TO: The Faculty of the College of Engineering

FROM: The Faculty of the School of Electrical and Computer Engineering

RE: Change in degree requirements for the Bachelor of Science in Electrical Engineering (B.S.EE) effective for students entering Purdue Fall 2013 and later.

The faculty of the School of Electrical and Computer Engineering has approved the following change in the B.S.EE degree requirements. This action is now submitted to the Engineering Faculty with a recommendation for approval.

From: see pages 2-3

To: see pages 4-5

Reason: A change in the degree requirements is necessary to accommodate the new College of Engineering General Education Program (EFD 43-13). In addition, a residency requirement for ECE courses (this has been a long-standing ECE policy) has been formally included. No change in the sample Plan-of-Study is needed as a result of these changes.

On behalf of V. Balakrishnan, Head
School of Electrical and Computer Engineering

APPROVED FOR THE FACULTY
OF THE SCHOOLS OF ENGINEERING
BY THE ENGINEERING
CURRICULUM COMMITTEE

ECC Minutes #13

Date 5/10/2013

Chairman ECC

BSEE Degree Minimum Requirements

Introduction

The Bachelor of Science in Electrical Engineering degree requires a total of 124 credit hours and a minimum Graduation Index of 2.0. Students must qualify for admission into the School of Electrical and Computer Engineering by completion of the First-Year Engineering Program.

ECE Requirements (47 credit hours):

EE Core Curriculum (24 credit hours): ECE 20100, 20200, 20700, 20800, 25500, 27000, 30100, 30200, and 31100.

ECE Seminars (1 credit hour): ECE 20000 and 40000.

Advanced EE Selectives (9 - 11 credit hours): Choose three (3) of the following: ECE 30500, 32100, 36200, 38200, 43800 and 44000. Choose 4 if both ECE 43800 and 44000 selected. ECE 36200, 43800, and 44000 also contribute to satisfaction of the ECE Upper Level Laboratory Requirement described below.

Senior Design Requirement (3-4 credit hours): ECE 40200, 47700 (taken in one semester) or at least 3 credit hours of EPCS 41100/41200 (taken over 2 consecutive semesters). A prerequisite for all Senior Design courses is completion of the EE Core Curriculum. Some Senior Design Courses may have additional prerequisites. When used to satisfy the Senior Design Requirement, these courses cannot also be used to satisfy the ECE Laboratory Requirement below.

ECE Electives (7-10 credit hours): Additional ECE courses to bring total ECE credit hours to at least 47, including at least three (3) Upper-Level Laboratory courses. There are some restrictions on the use of *Special Content Courses* towards the ECE Requirements. Students are advised to refer to *Suggestions for Choosing ECE Electives for the BSEE Degree*.

> ***ECE Laboratory Requirement:*** *Three (3) ECE Upper-Level Laboratory courses or ECE courses with laboratory components in addition to those required as part of the EE Core Curriculum (ECE 20700, 20800, and 27000). Courses with laboratory components taken as Advanced EE Selectives, ECE 36200, 43800 and 44000, also contribute to this requirement. No more than two (2) may be "EE Special Content" courses: ECE 39600, 49600 (not taken at the same time as ECE Sophomore level courses (ECE 20100, 20200, 20700, 20800, 25500, and 27000), 27900/37900/47900 VIP, EPCS (Excluding Senior Design) and others as designated by the ECE Curriculum Committee.*

Major-Area GPA: A GPA of 2.0 or higher in the ECE courses taken to satisfy the ECE Requirements is required to qualify for graduation with the BSEE degree.

General Engineering (7-9 credit hours):

Introduction to Engineering (4-6 credit hours): ENGR 19500/13100 (Transforming Ideas to Innovation I) & ENGR 19500/13200 (Transforming Ideas to Innovation II) **OR** ENGR 19500 (Creativity & Innovation in Engineering I) & ENGR 19500 (Creativity & Innovation in Engineering II) **OR** ENGR 10000 (First-Year Engineering Lectures) & ENGR 12600 (Engineering Problem Solving and Computer Tools)

Engineering Breadth Requirement (3 credit hours): Choose one (1) course from the approved *Engineering Breadth Requirement* list.

Mathematics Requirement (18-19 credit hours):

Choose one of the Math options below. If MA 16100 and/or MA 16200 are taken in place of MA 16500 and/or MA 16600, only 4 of the 5 credit hours for each course can be applied to degree requirements.

Option 1 (18 credits hours): MA 16500, 16600, 26100, 26600, and 26500.

Option 2 (19 credit hours): MA 16500, 16600, 26100, 26200, and one of: MA 30300, 30400, 35100, 36200, 38500, 42500, 51000, or CS 31400.

Science Requirement (18-22 credit hours):

CS 15900, CHM 11500/12300, PHYS 17200, and PHYS 27200 and one of the **Science Selectives**: BIOL 11000, BIOL 11100, CHM 11600/12400, PHYS 31000, PHYS 32200, PHYS 34200.

Liberal Arts Requirement (24-25 credit hours):

Communication Skills (6-7 credit hours): ENGL 10600 or 10008 and COM 11400.

General Education Program Requirement (18 credit hours): Students must satisfy the requirements of the *General Education Program*.

Complementary Electives (8-11 credit hours):

Additional courses to bring the total to at least 124 credit hours. These courses should be selected to enhance the students academic program. These courses may include ECE courses beyond those required to complete the ECE Requirements or additional mathematics, science, engineering, and liberal arts courses. See *Guidelines for Complementary Electives* for more information about the types of courses that are acceptable as Complementary Electives.

BSEE Degree Minimum Requirements

The Bachelor of Science in Electrical Engineering degree requires a total of 124 credit hours and a minimum Graduation Index of 2.0. Students must qualify for admission into the School of Electrical and Computer Engineering by completion of the First-Year Engineering Program with an eligible EAI and GPA, qualifying for Change-of-degree-objective (CODO) to ECE, or meeting ECE transfer requirements.

ECE Requirements (47 credit hours):

EE Core Curriculum (24 credit hours): ECE 20100, 20200, 20700, 20800, 25500, 27000, 30100, 30200, and 31100.

ECE Seminars (1 credit hour): ECE 20000 and 40000.

Advanced EE Selectives (9 - 11 credit hours): Choose three (3) of the following: ECE 30500, 32100, 36200, 38200, 43800 and 44000. Choose 4 if both ECE 43800 and 44000 selected. ECE 36200, 43800, and 44000 also contribute to satisfaction of the ECE Upper Level Laboratory Requirement described below.

Senior Design Requirement (3-4 credit hours): ECE 40200 or 47700 (taken in one semester) or at least 3 credit hours of EPCS 41100/41200 (taken over 2 consecutive semesters). A prerequisite for all Senior Design courses is completion of the EE Core Curriculum. Some Senior Design Courses may have additional prerequisites. When used to satisfy the Senior Design Requirement, these courses cannot also be used to satisfy the ECE Laboratory Requirement below.

ECE Electives (7-10 credit hours): Additional ECE courses to bring total ECE credit hours to at least 47, including at least three (3) Upper-Level Laboratory courses. No more than 6 credit hours of *EE Special Content* courses can be used towards the 47 credit hours of ECE Requirements.

ECE Laboratory Requirement: Three (3) ECE Upper-Level (30000 and above) Laboratory courses or ECE courses with laboratory components in addition to those required as part of the EE Core Curriculum (ECE 20700, 20800, and 27000). Courses with laboratory components taken as Advanced EE Selectives (ECE 36200, 43800 and 44000) also contribute to the laboratory requirement. No more than two (2) of these labs may be *EE Special Content* courses.

Additional Requirements: A GPA of 2.0 or higher in the ECE courses taken to satisfy these 47 credit hours is required to qualify for graduation with the BSEE degree. In addition, at least 32 credit hours and all 30000 level and above courses applied to these 47 credit hours must be completed on the Purdue West Lafayette campus.

General Engineering (10 credit hours):

Introduction to Engineering (7 credit hours): ENGR 13100, ENGR 13200, & CS 15900 OR ENGR 14100 & ENGR 14200.

Engineering Breadth Requirement (3 credit hours): Choose one (1) course from the approved *ECE Engineering Breadth Requirement* list.

Mathematics Requirement (18-19 credit hours):

Choose one of the Math options below. If MA 16100 and/or MA 16200 are taken in place of MA 16500 and/or MA 16600, only 4 of the 5 credit hours for each course can be applied to degree requirements.

Option 1 (18 credits hours): MA 16500, 16600, 26100, 26600, and 26500.

Option 2 (19 credit hours): MA 16500, 16600, 26100, 26200, and one course from the approved *ECE Advanced Math Electives* list.

Science Requirement (15-16 credit hours):

CHM 11500/12300, PHYS 17200, and PHYS 27200 and one Science Selective from the approved *ECE Science Selective* list.

College of Engineering General Education Program (24 credit hours):

Students must satisfy the requirements of the *College of Engineering General Education Program.* This requirement has two components:

- *Foundational Learning Outcomes:* select from courses approved by the Undergraduate Curriculum Council for the pertinent learning outcomes.
- *Programmatic Requirement:* select from courses approved by the ECE Curriculum Committee.

Complementary Electives (8-10 credit hours):

Additional courses to bring the total credit hours to at least 124 credit hours. These courses should be selected to enhance the student's academic program and must be selected from the approved list of *ECE Complementary Electives.*

Sample Plan-of-Study for BSEE

First Year

Semester 1			Semester 2		
ENGR 13100	Transf Ideas to Innov I	2	ENGR 13200	Transf Ideas to Innov II	2
MA 16500	Analytc Geom & Calc I	4	MA 16600	Analytc Geom & Calc II	4
CHM 11500	General Chemistry	4	CS 15900	C Programming For Engr	3
PHYS 17200	Modern Mechanics	4	Sci Sel	Science Selective	4
COM 11400	Fundament Of Speech	3	ENGL 10600	First-Year Composition	4
	Semester Credits = 17			*Semester Credits* = 17	

Sophomore Year

Semester 3			Semester 4		
ECE 20000	Elec & Comptr Engr Sem	0	ECE 20200	Linear Circuit Anly II	3
ECE 20100	Linear Circuit Anly I	3	ECE 25500	Intr Electron Anly Des	3
ECE 20700	Elect Measur Technique	1	ECE 20800	Electron Dev & Des Lab	1
MA 26100	Multivariate Calculus	4	Engr BR	Engr Breadth Req	3
PHYS 27200	Elect/Magn Interactions	4	MA 26600	Ordinary Differ Equatn	3
GEE	Gen Ed Elective	3	GEE	Gen Ed Elective	3
	Semester Credits = 15			*Semester Credits* = 16	

Junior Year

Semester 5			Semester 6		
ECE 27000	Intro Digitl Sys Desgn	4	ECE 30200	Probabilistic Methods	3
ECE 30100	Signals and Systems	3	ECE 31100	Elec & Magnetic Fields	3
ECE	Adv EE Selective	3	ECE	Adv EE Selective	3
ECE	ECE Elective	1	ECE	ECE Elective (lab)	1
Cmpl Ele	Complementary Elective	2	GEE	Gen Ed Elective	3
GEE	Gen Ed Elective	3	MA 26500	Linear Algebra	3
	Semester Credits = 16			*Semester Credits* = 16	

Senior Year

Semester 7			Semester 8		
ECE 40000	Elec Engr Undergrd Sem	1	ECE	Adv EE Selective (w lab)	4
ECE 40200	EE Design Projects	3	ECE	ECE Elective (w lab)	4
ECE	ECE Elective	3	GEE	Gen Ed Elective	3
GEE	Gen Ed Elective	3	Cmpl Ele	Complementary Elective	3
Cmpl Ele	Complementary Elective	3			
	Semester Credits = 13			*Semester Credits* = 14	

Total Credits = 124