PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION, OR REVISION OF AN UNDERGRADUATE COURSE
(10000-40000 LEVEL)

DEPARTMENT: School of Engineering Education
EFFECTIVE SESSION: Fall 2016

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

1. New course with supporting documents
2. Add existing course offered at another campus
3. Expiration of a course
4. Change in course number
5. Change in course title
6. Change in course credit/type
7. Change in course attributes (department head signature only)
8. Change in instructional hours
9. Change in course description
10. Change in course requisites
11. Change in semesters offered (department head signature only)
12. Transfer from one department to another

PROPOSED:

Subject Abbreviation: IDE
Long Title: Multidisciplinary Engineering Analysis & Decision Making
Short Title: MDE ENGR Analysis/Decision

Course Number: 48300

COURSE ATTRIBUTES: Check All That Apply

- 6. Registration Approval Type
- 7. Variable Title
- 8. Honors
- 9. Full Time Privilege
- 10. Off Campus Experience

TERM OFFERED:

- Summer
- Fall
- Spring

CAMPUS(ES) INVOLVED:

- Calumet
- Cont Ed
- Ft. Wayne
- N. Central
- Tech Statewide
- Indianapolis
- West Lafayette

CRedit TypE:

1. Fixed Credit: Cr. Hrs.
2. Variable Credit Range: Minimum Cr. Hrs. To Maximum Cr. Hrs.
3. Equivalent Credit: Yes No

SCHEDULE/TyPE:

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Minutes Per Mtg</th>
<th>Meetings Per Week</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
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</table>

<table>
<thead>
<tr>
<th>Recitation</th>
<th>Lab Prep</th>
<th>Studio</th>
<th>Distance</th>
<th>Clinic</th>
<th>Experimental</th>
<th>Research</th>
<th>Ind. Study</th>
<th>Prac/Obser</th>
</tr>
</thead>
</table>

| % of Credit Allocated | 100 |

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):

Application of product evaluation, cost estimating, and product/project feasibility and viability analysis from multidisciplinary perspectives in the context of new product development. Topics include exposure to company success measures, quantitative and qualitative analysis, sensitivity analysis, cost-benefit analysis, project comparisons; new product life-cycle analysis and related engineering decisions. Topics are explored through case-based, industrially focused examples. The course centers on the creation and use of analytical spreadsheets with computer tools/software for routine engineering analysis and decision making.

*COURSE LEARNING OUTCOMES:

This course is one method by which Multidisciplinary Engineering students can satisfy the engineering economics portion of the MDE core. The following ABET/Multidisciplinary Engineering outcomes are assessed in IDE 48300: Application math, science and engineering, Analyze and interpret data, Ability to design, subject to economic constraints, Identify, formulate, and solve engineering problems, Impact engineering in global, economic, environmental & societal context. Use the techniques, skills, and modern engineering tools necessary for engineering practice.

Calumet Department Head: Date
Calumet School Dean: Date

Fort Wayne Department Head: Date
Fort Wayne School Dean: Date

Indianapolis Department Head: Date
Indianapolis School Dean: Date

North Central Department Head: Date
North Central Chancellor: Date

West Lafayette Department Head: Date
West Lafayette College/School Dean: Date
West Lafayette Registrar: Date

OFFICE OF THE REGISTRAR
TO: The Engineering Faculty
FROM: The Faculty of the School of Engineering Education
RE: New Undergraduate Course IDE 48300 Multidisciplinary Engineering Analysis & Decision Making

The Faculty of the School of Engineering Education has approved the new course listed below. This action is now submitted to the Engineering Faculty with a recommendation for approval.

IDE 48300 Multidisciplinary Engineering Analysis & Decision Making
Sem. 1, Lecture 1, Credit 1
Pre-or co-requisite: MA 16200/16600. Authorized equivalent courses or consent of instructor may be used in satisfying course pre- and co-requisites.
Course Attribute: Approval by Department

Course Description:
Application of product evaluation, cost estimating, and product/project feasibility and viability analysis from multidisciplinary perspectives in the context of new product development. Topics include exposure to company success measures, quantitative and qualitative analysis; sensitivity analysis; cost-benefit analysis, project comparisons; new product life-cycle analysis and related engineering decisions. Topics are explored through case-based, industrially focused examples. The course centers on the creation and use of analytical spreadsheets with computer tools/software for routine engineering analysis and decision making.

Reason:
The Multidisciplinary Engineering program seeks to provide students as much academic flexibility as possible while meeting ABET requirements. This engineering analysis and decision making course will be taught in the context of new product development. This aligns with the MDE capstone design course (IDE 49500) in the following semester. The proposed course emphasizes the application of concepts through the extensive use of computer spreadsheets, that will assist MDE students in satisfying ABET criterion 3k. Providing IDE 48300 will help achieve this goal. MDE students who wish to enlarge their knowledge of classic engineering economics topics will be advised to take IE34300, especially those undertaking the Engineering Management plan of study.

David Radcliffe, Kamyar Haghigi Head
School of Engineering Education

Approved for the faculty of the Schools of Engineering by the Engineering Curriculum Committee
ECC Minutes 11 Dates 1-26-16
Chairman ECC
IDE 48300 Multidisciplinary Engineering Analysis & Decision Making

Sem. 1, Lecture 1, Credit 1
Pre-or co-requisite: ENGR 12600, MA 16200/16600. Authorized equivalent courses or consent of instructor may be used in satisfying course pre- and co-requisites.
Course Attribute: Approval by Department

Course Description:
Application of product evaluation, cost estimating, and product/project feasibility and viability analysis from multidisciplinary perspectives in the context of new product development. Topics include exposure to company success measures, quantitative and qualitative analysis; sensitivity analysis; cost-benefit analysis, project comparisons; new product life-cycle analysis and related engineering decisions. Topics are explored through case-based, industrially focused examples. The course centers on the creation and use of analytical spreadsheets with computer tools/software for routine engineering analysis and decision making.

Course Outcomes:
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<table>
<thead>
<tr>
<th>ABET</th>
<th>MDE</th>
<th>Program Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>3a</td>
<td>1</td>
<td>Application math, science and engineering</td>
</tr>
<tr>
<td>3b</td>
<td>2b</td>
<td>Analyze and interpret data</td>
</tr>
<tr>
<td>3c</td>
<td>3</td>
<td>Ability to design, subject to economic constraints</td>
</tr>
<tr>
<td>3e</td>
<td>5</td>
<td>Identify, formulate, and solve engineering problems</td>
</tr>
<tr>
<td>3h</td>
<td>8</td>
<td>Impact engineering in global, economic, environmental &amp; societal context</td>
</tr>
<tr>
<td>3k</td>
<td>11</td>
<td>Use the techniques, skills, and modern engineering tools necessary for engineering practice</td>
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</table>

Proposed Course Schedule:

<table>
<thead>
<tr>
<th>High-Level Topic Area</th>
<th>Discussion topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company &amp; Engineering Performance Metrics</td>
<td>Engineering, Accounting, &amp; application of Project Cost Estimation (Class 1-3)</td>
</tr>
<tr>
<td>Base Case Product/Project Financial Modeling</td>
<td>Investment considerations; confluence of project cost, investment incentives (payouts), New product launch schedules, and the impact of process life-cycles (Class 4-6)</td>
</tr>
<tr>
<td>Project Assessment &amp; Competing Alternatives</td>
<td>Project/Product Break even analysis and Cost/Benefit analysis. (Class 7-9)</td>
</tr>
<tr>
<td>Project Uncertainty</td>
<td>New product uncertainty &amp; Risk considerations; sensitivity analysis (Class 10-12)</td>
</tr>
<tr>
<td>Large scale Project Considerations</td>
<td>Asset acquisition, Make/Buy analysis, (Class 13-15)</td>
</tr>
</tbody>
</table>

Total 16 class sessions

Required and Supplementary Text:
There is no required textbook. Multiple sources of supplemental and online materials will be provided.

Grading: Application in practice/Homework 40%; Quizzes 20%; Exam 10%; Attendance & In-Class Activities (including Discussion & Demonstration) 30%.