

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

|                                            |          |
|--------------------------------------------|----------|
| <b>Course ID</b> <i>Subject and Number</i> | ENGR 211 |
| <b>Date APPROVED</b>                       |          |
| <b>Date DENIED</b>                         |          |

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

|     |                                                      |                                                                                                                                                                                              |
|-----|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Course Developer                                     | Darby Hewitt                                                                                                                                                                                 |
| 2   | Course Teacher                                       | A member of the Engineering & Physics Department faculty                                                                                                                                     |
| 3   | Course Title                                         | Digital Logic Laboratory                                                                                                                                                                     |
| 4   | Course Abbreviation (if title is over 30 characters) | Digital Logic Laboratory                                                                                                                                                                     |
| 5   | College                                              | College of Arts and Sciences                                                                                                                                                                 |
| 6   | Department                                           | Engineering and Physics                                                                                                                                                                      |
| 7   | Number of Credit Hours                               | 1                                                                                                                                                                                            |
| 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       | 0                                                                                                                                                                                            |
| 11  | Maximum number of hours credit                       | 1                                                                                                                                                                                            |
| 12  | Explanation for variable credit                      | N/A                                                                                                                                                                                          |
| 13a | Course contact hours - LEC                           | 0                                                                                                                                                                                            |
| 13b | Course contact hours - Lab                           | 3                                                                                                                                                                                            |
| 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)     | This laboratory course accompanies ENGR 210 (Digital Logic), supplementing the theoretical presentation of digital logic from lecture with practical logic circuit building experience using |

|     |                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                      |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                                                                                                                                                                                                                                                                                                                                                             | tools such as, but not limited to, power supplies, digital multimeters, oscilloscopes, function generators, prototyping breadboards, discrete TTL and CMOS logic devices, and FPGAs. |
| 18  | List any prerequisites (course/s, test scores, class standing, major, etc.)                                                                                                                                                                                                                                                                                                                                 | None                                                                                                                                                                                 |
| 19  | List any co-requisites                                                                                                                                                                                                                                                                                                                                                                                      | ENGR 210 (Digital Logic)                                                                                                                                                             |
| 20  | If the course is cross listed, specify the Course ID(s) MUST have signature in Section V off all Department Chairs                                                                                                                                                                                                                                                                                          | No                                                                                                                                                                                   |
| 21  | Does this course have any special student costs? Yes/No<br><i>Attach a <u>completed</u> "Request to Add or Change Course Fees" form. Describe in section IV-F.</i>                                                                                                                                                                                                                                          | No                                                                                                                                                                                   |
| 22a | How often will it be offered? <b>Fall</b>                                                                                                                                                                                                                                                                                                                                                                   | Offered                                                                                                                                                                              |
| 22b | How often will it be offered? <b>Spring</b>                                                                                                                                                                                                                                                                                                                                                                 | As needed                                                                                                                                                                            |
| 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>                                                                                                                                                                                                             | Fall 2015                                                                                                                                                                            |
| 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 course is the laboratory component for an elective option for students interested in electrical engineering topics.                                                             |
| 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.<br/>(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 Descriptions section of the Catalog for details.)</i> | Yes. ENGR 240 – Fall 2013, Enrollment 8; ENGR 240 – Fall 2014, Enrollment 18.                                                                                                        |
| 29  | List any courses in which content                                                                                                                                                                                                                                                                                                                                                                           | None                                                                                                                                                                                 |

|  |                                                                                                                                                                             |  |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  | 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> |  |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

## II. Curriculum

|   |                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | <b>Degree Plan</b> Explanation of how this course affects degree requirements.                                     | This course fits in the menu of elective courses from which BSE students are required to take 14 hours.                                                                                                                                                                                                                                                                                                                    |
| 2 | <b>Justification</b> State the justification for adding this course to the current curriculum. Represent the need. | The course provides an in-depth introduction to digital electronic circuits, which are ubiquitous in society. Students enrolled in this course will gain hands-on experience designing, building and testing digital circuits. This course will act as a prerequisite for more advanced elective courses pertaining to embedded systems and digital design. Additionally, the class will aid in meeting ABET requirements. |

## III. Course Design

### 1. Audience and Course Goal

|   |                                                                |                                                                                                                                                                                                                                                                                                                         |
|---|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Describe the intended audience, including prerequisite skills. | BSE students with an interest in circuit design are strongly encouraged to enroll in this course as one of their electives. This course provides exposure to discrete logic design as well as the hardware description language Verilog, which is a highly sought-after skill in the digital circuit design job market. |
| 2 | State the overarching course goal(s) in performance terms.     | In this course students will learn how to construct digital circuits based on schematic diagrams, how to design and simulate digital circuits based on desired function, and how to program FPGAs using industry standard software tools.                                                                               |

## 2. Competencies and Measurements

| ABET Learning Objectives                                                                                       | Course Competencies                                                                                   | Measurement                       |
|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-----------------------------------|
| 3(a) an ability to apply knowledge of mathematics, science, and engineering                                    | Interpret electronic schematics                                                                       | notebooks, reports                |
| 3(b) an ability to design and conduct experiments, as well as to analyze and interpret data                    | Debug errantly-behaving digital circuits through the use of a digital multimeter, and/or oscilloscope | Participation, notebooks, reports |
|                                                                                                                | Design logic circuits to implement the behavior represented by a truth table                          | reports, notebooks                |
| 3(e) an ability to identify, formulate, and solve engineering problems                                         | Design logic circuits to implement the behavior represented by a truth table                          | reports, notebooks                |
| 3(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice | Implement circuits represented by schematics on a prototyping breadboard                              | participation, reports            |

## 3. Text and Resources

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

Text: *Experiments in Digital Fundamentals*, by David M. Buchla, 10<sup>th</sup> Edition, Prentice Hall, 2008, ISBN: 978-0137129652

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 211 Digital Logic Laboratory

### Primary Department

David T. Dourley  
Department Chair  
7/21/2015  
Date

Harry Smith  
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 211

Course Title: Digital Logic Laboratory

**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 X Denied \_\_\_\_\_  
 \_\_\_\_\_  
 College Dean or Director Date 4-23-15

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:**