**Purdue Northwest Curriculum Document Coversheet**

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| --- | --- | --- | --- |
| **Document No:**  (According to [Instruction](http://faculty.pnw.edu/blog/curriculum-document-approval-procedures/)s[[1]](#footnote-1)) | CES-18-25 REV PROG EE | **Approval by Faculty Senate:**  (Leave Blank) | 5/3/19 |
| **Proposed Effective Date** | Summer 2019 | **Date Reviewed by Senate Curriculum**  **Committee:**  (Leave blank) | 4/12/19 |
| **Submitting Department:**  (Name of both Dept & College/School ) | Electrical and Computer Engineering, School of Engineering, College of Engineering and Sciences | **Name(s) of Library Staff Consulted:**  (NA if not required) | NA |
| **Date Reviewed by Department** | February 13, 2019 |  |  |
| **Submission Date:**  (Date sent to College/School Curr Comm after Dept Review) |  | **Will New Library**  **Resources Used?** | **Yes** **No**  Double-click to check Yes / No. |
| **Date Reviewed by College/School Curriculum Committee** |  | **Form 40 Needed?**  (Double-click one box.)  Registrar will complete Form 40 **after** Senate approval of document. | **Yes** New courses or any course change, check **YES**  **No** For **all other** curriculum matters, check **NO**. |
| **Contact Person(s):**  (Name & Title) | David Kozel, Professor |  |  |

Unless marked “Leave blank” all parts of this form must be filled in **before** sending to Secretary of the Faculty Senate.

|  |
| --- |
| **Task (check all that apply and fill out sections appropriate for each change).**  Program/Concentration Change or New Program/Concentration Proposal: Complete Section I, III, & IV  Minor Change or New Minor Proposal: Complete Section I (delete sections III & IV)  Certificate Change or New Certificate Proposal: Complete Section I (delete sections III & IV)  Course Change or New Course Proposal: Complete Section II (delete sections III & IV) |
| **Program name**. Electrical Engineering |
| **Degree name(s).** (If applicable.) Bachelor of Science in Electrical Engineering |

## Section I: This section is for changes in programs, minors and certificates

|  |
| --- |
| **List the major changes in each program of study, minor or certificate.**  Provide more flexibility in specifying elective courses, placing restrictions on the Free Elective so pre-engineering level courses are not allowed. |
| **Impact on Students.** (State “N/A” if proposal will not greatly affect students.)  None |
| **Impact on University Resources.** (State “N/A” if proposal will not require new resources, faculty or funds.)  N/A |
| **Impact on other Academic Units.** (State “N/A” if proposal will not affect other units.)(Include name of person in affected area discussed with)  N/A |

## Section II: This section is for changes in courses only

|  |
| --- |
| **Subject.** (Brief description of proposed change, addition or deletion.) |
| **Justification.** (Briefly list main reasons for proposed change, addition or deletion.) |

Use the **Current** and **Proposed** spaces below for course changes only. Otherwise, mark “N/A”

|  |  |  |
| --- | --- | --- |
| **Current:** (Course changes: include entire present catalog information. Leave blank if new course) | | **Proposed:** (Course changes: include entire new catalog information.) |
| **Is this course also:** | **General Education** | **Currently Designated ExL (see** [**instructions[[2]](#footnote-2)**](http://faculty.pnw.edu/blog/curriculum-document-approval-procedures/)**)** |

|  |
| --- |
| **Course Objectives / Learning Outcomes.** (New courses only. List main outcomes. If lengthy, attach separate page.)  1.  2.  3. |
| **Impact on Students.** (State “N/A” if proposal will not greatly affect students.) |
| **Impact on University Resources.** (State “N/A” if proposal will not require new resources, faculty or funds.) |
| **Impact on other Academic Units.** (State “N/A” if proposal will not affect other units.) (Include name of person in affected area this was discussed with.) |

(Boxes will expand and spill over onto next page to accommodate your typing.)

***Document No: CES-18- REV PROG EE***

## Section III: PLAN OF STUDY REVISION

### Degree Name: Bachelor of Science in Electrical Engineering

### Degree Requirements

The degree requirements, i.e., the specified courses and the order taken by semester, are not changing. The only changes are in the electives. There are three changes:

1. **Electrical and Computer Engineering Electives (9 credits)**  
   As approved when the revised program was submitted, EMS 16-1:  
   Electrical and Computer Engineering Electives - 3 courses required: ECE 25100, 35400, 37100, 37500, 38000, 42600, 43200, 45100, 45400, 45900, 46400, 46810, 47600, 48300; and any ECE 49500 and above with advisor approval..  
     
   New statement:  
   Any three ECE courses selected by the student with prior approval of advisor.
2. Technical elective (3 credits)  
   As approved when the revised program was submitted, EMS 16-1:  
   Technical Elective - CHM 11600; CS 27500, 30900, 33200 or 44200; MA 31500 or 34500 or 34800 or 47200; PHYS 31100 or 32200 or 34200; STAT 34500; BUSM 33300 or BUSM 36300 or FIN 31000 or MKG 32400; any CE, ECE, ME, or MSE course 20000 or above and less than 48900 except CE 20100 (The Industrial Practice courses are not allowed); any CE, ECE, ME, MSE, or Computer Science course 48900 & above with advisor approval.  
     
   New statement:  
   1. Any Engineering (CE, ECE, ENGR, ME, or MSE) or Computer Science course 20000 or above that is required in another engineering curricula, or is an elective in any engineering curricula (and that has not been used to meet another requirement) (the Industrial Practice courses are not allowed).  
   2. Any Engineering (CE, ECE, ENGR, ME, or MSE) or Computer Science course 49500 and above with prior approval of advisor.   
   3. A list of Math, Science, and Statistics courses approved by the ECE faculty.
3. **Free elective (3 credits)**  
   As approved when the revised program was submitted, EMS 16-1:  
   There was no statement.  
     
   As appears in the current catalog:  
   Student may choose any course to fulfill this requirement.  
     
   New statement:  
   The free elective, subject to approval by the advisor, can be almost any three-or-more-credit course. Not allowed are math, science, and technology courses that are lower-level than the required courses; such as MATH 15900 or 16019, CHM 10000, PHYS 22000, ECET 20900 and 21000; and FM and MSL courses

Notes:

1. The reason for the elective changes is that the field is changing rapidly. Every time a new course is added or an older course eliminated, it should not be necessary to seek Senate approval since these are electives, not required courses.
2. The purpose of the Free Elective is to give the students some flexibility. The reason for the change is to prevent students from using pre-major level courses, such as college algebra or a lower-level science or technology or engineering course from being used.
3. Attached are the proposed program from EMS-16-1 to show what exists in complete detail, followed by the proposed with the revisions indicated in red. The revisions are only in the notes on the next to last page.

**THIS IS THE PROPOSED FROM EMS-16-1 BS Electrical Engineering-REV1**

**PROPOSED: CATALOG YEAR 2016-2017**

**College of Engineering, Mathematics, & Science**

**Degree – Bachelor of Science  
 Major: Electrical Engineering**

| **Degree Requirements** | **Details** | | |
| --- | --- | --- | --- |
| Credit Hours | 120 credit hours For example, students starting a 120 credit hour program in Fall 2016 must complete a minimum of 15 credit hours per semester/30 credit hours per academic year to earn a Bachelor’s Degree on time in 4 years and graduate by May 2020. | | |
| Grade Point Average ( GPA) | Minimum 2.0 GPA overall and 2.0 average GPA in all ECE courses | | |
| Residency Rule | Complete at least 32 hours at the 30000 or higher course level at Purdue University Calumet (PUC campus) | | |
| Experiential Learning (E X L) | 2 courses approved with the E X L attribute. E X L courses are noted by (e) next to the course title. | | |
| General Education Core | Purdue University Calumet requires a minimum of 30 credit hours in the following General Education competencies: | | |
| English Composition (6 credits); Natural Science (3 to 4 credits);  Mathematics or Statistics (3 credits);  Humanities (3 credits); | Social Science (3 credits);  Speech Communication (3 credits); Computer Utilization (3 credit hours); | Wellness Education (1 to 3 credits); Technology in Society (3 credits); Freshman Experience Course (1 to 3 credits). |
| Some courses may fulfill more than one requirement. Additional General Education coursework may be required to achieve the minimum 30 credit hours. Only courses approved by University Senate will satisfy Gen Ed Requirements. (See Course Description under Important Links on the Academic Catalog web site at <http://www.purduecal.edu/catalog/>.) | | |

**Milestone Courses noted by (m) next to the course title** **have been identified as being critical to your success in this field of study.** Failure to master the subject matter in milestone courses may impact your ability to progress in your degree program. This may entail achieving higher grades than just the minimum noted in this plan of study. Review program requirements with your academic advisor to stay on track for graduation. **E X L courses are noted by (e) next to the course title**.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SEMESTER 1 - Program Requirements (Course Title)** | **Subject Code/ Course Number** | **Semester Offered** | **Credit Hours** | **Gen Ed** | **Min Grade** | **Notes** | **Also Allowed** | **Pre/Co-requisite Courses** |
| Integrated Calculus and Analytic Geometry I (m) | MA 16300 (m) | FA, SP | 5 | Yes | C |  |  | MA 15100 or MA 15900 or MA 15400 |
| General Chemistry | CHM 11500 | FA, SP | 4 | Yes |  |  |  | MA 15300 |
| Fundamentals of Speech | COM 11400 | FA, SP | 3 | Yes |  |  |  |  |
| First year Seminar for Engineers | ENGR 18600 | FA | 1 | Yes |  |  |  |  |
| Elementary Engineering Design | ENGR 19000 | FA | 2 |  |  |  |  | MA 15900 |

| **SEMESTER 2 - Program Requirements (Course Title)** | **Subject Code/ Course Number** | **Semester Offered** | **Credit Hours** | **Gen Ed** | **Min Grade** | **Notes** | **Also Allowed** | **Pre/Co-requisite Courses** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Integrated Calculus and Analytic Geometry II (m) | MA 16400 (m) | FA, SP | 5 |  | C |  |  | MA 16300 |
| Mechanics (m) | PHYS 15200 (m) | FA, SP | 4 | Yes | C |  |  | MA 16300 |
| English Composition I | ENGL 10400 | FA, SP | 3 | Yes |  |  | ENGL 10000 ENGL 10800 | High School Grades |
| Software Tools for Engineers | ENGR 15100 | SP | 3 | Yes | C |  |  | Pre/Co-requisite: MA 16300 |

| **SEMESTER 3 - Program Requirements (Course Title)** | **Subject Code/ Course Number** | **Semester Offered** | **Credit Hours** | **Gen Ed** | **Min Grade** | **Notes** | **Also Allowed** | **Pre/Co-requisite Courses** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Multivariate Calculus (m) | MA 26100 (m) | FA, SP | 4 |  | C |  |  | MA 16400 |
| Electricity Optics | PHYS 26100 | FA, SP | 4 |  | C |  |  | PHYS 15200 and MA 16400 |
| Linear Circuit Analysis I (m) | ECE 20100 (m) | FA | 3 |  | C |  |  | MA 16400 and PHYS 15200; Pre/Co-req: ECE 20700 |
| Electronic Meas. Techniques | ECE 20700 | FA | 1 |  | C |  |  | Pre/Co-requisite: ECE 20100 |
| Programming for Engineers | ECE 15200 | FA | 3 |  | C |  |  | ENGR 15100 |

| **SEMESTER 4 - Program Requirements (Course Title)** | **Subject Code/ Course Number** | **Semester Offered** | **Credit Hours** | **Gen Ed** | **Min Grade** | **Notes** | **Also Allowed** | **Pre/Co-requisite Courses** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Differential Equations | MA 26400 | FA, SP | 3 |  | C |  |  | MA 26100 |
| Linear Circuit Analysis II (m) | ECE 20200 (m) | SP | 3 |  | C |  |  | ECE 20100, ECE 20700, and MA 26100; |
| Intro to Digital System Design | ECE 27001 | SP | 4 |  | C |  |  | ECE 15200 and 20100 and 20700 |
| Analog and Digital Electronics | ECE 27500 | SP | 4 |  |  |  |  | ECE 20100 and ECE 20700. Pre/Co-req ECE 20200 |

| **SEMESTER 5 - Program Requirements (Course Title)** | **Subject Code/ Course Number** | **Semester Offered** | **Credit Hours** | **Gen Ed** | **Min Grade** | **Notes** | **Also Allowed** | **Pre/Co-requisite Courses** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Signals and Systems | ECE 30100 | FA | 3 |  |  |  |  | ECE 20200 and MA 26400, Pre/Co-requisite ECE 30101 |
| Signals and Systems Lab | ECE 30001 | FA | 1 |  |  |  |  | Pre/Co-requisite ECE 30100 |
| Engineering Project Management | ECE 31200 | FA | 3 |  |  |  |  |  |
| Microprocessor System Design & Interfacing | ECE 36201 | FA | 4 |  |  |  |  | ECE 27001 |
| Linear Algebra | MA 26500 | FA, SP | 3 |  |  |  |  | MA 16400 |

| **SEMESTER 6 - Program Requirements (Course Title)** | **Subject Code/ Course Number** | **Semester Offered** | **Credit Hours** | **Gen Ed** | **Min Grade** | **Notes** | **Also Allowed** | **Pre/Co-requisite Courses** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Probabilistic Methods in Electrical Engineering | ECE 30200 | SP | 3 |  |  |  |  | ECE 20200; Pre/Co-requisite: ECE 30100 |
| Linear Control Systems | ECE 38400 | SP | 4 |  |  |  |  | ECE 30100 |
| Written/Oral Communication for Engineers | COM/ENGL 30700 | FA, SP | 3 | Yes |  |  |  | ENGL 10400 or 10000 or 10800, COM 11400, and ECE 20200 with “C” minimum grade |
| Engineering Elective | ME 27100 or  ME 30500 or  MSE 20000 | FA  SP  SP | 3 |  |  |  |  |  |
| Electric and Computer Engineering Elective | See Note 2 | FA, SP | 3 |  |  |  |  |  |

| **SEMESTER 7 - Program Requirements (Course Title)** | **Subject Code/ Course Number** | **Semester Offered** | **Credit Hours** | **Gen Ed** | **Min Grade** | **Notes** | **Also Allowed** | **Pre/Co-requisite Courses** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Electric and Magnetic Fields | ECE 31100 | FA | 3 |  |  |  |  | MA 26400 and PHYS 26100 |
| Senior Engineering Design I (e) | ECE 42900 (e) | FA, SP | 3 |  |  |  |  | See Note 1 |
| Intro to Communication Theory | ECE 44800 | FA | 4 |  |  |  |  | ECE 27500, ECE 30100, and ECE 30200 |
| Electric and Computer Engineering Elective | See Note 2 | FA, SP | 3 |  |  |  |  |  |
| Social Science Elective | Any Gen Ed approved Social Science course | FA, SP | 3 |  |  |  |  |  |

| **SEMESTER 8 - Program Requirements (Course Title)** | **Subject Code/ Course Number** | **Semester Offered** | **Credit Hours** | **Gen Ed** | **Min Grade** | **Notes** | **Also Allowed** | **Pre/Co-requisite Courses** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Senior Engineering Design II (e) | ECE 43900 (e) | FA, SP | 3 |  |  |  |  | ECE 42900 |
| Electric and Computer Engineering Elective | See Note 2 | FA, SP | 3 |  |  |  |  |  |
| Technical Elective | See Note 3 | FA, SP | 3 |  |  |  |  |  |
| Free Elective |  | FA, SP | 3 |  |  |  |  |  |
| Ethics for the Professions | PHIL 32400 Note 4 | FA, SP | 3 | Yes |  |  |  |  |
| **Program Total** |  |  | **120** |  |  |  |  |  |

*Additional Information and Guidelines*

Note 1: Senior Engineering Design I: Prerequisite Courses - COM/ENGL 30700 and ECE 27500 and ECE 31200 and ECE 362XX, Penultimate semester, Pre/Co-requisite: ECE 38400.

Note 2: Electrical and Computer Engineering Electives - 3 courses required: ECE 25100, 35400, 37100, 37500, 38000, 42600, 43200, 45100, 45400, 45900, 46400, 46810, 47600, 48300; and any ECE 49500 and above with advisor approval.

Note 3: Technical Elective - CHM 11600; CS 27500, 30900, 33200 or 44200; MA 31500 or 34500 or 34800 or 47200; PHYS 31100 or 32200 or 34200; STAT 34500; BUSM 33300 or BUSM 36300 or FIN 31000 or MKG 32400; any CE, ECE, ME, or MSE course 20000 or above and less than 48900 except CE 20100 (The Industrial Practice courses are not allowed); any CE, ECE, ME, MSE, or Computer Science course 48900 & above with advisor approval.

Note 4: Ethics for the Professions, PHIL 32400 - Please use section reserved for engineering students.

Students who do not receive a grade in a required ECE course that meets the minimum or better required for their plan of study in three attempts, including grades of W, will not be allowed to continue in Electrical or Computer Engineering programs.

Continuing students cannot transfer in credit for a required ECE course without prior approval of the Undergraduate Committee.

Students may elect to add a concentration in Mechatronics, Power and Energy Systems, or Bioinstrumentation. These requirements can be accommodated using the Electrical and Computer Engineering, Engineering, Technical, and Free Electives. See attached concentration course requirements. Contact your academic advisor for more information.

*Resources*

**The 8 semester plan of study is a recommended sequence of classes designed to show how this program can be completed within four years.** Visit [www.15toFinishIndiana.org](http://www.15toFinishIndiana.org) for information and resources.

**To learn more about this program**, go to <http://www.purduecal.edu/catalog/> and select the appropriate academic department.

**For career information**, check out “What Can I Do With this Major?” at <http://www.purduecal.edu/careerservices/majors/default.html>

**For Financial Aid eligibility,** go to <http://webs.purduecal.edu/ofasa/financial-aid/eligibility-for-financial-aid/>. Annual FAFSA filing deadline is March 10. Financial Aid recipients are required to complete 30 credits per calendar year to stay eligible for the standard financial aid award.

**Financial Guarantee:** If you follow the degree map and find a course unavailable, you may be able to take the course for free in a future semester. Certain exclusions apply. Please see guidelines at <http://webs.purduecal.edu/consumer-information/> .

**Degree Works** **allows you to track your progress toward degree completion**. Students are also encouraged to use the Planner tool in Degree Works in consultation with their academic advisor to build an academic plan that leads to on-time graduation. To access your program requirements in Degree Works, go to [https://mypuc.purduecal.edu](https://mypuc.purduecal.edu/cp/home/displaylogin) & log in to myPUC portal with your username & password. Find Degree Works in the Degree Works/Advising Information tab in myPUC.

 **Major: ECEB Conc: none CIP: 141001 Program: EENGR-BSEE Catalog Year: 2015-16 Revised 5/20/2015**

**BSEE – Electrical Engineering Concentrations**

Students may elect to add a concentration in Mechatronics, Power and Energy Systems, or Bioinstrumentation. These requirements can be accommodated using the Electrical and Computer Engineering, Engineering/Science, and Technical Electives in the Electrical Engineering major. Consult your academic advisor for more information on course requirements and availability. The web site for BSEE concentrations is <http://webs.purduecal.edu/ece/electrical-engineering-electives-by-interest-area/>.

**Bioinstrumentation**

|  |  |  |
| --- | --- | --- |
| Course Code | Title | Credit Hours |
| ME 27100 | Basic Mechanics I: Statics | 3 |
| ECE 47600 | Digital Signal Processing | 3 |
| ECE 50600 | Biomedical Instrumentation Design | 3 |
| ECE 50700 | Introduction to Biomedical Imaging | 3 |
| Choose 1:  ECE 55400 or  ECE 56900 or  ECE 59500 | Electronic Instrumentation and Control Circuits or  Introduction to Robotic Systems or  Digital Image Processing | 3  3  3 |
| Choose 1:  BIOL 10100 or  BIOL 21300 | Introductory Biology or  Human Anatomy and Physiology I | 4  4 |

**Mechatronics**

|  |  |  |
| --- | --- | --- |
| Course Code | Title | Credit Hours |
| ME 27100 | Basic Mechanics I: Statics | 3 |
| ME 27500 | Basic Mechanics II: Dynamics | 3 |
| ME 32500 | Dynamics of Physical Systems | 3 |
| ECE 38000 | Computers in Engineering Analysis | 3 |
| ECE 42600 | Electric Drives | 3 |
| Choose 1:  ECE 45100 or  ECE 48300 or  ME 30500 or  ME 32000 | Industrial Automation or  Digital Control Systems – Analysis and Design or  General Thermodynamics I or  Kinematic Analysis and Design | 3  3  3  3 |

**Power and Energy**

|  |  |  |
| --- | --- | --- |
| Course Code | Title | Credit Hours |
| ECE 42600 | Electronic Drives | 3 |
| ECE 43200 | Power Systems | 3 |
| ECE 42301 | Power Electronics | 3 |
| Choose 1:  ME 27100 or  ME 30500 or  MSE 20000 | Basic Mechanics I: Statics or  General Thermodynamics I or  Materials Science | 3  3  3 |
| Choose 2:  ECE 45100 or  ECE 48300 or  ECE 50900 or  ME 27100 or  ME 30500 or  ME 30600 | Industrial Automation or  Digital Control Systems – Analysis and Design or  Advanced Electronic Drives or  Basic Mechanics I: Statics or  General Thermodynamics I or  General Thermodynamics II | 3  3  3  3  3  3 |

**THIS IS THE PROPOSED REVISIONS (changes marked in red)**

**College of Engineering, Mathematics, & Science**

**Degree – Bachelor of Science  
 Major: Electrical Engineering**

| **Degree Requirements** | **Details** | | |
| --- | --- | --- | --- |
| Credit Hours | 120 credit hours For example, students starting a 120 credit hour program in Fall 2016 must complete a minimum of 15 credit hours per semester/30 credit hours per academic year to earn a Bachelor’s Degree on time in 4 years and graduate by May 2020. | | |
| Grade Point Average ( GPA) | Minimum 2.0 GPA overall and 2.0 average GPA in all ECE courses | | |
| Residency Rule | Complete at least 32 hours at the 30000 or higher course level at Purdue University Calumet (PUC campus) | | |
| Experiential Learning (E X L) | 2 courses approved with the E X L attribute. E X L courses are noted by (e) next to the course title. | | |
| General Education Core | Purdue University Calumet requires a minimum of 30 credit hours in the following General Education competencies: | | |
| English Composition (6 credits); Natural Science (3 to 4 credits);  Mathematics or Statistics (3 credits);  Humanities (3 credits); | Social Science (3 credits);  Speech Communication (3 credits); Computer Utilization (3 credit hours); | Wellness Education (1 to 3 credits); Technology in Society (3 credits); Freshman Experience Course (1 to 3 credits). |
| Some courses may fulfill more than one requirement. Additional General Education coursework may be required to achieve the minimum 30 credit hours. Only courses approved by University Senate will satisfy Gen Ed Requirements. (See Course Description under Important Links on the Academic Catalog web site at <http://www.purduecal.edu/catalog/>.) | | |

**Milestone Courses noted by (m) next to the course title** **have been identified as being critical to your success in this field of study.** Failure to master the subject matter in milestone courses may impact your ability to progress in your degree program. This may entail achieving higher grades than just the minimum noted in this plan of study. Review program requirements with your academic advisor to stay on track for graduation. **E X L courses are noted by (e) next to the course title**.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SEMESTER 1 - Program Requirements (Course Title)** | **Subject Code/ Course Number** | **Semester Offered** | **Credit Hours** | **Gen Ed** | **Min Grade** | **Notes** | **Also Allowed** | **Pre/Co-requisite Courses** |
| Integrated Calculus and Analytic Geometry I (m) | MA 16300 (m) | FA, SP | 5 | Yes | C |  |  | MA 15100 or MA 15900 or MA 15400 |
| General Chemistry | CHM 11500 | FA, SP | 4 | Yes |  |  |  | MA 15300 |
| Fundamentals of Speech | COM 11400 | FA, SP | 3 | Yes |  |  |  |  |
| First year Seminar for Engineers | ENGR 18600 | FA | 1 | Yes |  |  |  |  |
| Elementary Engineering Design | ENGR 19000 | FA | 2 |  |  |  |  | MA 15900 |

| **SEMESTER 2 - Program Requirements (Course Title)** | **Subject Code/ Course Number** | **Semester Offered** | **Credit Hours** | **Gen Ed** | **Min Grade** | **Notes** | **Also Allowed** | **Pre/Co-requisite Courses** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Integrated Calculus and Analytic Geometry II (m) | MA 16400 (m) | FA, SP | 5 |  | C |  |  | MA 16300 |
| Mechanics (m) | PHYS 15200 (m) | FA, SP | 4 | Yes | C |  |  | MA 16300 |
| English Composition I | ENGL 10400 | FA, SP | 3 | Yes |  |  | ENGL 10000 ENGL 10800 | High School Grades |
| Software Tools for Engineers | ENGR 15100 | SP | 3 | Yes | C |  |  | Pre/Co-requisite: MA 16300 |

| **SEMESTER 3 - Program Requirements (Course Title)** | **Subject Code/ Course Number** | **Semester Offered** | **Credit Hours** | **Gen Ed** | **Min Grade** | **Notes** | **Also Allowed** | **Pre/Co-requisite Courses** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Multivariate Calculus (m) | MA 26100 (m) | FA, SP | 4 |  | C |  |  | MA 16400 |
| Electricity Optics | PHYS 26100 | FA, SP | 4 |  | C |  |  | PHYS 15200 and MA 16400 |
| Linear Circuit Analysis I (m) | ECE 20100 (m) | FA | 3 |  | C |  |  | MA 16400 and PHYS 15200; Pre/Co-req: ECE 20700 |
| Electronic Meas. Techniques | ECE 20700 | FA | 1 |  | C |  |  | Pre/Co-requisite: ECE 20100 |
| Programming for Engineers | ECE 15200 | FA | 3 |  | C |  |  | ENGR 15100 |

| **SEMESTER 4 - Program Requirements (Course Title)** | **Subject Code/ Course Number** | **Semester Offered** | **Credit Hours** | **Gen Ed** | **Min Grade** | **Notes** | **Also Allowed** | **Pre/Co-requisite Courses** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Differential Equations | MA 26400 | FA, SP | 3 |  | C |  |  | MA 26100 |
| Linear Circuit Analysis II (m) | ECE 20200 (m) | SP | 3 |  | C |  |  | ECE 20100, ECE 20700, and MA 26100; |
| Intro to Digital System Design | ECE 27001 | SP | 4 |  | C |  |  | ECE 15200 and 20100 and 20700 |
| Analog and Digital Electronics | ECE 27500 | SP | 4 |  |  |  |  | ECE 20100 and ECE 20700. Pre/Co-req ECE 20200 |

| **SEMESTER 5 - Program Requirements (Course Title)** | **Subject Code/ Course Number** | **Semester Offered** | **Credit Hours** | **Gen Ed** | **Min Grade** | **Notes** | **Also Allowed** | **Pre/Co-requisite Courses** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Signals and Systems | ECE 30100 | FA | 3 |  |  |  |  | ECE 20200 and MA 26400, Pre/Co-requisite ECE 30101 |
| Signals and Systems Lab | ECE 30001 | FA | 1 |  |  |  |  | Pre/Co-requisite ECE 30100 |
| Engineering Project Management | ECE 31200 | FA | 3 |  |  |  |  |  |
| Microprocessor System Design & Interfacing | ECE 36201 | FA | 4 |  |  |  |  | ECE 27001 |
| Linear Algebra | MA 26500 | FA, SP | 3 |  |  |  |  | MA 16400 |

| **SEMESTER 6 - Program Requirements (Course Title)** | **Subject Code/ Course Number** | **Semester Offered** | **Credit Hours** | **Gen Ed** | **Min Grade** | **Notes** | **Also Allowed** | **Pre/Co-requisite Courses** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Probabilistic Methods in Electrical Engineering | ECE 30200 | SP | 3 |  |  |  |  | ECE 20200; Pre/Co-requisite: ECE 30100 |
| Linear Control Systems | ECE 38400 | SP | 4 |  |  |  |  | ECE 30100 |
| Written/Oral Communication for Engineers | COM/ENGL 30700 | FA, SP | 3 | Yes |  |  |  | ENGL 10400 or 10000 or 10800, COM 11400, and ECE 20200 with “C” minimum grade |
| Engineering Elective | ME 27100 or  ME 30500 or  MSE 20000 | FA  SP  SP | 3 |  |  |  |  |  |
| Electric and Computer Engineering Elective | See Note 2 | FA, SP | 3 |  |  |  |  |  |

| **SEMESTER 7 - Program Requirements (Course Title)** | **Subject Code/ Course Number** | **Semester Offered** | **Credit Hours** | **Gen Ed** | **Min Grade** | **Notes** | **Also Allowed** | **Pre/Co-requisite Courses** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Electric and Magnetic Fields | ECE 31100 | FA | 3 |  |  |  |  | MA 26400 and PHYS 26100 |
| Senior Engineering Design I (e) | ECE 42900 (e) | FA, SP | 3 |  |  |  |  | See Note 1 |
| Intro to Communication Theory | ECE 44800 | FA | 4 |  |  |  |  | ECE 27500, ECE 30100, and ECE 30200 |
| Electric and Computer Engineering Elective | See Note 2 | FA, SP | 3 |  |  |  |  |  |
| Social Science Elective | Any Gen Ed approved Social Science course | FA, SP | 3 |  |  |  |  |  |

| **SEMESTER 8 - Program Requirements (Course Title)** | **Subject Code/ Course Number** | **Semester Offered** | **Credit Hours** | **Gen Ed** | **Min Grade** | **Notes** | **Also Allowed** | **Pre/Co-requisite Courses** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Senior Engineering Design II (e) | ECE 43900 (e) | FA, SP | 3 |  |  |  |  | ECE 42900 |
| Electric and Computer Engineering Elective | See Note 2 | FA, SP | 3 |  |  |  |  |  |
| Technical Elective | See Note 3 | FA, SP | 3 |  |  |  |  |  |
| Free Elective | See Note 5 | FA, SP | 3 |  |  |  |  |  |
| Ethics for the Professions | PHIL 32400 Note 4 | FA, SP | 3 | Yes |  |  |  |  |
| **Program Total** |  |  | **120** |  |  |  |  |  |

*Additional Information and Guidelines*

Note 1: Senior Engineering Design I: Prerequisite Courses - COM/ENGL 30700 ~~and ECE 27500~~ and ECE 31200. ~~and ECE 362XX, Penultimate semester, Pre/Co-requisite: ECE 38400~~. Department permission required. (Changes previously approved, taken from the current online course description.)

Note 2: Electrical and Computer Engineering Electives - Any three ECE courses selected by the student with prior approval of advisor.

Note 3: Technical Elective - 1. Any Engineering (CE, ECE, ENGR, ME, or MSE) or Computer Science course 20000 or above that is required in another engineering curricula, or is an elective in any engineering curricula (and that has not been used to meet another requirement) (the Industrial Practice courses are not allowed).  
2. Any Engineering (CE, ECE, ENGR, ME, or MSE) or Computer Science course 49500 and above with prior approval of advisor.   
3. A list of Math, Science, and Statistics courses approved by the ECE faculty.

Note 4: Ethics for the Professions, PHIL 32400 - Please use section reserved for engineering students.

Note 5: The free elective, subject to approval by the advisor, can be almost any three-or-more-credit course. Not allowed are math, science, and technology courses that are lower-level than the required courses; such as MATH 15900 or 16019, CHM 10000, PHYS 22000, ECET 20900 and 21000; and FM and MSL courses.

Students who do not receive a grade in a required ECE course that meets the minimum or better required for their plan of study in three attempts, including grades of W, will not be allowed to continue in Electrical or Computer Engineering programs.

Continuing students cannot transfer in credit for a required ECE course without prior approval of the Undergraduate Committee.

Students may elect to add a concentration in Mechatronics, Power and Energy Systems, or Bioinstrumentation. These requirements can be accommodated using the Electrical and Computer Engineering, Engineering, Technical, and Free Electives. See attached concentration course requirements. Contact your academic advisor for more information.

*Resources*

**The 8 semester plan of study is a recommended sequence of classes designed to show how this program can be completed within four years.** Visit [www.15toFinishIndiana.org](http://www.15toFinishIndiana.org) for information and resources.

**To learn more about this program**, go to <http://www.purduecal.edu/catalog/> and select the appropriate academic department.

**For career information**, check out “What Can I Do With this Major?” at <http://www.purduecal.edu/careerservices/majors/default.html>

**For Financial Aid eligibility,** go to <http://webs.purduecal.edu/ofasa/financial-aid/eligibility-for-financial-aid/>. Annual FAFSA filing deadline is March 10. Financial Aid recipients are required to complete 30 credits per calendar year to stay eligible for the standard financial aid award.

**Financial Guarantee:** If you follow the degree map and find a course unavailable, you may be able to take the course for free in a future semester. Certain exclusions apply. Please see guidelines at <http://webs.purduecal.edu/consumer-information/> .

**Degree Works** **allows you to track your progress toward degree completion**. Students are also encouraged to use the Planner tool in Degree Works in consultation with their academic advisor to build an academic plan that leads to on-time graduation. To access your program requirements in Degree Works, go to [https://mypuc.purduecal.edu](https://mypuc.purduecal.edu/cp/home/displaylogin) & log in to myPUC portal with your username & password. Find Degree Works in the Degree Works/Advising Information tab in myPUC.

 **Major: ECEB Conc: none CIP: 141001 Program: EENGR-BSEE Catalog Year: 2015-16 Revised 5/20/2015**

**BSEE – Electrical Engineering Concentrations**

Students may elect to add a concentration in Mechatronics, Power and Energy Systems, or Bioinstrumentation. These requirements can be accommodated using the Electrical and Computer Engineering, Engineering/Science, and Technical Electives in the Electrical Engineering major. Consult your academic advisor for more information on course requirements and availability. The web site for BSEE concentrations is <http://webs.purduecal.edu/ece/electrical-engineering-electives-by-interest-area/>.

**Bioinstrumentation**

|  |  |  |
| --- | --- | --- |
| Course Code | Title | Credit Hours |
| ME 27100 | Basic Mechanics I: Statics | 3 |
| ECE 47600 | Digital Signal Processing | 3 |
| ECE 50600 | Biomedical Instrumentation Design | 3 |
| ECE 50700 | Introduction to Biomedical Imaging | 3 |
| Choose 1:  ECE 55400 or  ECE 56900 or  ECE 59500 | Electronic Instrumentation and Control Circuits or  Introduction to Robotic Systems or  Digital Image Processing | 3  3  3 |
| Choose 1:  BIOL 10100 or  BIOL 21300 | Introductory Biology or  Human Anatomy and Physiology I | 4  4 |

**Mechatronics**

|  |  |  |
| --- | --- | --- |
| Course Code | Title | Credit Hours |
| ME 27100 | Basic Mechanics I: Statics | 3 |
| ME 27500 | Basic Mechanics II: Dynamics | 3 |
| ME 32500 | Dynamics of Physical Systems | 3 |
| ECE 38000 | Computers in Engineering Analysis | 3 |
| ECE 42600 | Electric Drives | 3 |
| Choose 1:  ECE 45100 or  ECE 48300 or  ME 30500 or  ME 32000 | Industrial Automation or  Digital Control Systems – Analysis and Design or  General Thermodynamics I or  Kinematic Analysis and Design | 3  3  3  3 |

**Power and Energy**

|  |  |  |
| --- | --- | --- |
| Course Code | Title | Credit Hours |
| ECE 42600 | Electronic Drives | 3 |
| ECE 43200 | Power Systems | 3 |
| ECE 42301 | Power Electronics | 3 |
| Choose 1:  ME 27100 or  ME 30500 or  MSE 20000 | Basic Mechanics I: Statics or  General Thermodynamics I or  Materials Science | 3  3  3 |
| Choose 2:  ECE 45100 or  ECE 48300 or  ECE 50900 or  ME 27100 or  ME 30500 or  ME 30600 | Industrial Automation or  Digital Control Systems – Analysis and Design or  Advanced Electronic Drives or  Basic Mechanics I: Statics or  General Thermodynamics I or  General Thermodynamics II | 3  3  3  3  3  3 |

1. <http://faculty.pnw.edu/blog/curriculum-document-approval-procedures/> [↑](#footnote-ref-1)
2. <http://faculty.pnw.edu/blog/curriculum-document-approval-procedures/> [↑](#footnote-ref-2)