New Course Request

Check Appropriate Boxes:

Undergraduate credit [ ]
Graduate credit [ ]
Professional credit [ ]

1. School/Division: School of Engineering and Technology
2. Academic Subject Code: ECE

3. Course Number: 26200 (must be cleared with University Enrollment Services)
4. Instructor: Brian King

5. Course Title: Engineering Programming Lab

Recommended Abbreviation (Optional): Engr Prog Lab

(Limited to 32 Characters including spaces)

6. First time this course is to be offered (Semester/Year): Fall 2010

7. Credit Hours: Fixed at 1 or Variable from ________ to ________

8. Is this course to be graded S-F (only)? Yes [ ] No [ ]

9. Is variable title approval being requested? Yes [ ] No [ ]

10. Course description (not to exceed 50 words) for Bulletin publication:

Introduction to problem solving using software tools, in particular the C programming language.

Prerequisites: ENGR 19500 and ENGR 19600. Corequisite: ECE 26300

11. Lecture Contact Hours: Fixed at ________ or Variable from ________ to ________

12. Non-Lecture Contact Hours: Fixed at 3 or Variable from ________ to ________

13. Estimated enrollment: 30 of which ______ percent are expected to be graduate students.

14. Frequency of scheduling: Spring/Fall Will this course be required for majors? Yes [ ]

15. Justification for new course: This is the one-hour lab component, to supplement the 3 credit course ECE 26300

16. Are the necessary reading materials currently available in the appropriate library? Yes [ ]

17. Please append a complete outline of the proposed course, and indicate instructor (if known), textbooks, and other materials.

18. If this course overlaps with existing courses, please explain with which courses it overlaps and whether this overlap is necessary, desirable, or unimportant.

19. A copy of every new course proposal must be submitted to departments, schools, or divisions in which there may be overlap of the new course with existing courses or areas of strong concern, with instructions that they send comments directly to the originating Curriculum Committee. Please append a list of departments, schools, or divisions thus consulted.

Submitted by:

[Signature]
Department Chairman/Division Director

Date: 10/19/09

[Signature]
Dean of Graduate School (when required)

Date

Approved by:

[Signature]
Dean

Date: 11/16/09

[Signature]
Chancellor/Vice-President

Date

[Signature]
University Enrollment Services

Date

After School/Division approval, forward the last copy (without attachments) to University Enrollment Services for initial processing, and the remaining four copies and attachments to the Campus Chancellor or Vice-President.

University Enrollment Services

Final—White; Chancellor/Vice-President—Blue; School/Division—Yellow;
Department/Division—Pink; University Enrollment Services Advance—White
PURDUE SCHOOL OF ENGINEERING & TECHNOLOGY
COURSE OUTCOMES AND ASSESSMENT DATA SHEET

This is an internal document to identify and record expected outcomes and anticipated assessment strategies for all courses taught within the School of Engineering and Technology. Submission of this form, as noted below, is required and must accompany all new course and course change requests. Copies of this form should also be retained within the department and kept on file with the outline or syllabus for each course.

Course Number: ECEN 367 Course Title: Programming for Engineers

Procedure:

1. First, identify all instructional outcomes expected for this course, and then select all ABET outcomes which are consistent with these anticipated objectives from TABLE 1 below.

<table>
<thead>
<tr>
<th>TABLE 1 - ABET OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENGINEERING - EAC Criteria #3</strong></td>
</tr>
<tr>
<td>An ability to apply knowledge of mathematics, science and engineering</td>
</tr>
<tr>
<td>An ability to design and construct experiments as well as to analyze and interpret data</td>
</tr>
<tr>
<td>An ability to design a system, component, or process to meet desired needs</td>
</tr>
<tr>
<td>An ability to function on multi-disciplinary teams</td>
</tr>
<tr>
<td>An ability to identify, formulate and solve engineering problems</td>
</tr>
<tr>
<td>An understanding of professional and ethical responsibility</td>
</tr>
<tr>
<td>An ability to communicate effectively</td>
</tr>
<tr>
<td>The broad education necessary to understand the impact of engineering solutions in global societal context</td>
</tr>
<tr>
<td>A recognition of the need for and an ability to engage in life-long learning</td>
</tr>
<tr>
<td>A knowledge of contemporary issues</td>
</tr>
<tr>
<td>An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice</td>
</tr>
</tbody>
</table>

2. Subsets for each of the six IUPUI Principles of Undergraduate Learning (PUL) are given on the reverse side in TABLE 2. Using a number corresponding to each ABET outcome identified from TABLE 1 above to select a column, place a “✓” or “✗” mark in the applicable TABLE 2 row(s) cell for each PUL. Courses will often address multiple ABET outcomes and ABET outcomes frequently will overlap more than one PUL subset. Thus, it is expected completed data sheets may contain marks in several cells thereby indicating the course simultaneously satisfies multiple Principles of Undergraduate Learning while fulfilling its intended ABET objective(s).

3. After completing TABLE 2, briefly define or explain how the course outcomes or objectives will be evaluated within the context of the departmental assessment program in the space below:

EVERY SEMESTER STUDENTS SELF ASSESS THEIR ABILITY FOR EACH OUTCOME IN A SURVEY. INSTRUCTOR COMPLETES A SURVEY AS WELL. IF STUDENT AVERAGES DON'T EXCEED A THRESHOLD, INSTRUCTOR MUST COMPLETE REPORT TO ADDRESS DIFFERENCES.

Submitted by: Brian King Date: 3/4/08

Assessment/Outcome: 11-25-99
#### TABLE 2 - MATRIX OF EXPECTED COURSE OUTCOMES

(Suggestion - while completing Table 2, place a copy of the ABET outcomes from Table 1 along side for easy cross referencing.)

<table>
<thead>
<tr>
<th>PRINCIPLES OF UNDERGRADUATE LEARNING - “Require All Students to Demonstrate An Ability to:”</th>
<th>ENGINEERING OUTCOMES - EAC CRITERIA #3: items (a) to (k)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1(a) - Express ideas and facts effectively in written formats</td>
<td>a</td>
</tr>
<tr>
<td>1(b) - Comprehend, interpret, and analyze texts</td>
<td></td>
</tr>
<tr>
<td>1(c) - Communicate orally in one-on-one and group settings</td>
<td></td>
</tr>
<tr>
<td>1(d) - Solve problems that are quantitative in nature</td>
<td></td>
</tr>
<tr>
<td>1(e) - Make efficient use of information resources and technology for personal and professional needs</td>
<td></td>
</tr>
<tr>
<td>2(a) - Analyze complex issues and make informed decisions</td>
<td></td>
</tr>
<tr>
<td>2(b) - Synthesize information in order to arrive at reasoned conclusions</td>
<td></td>
</tr>
<tr>
<td>2(c) - Evaluate the logic, validity, and relevance of data</td>
<td></td>
</tr>
<tr>
<td>2(d) - Solve challenging problems</td>
<td></td>
</tr>
<tr>
<td>2(e) - Use knowledge and understanding to generate and explore new questions</td>
<td></td>
</tr>
<tr>
<td>3(a) - Apply knowledge to enhance personal lives</td>
<td></td>
</tr>
<tr>
<td>3(b) - Apply knowledge to meet professional standards and competencies</td>
<td></td>
</tr>
<tr>
<td>3(c) - Apply knowledge to further the goals of society</td>
<td></td>
</tr>
<tr>
<td>4(a) - Demonstrate substantial knowledge and understanding of at least one field of study</td>
<td></td>
</tr>
<tr>
<td>4(b) - Compare and contrast approaches to knowledge in different disciplines</td>
<td></td>
</tr>
<tr>
<td>4(c) - Modify their approach to an issue or problem based on the contexts and requirements of particular situations</td>
<td></td>
</tr>
<tr>
<td>5(a) - Compare and contrast the range of diversity and universality in human history, societies, and ways of life</td>
<td></td>
</tr>
<tr>
<td>5(b) - Analyze and understand the interconnectedness of global and local concerns</td>
<td></td>
</tr>
<tr>
<td>5(c) - Operate with civility in a complex social world</td>
<td></td>
</tr>
<tr>
<td>6(a) - Make informed and principles choices regarding conflicting situations in their personal and public lives and to foresee the consequences of these choices</td>
<td></td>
</tr>
<tr>
<td>8(b) - Recognize the importance of aesthetics in their personal lives and to society</td>
<td></td>
</tr>
</tbody>
</table>
ECE 26200  Engineering Programming Lab (1cr)

Co-requisite:  ECE 26300.


Course Description: Introduction to problem solving using software tools, in particular the C programming language

Week-to-week schedule (tentative schedule, labs and software assignments will incorporate the following topics)

Week 1:  Introduction to Problem Solving using Software Tools
         Review

Week 2:  Applied Engineering problem. Introduction to C

Week 3:  Operators, expressions and statements
         Formatted input/output

Week 4:  C control statements and looping,
         C Functions

Week 5:  Conditional statements
         Random Number Generation

Week 6:  Text File I/O,
         C functions (cont’d)

Week 7:  Arrays and Pointers

Week 8:  Pointers

Week 9:  Pointer to pointer and String functions

Week 10: Memory management

Week 11: Structures and derived data types
         Bit operations

Week 12: File I/O

Week 13: Preprocessor and Advanced C Tools

Week 14: Semester Project

Week 15: Semester Project (cont’d)
Required Course  ECE 26200  Programming for Engineers Lab
(1cr)

Co-requisite:  ECE 26300

Prerequisites by topic:  Basic knowledge of Matlab and IBM-PC Windows environment.


Coordinator:  Brian King Associate Professor of Electrical and Computer Engineering.

Goals:  To teach students C programming language, the principles of good programming and the top-down design approach in building software tools.

Outcomes:  Upon successful completion of the course, students should be able to:

1. Develop algorithms to solve Engineering problems by using a step-by-step process. [e]
2. Use the Matlab to solve Engineering problems [c,k]
3. Use a standard C program development environment. [k]
4. Use loops, selection structures, arrays, functions and input/output commands in structured C programs. [e]
5. Read and write C programs that use pointers [a,c,e,k]
6. Read and write C programs that use structures [a,c,e,k]
7. Read and write C programs that use files [a,c,e,k]
8. Read and write C programs that use dynamic data structures [a,c,e,k]

Topics:

1. Overview of problem solving using software tools
2. C programming language
3. Control Statements
4. Conditional Statements
5. Data types (simple and structured)
6. Arrays
7. Functions
8. The use of pointers
9. Dynamic memory management
10. Linked lists and trees
11. Recursion
12. Binary I/O
13. Random number generation
14. Standard C Library

Computer usage: Students are required to use Matlab and a C compiler to do their homework and program projects.

Laboratory projects: Students complete projects that involve developing programs that requires the use of the standard C language syntax. Problems will include the use of loops, arrays, functions, pointers, structures, file read and writing and dynamic data structures.

Evaluation method: Lab assignments, programming assignments, and semester project

ABET category: Engineering science: 0.5 credit or 50%
               Engineering design: 0.5 credit or 50%

Prepared by: Brian King  Date: _
PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF AN UNDERGRADUATE COURSE
(100-400 LEVEL)

DEPARTMENT: Electrical and Comp. Engineering
EFFECTIVE SESSION: Fall 2010

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

- New course with supporting documents
- Add existing course offered at another campus
- Expiration of a course
- Change in course number
- Change in course title
- Change in course credit/type
- Change in course attributes (department head signature only)
- Change in instructional hours
- Change in course description
- Change in course requisites
- Change in semesters offered (department head signature only)
- Transfer from one department to another

PROPOSED:
Subject Abbreviation: ECE
Course Number: 26200
Long Title: Engineering Programming Lab
Short Title: Engr Prog Lab

EXISTING:
Subject Abbreviation
Course Number

TERMS OFFERED:
Check All That Apply:
- Summer
- Fall
- Spring

CAMPUS(ES) INVOLVED:
- Calumet
- Cont Ed
- Ft. Wayne
- Indianapolis
- N. Central
- Tech Statewide
- W. Lafayette

CREDIT TYPE:
1. Fixed Credit: Cr. Hrs.
2. Variable Credit: Range:
   Minimum Cr. Hrs.
   Maximum Cr. Hrs.
3. Equivalent Credit: Yes
4. Thesis Credit: Yes

COURSE ATTRIBUTES:
- 1. Pass/Not Pass Only
- 2. Satisfactory/Unsatisfactory Only
- 3. Repeatability
- 4. Credit by Examination
- 5. Designator Required
- 6. Special Fees
- 7. Registration Approval Type
   Department
   Instructor
- 8. Variable Title
- 9. Remedial
- 10. Honors
- 11. Full Time Privilege
- 12. Off Campus Experience

INSTRUCTIONAL TYPE:
- Lecture
- Recitation
- Presentation
- Laboratory
- Lab Prep
- Studio
- Distance
- Clinic
- Experiential
- Research
- Ind. Study
- Pract/Obser

- Minutes Per Week
- Meetings Per Week
- % of Credit Offered
- Delivery Method (Asyn., Cr. Syn.)
- Delivery Medium (Audio, Internet, Live, Text-Based, Video)

COURSE DESCRIPTION (INCLUDE REQUISITES):
Introduction to problem solving using software tools, in particular the C programming language. Prerequisites: ENGR 19500, ENGR 19600. Corequisite: ECE 26300

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