <b>Attach</b> a complete list of all items, the estimated cost of each and the source of the funds. |
| 7 | <b>Justification</b> — <b>Attach</b> all documents referred to in Section II-2                                                                                                                                                                                                                                                          |
| 8 | Syllabus — <b>Attach</b> the syllabus for the course based upon the anticipated first-semester offering.                                                                                                                                                                                                                                |
| 9 | Provide documentation for all additional attachments here                                                                                                                                                                                                                                                                               |

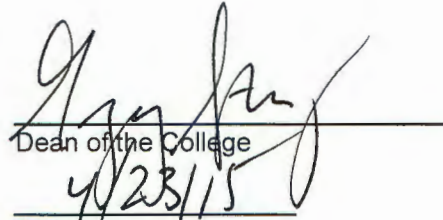
## V. Preliminary Approvals

All supporting documentation has been assembled and attached to this application. I believe this course is ready to be presented to appropriate councils. We have a plan to fund this new course.

Course Number and Name ENGR 350 Engineering Economics

### Primary Department

  
\_\_\_\_\_  
Department Chair  
4/21/2015  
\_\_\_\_\_  
Date

  
\_\_\_\_\_  
Dean of the College  
4/23/15  
\_\_\_\_\_  
Date

**Cross-listing Department** *Add more lines if multiple departments are cross-listing*

\_\_\_\_\_  
Department Chair  
  
\_\_\_\_\_  
Date

\_\_\_\_\_  
Dean of the College  
  
\_\_\_\_\_  
Date

**Cross-listing Department** *Add more lines if multiple departments are cross-listing*

\_\_\_\_\_  
Department Chair  
  
\_\_\_\_\_  
Date

\_\_\_\_\_  
Dean of the College  
  
\_\_\_\_\_  
Date

## VI. Actions *Place all actions on one page.*

Course ID: ENGR 350

Course Title: Engineering Economics

### 1. College Academic Council: (for all courses)

Note: Insert additional lines for College Academic Council action for each college involved in cross-listed courses.

Approved ☒ Denied ☐

*Lyndee Strong Penze*  
College Dean or Director

4-23-15  
Date

Approved ☐ Denied ☐

\_\_\_\_\_  
College Dean or Director

\_\_\_\_\_  
Date

### 2. Graduate Council: (for graduate level courses)

Approved ☐ Denied ☐

\_\_\_\_\_  
Dean of Graduate School

\_\_\_\_\_  
Date

### 3. Teacher Education Council: (when applicable)

Approved ☐ Denied ☐

\_\_\_\_\_  
TEC Chair

\_\_\_\_\_  
Date

### 4. University General Education Council: (when applicable)

Approved ☐ Denied ☐

\_\_\_\_\_  
Provost's designee

\_\_\_\_\_  
Date

### 5. University Undergraduate Academic Council: (*undergraduate level courses*)

Approved ☐ Denied ☐

\_\_\_\_\_  
Vice Provost

\_\_\_\_\_  
Date

### 6. Academic Provost: (for all courses)

Approved ☐ Denied ☐

\_\_\_\_\_  
Provost

\_\_\_\_\_  
Date

### 7. President of the University: (for all courses)

Approved ☐ Denied ☐

\_\_\_\_\_  
President

\_\_\_\_\_  
Date

Attach notes, comments, or conditions from appropriate councils: