

TO: The Faculty of the College of Engineering
FROM: The School of Agricultural and Biological Engineering
RE Curriculum Changes - Agricultural Engineering Plan of Study

The faculty of the School of Agricultural & Biological Engineering has approved the following changes to the curriculum for Agricultural Engineering. The requested changes update the plan of study by reducing the credit hours required for graduation from 131 to 128. It also provides more flexibility in the course selection for students in the Environmental and Natural Resources major. Finally, it updates the courses taken during the first year to reflect changes in First Year Engineering and Department course offerings.

New Requirements or Changes in Requirements:

1. The total number of credit hours was reduced by eliminating 6 credits of free electives. One additional 3 credit engineering technical elective is now required. ENGL 10600 and COM 11400 are included in the General Education requirements. College of Agriculture Core and College of Engineering General Education requirements are referenced.
2. ECE 20100 Linear Circuit Analysis will be replaced by a course taught in the Department, ABE 31400 Design of Electronic Systems.
3. ABE 32000 Solid Modeling, Simulation and Analysis will be a required course for students majoring in Agricultural Engineering. Students majoring in Environmental and Natural Resources (ENRE) major will not be required to take ABE 32000 nor will they be required to take ABE 43500. Instead, they will choose a course from a list of approved ENRE Technical Selectives.
4. ENGR 12600 is replaced with ENGR 13100 and 13200 and the ABE 11100 requirement is dropped.

Reasons:

1. The reduction in credit hours was mandated by the Indiana legislature. The faculty decided that the best way to implement this change was to eliminate 6 credits of free electives. The General Education requirements conform to recent changes made by the colleges of Engineering and Agriculture that incorporate university core requirements.
2. The faculty decided that our students needed a broader exposure to electronics than is provided in ECE 20100. The new course was developed to provide Agricultural Engineering students with the knowledge and skills they will need in their professional careers. The course outline was reviewed by the Department's Alumni Advisory Board, which strongly endorsed the new course.
3. ABE 320 teaches skills that will be valuable to our Agricultural Engineering majors, many of whom work for companies that manufacture off-highway vehicles or components for those vehicles. Similarly, the courses from the ENRE Technical Selectives list will better prepare our ENRE majors for their careers. All of these changes were endorsed by our Alumni Advisory Board.
4. A review of EFD's revealed that the plan of study had not been updated in Engineering to reflect the replacement of ENGR 12600 with ENGR 13100 and 13200. The change had been presented to the College of Agriculture and approved. The requirement for AGR 10100 is being dropped because similar material is presented in ENGR 13100.

Agricultural Engineering: Minimum Degree Requirements; Credit Hours Required for Graduation

<i>Courses</i>	<i>Credit Hours</i>	<i>Courses</i>	<i>Credit Hours</i>
Mathematics and Basic Sciences		Mathematics and Basic Sciences	
Calculus: MA165, 166, 261, 262	16	Calculus: MA16500 (or 16100), 16600 (or 16200), 26100, 26200	16
Chemistry: CHM 115, 116 or CS 159 (MSE option)	8/7	Chemistry: CHM 11500, 11600 or CS 159 (AE option)	8/7
Physics: PHYS 172, 241	7	Physics: PHYS 17200, 24100	7
Biological Sciences		Biological Sciences	
Electives	8	Electives	8
Engineering Tools and Skills		Engineering Tools and Skills	
ENGR 126	3	ENGR 13100, ENGR 13200	4
Professional Development		Professional Development	
AGR 101, ABE 290, 490	3	ABE 29000, 49000	2
Agricultural		Agricultural	
AGRY 255 and a selective (any course taught in the College of Agriculture)	6	AGRY 255 and a selective (any course taught in the College of Agriculture)	6
Communication		General Education Courses	
English Composition: ENGL 106	4	Students must satisfy the requirements of both the College of Engineering's General Education Program and the College of Agriculture's Core. Selections must be chosen from approved lists in accordance with counsel from a faculty advisor. ENGL 10600 and COM 11400 are required, 3 credit hours must be in economics (UCC approved) and 3 must be in the humanities (UCC approved). The remaining credit hours needed to attain the minimum of 24 should be chosen carefully and should also be used to meet College of Agriculture requirements for International Understanding and Multicultural Awareness.	24
Speech: COM 114	3		
Humanities and Social Sciences General Education Must be chosen in accordance with the approved general education list and with the help of a faculty advisor. Of the 18 credit hours, 6 must meet College of Agriculture international understanding requirements, 3 must be an additional communication elective, and 3 must be economics	18		
Core Engineering Courses		Core Engineering Courses	
Mechanics: ME 270, 274, NUCL 273	9	Mechanics: ME 27000, 27400, NUCL 27300	9
Computations and Thermodynamics: ABE 205, 210	6	Computations and Thermodynamics: ABE 20500, 21000	6
Engineering Fundamentals and Sciences: ABE 305, 435, 450, ECE 201, CE 340, 343	16	Engineering Fundamentals and Sciences: ABE 30500, 31400, 45000, CE 34000, 34300; ABE 32000 and ABE 43500 (AE) or 6 cr. Technical Selectives (ENRE)	19
Design: ABE 325, 330, 485	11	Design: ABE 32500, 33000, 48400, 48600	11

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Technical Electives	6	Engineering Technical Selective	6
Other Electives	7/8	Other (Free) Electives	2/3



Bernard A. Engel
Professor and Head
Agricultural and Biological Engineering Department

Date: April 1, 2013

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

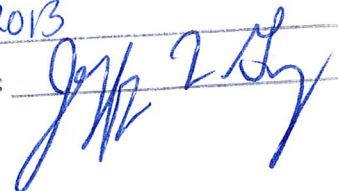
ECC Minutes

9-6-13

Date

10/3/2013

Chairman ECC



ABE Plan of Study revisions (AE major):**Present****Proposed*****Freshman Year*****First Semester**

(4) CHM 11500 General Chemistry I
 (4) ENGL 10600 English Composition I
 (4) MA 16500 Plane Analytic Geometry and Calculus I
 (3) ENGR 12600 Engineering Problem Solving and
 Computer Tools
 (1) AGR 10100 Introduction to the School of Agriculture
 and to Purdue Univ. or ENGR 10000
 Freshman Engineering Lectures

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(4) CHM 11500 General Chemistry I
 (4) ENGL 10600 English Composition I
 (2) ENGR 13100 Transforming Ideas to Innovation I
 (4) MA 16500 Plane Analytic Geometry and Calculus I
 (3) UCC Approved Humanities Selective

17**Second Semester**

(4) CHM 11600 General Chemistry II (required for
 ENRE/option for AE) or CS 15900
 Programming Appl. for Engrs (AE option)
 (3) COM 11400 Fundamentals of Speech Communications
 (4) MA 16600 Plane Analytic Geometry and Calculus II
 (4) PHYS 17200 Modern Mechanics
 (3) Humanities/Social Science Elective

18

(4/3) CHM 11600 General Chemistry II (req'd. for ENRE;
 option for AE) or CS 15900 Programming
 Appl. for Engrs. (AE option)
 (3) COM 11400 Fundamentals of Speech Communications
 (4) MA 16600 Plane Analytic Geometry and Calculus II
 (4) PHYS 17200 Modern Mechanics
 (2) ENGR 13200 Transforming Ideas to Innovations II

17/16***Sophomore Year*****Third Semester**

(3) ABE 20500 Engineering Computations for Biological
 Systems
 (3) ME 27000 Basic Mechanics I
 (4) MA 26100 Multivariate Calculus
 (3) PHYS 24100 Electricity and Optics
 (1) ABE 29000 Sophomore Seminar
 (4) Biological Sciences Elective

18

(3) ABE 20500 Computations for Engineering Systems
 (3) ME 27000 Basic Mechanics I
 (4) MA 26100 Multivariate Calculus
 (3) PHYS 24100 Electricity and Optics
 (1) ABE 29000 Sophomore Seminar
 (3) Economics Selective

17**Fourth Semester**

(3) ABE 21000 Biological Applications of Material and
 Energy Balances
 (4) MA 26200 Linear Algebra and Differential Equations
 (3) ME 27400 Basic Mechanics II
 (3) NUCL 27300 Mechanics of Materials
 (3) Social Sciences Elective

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(3) ABE 21000 Thermodynamics Principles of Engineering
 and Biological Systems
 (4) MA 26200 Linear Algebra and Differential Equations
 (3) ME 27400 Basic Mechanics II
 (3) NUCL 27300 Mechanics of Materials
 (4) BIOL 11000 Fundamentals of Biology I or BTNY 11000
 Introduction to Plant Science

17

Present		Proposed	
Junior Year			
Fifth Semester			
(3) ABE	30500	Physical Properties of Biological Materials	(3) ABE 30500 Physical Properties of Biol. Materials
(4) ABE	32500	Soil and Water Resource Engineering	(4) ABE 32500 Soil and Water Resource Engineering
(3) AGRY	25500	Soil Science	(3) AGRY 25500 Soil Science
(3) CE	34000	Hydraulics (or 4 cr. ME 30900 in place of CE 34000 and 34300)	(3) CE 34000 Hydraulics (or 4 cr. ME 30900 in place of CE 34000 and 34100)
(1) CE	34300	Hydraulics Lab (see ME 30900 opt. above)	(1) CE 34300 Hydraulics Lab (see ME 30900 opt. abv.)
(3)		Free Elective	(3) Agricultural, Humanities, or Social Sciences Selective
17		17	
Sixth Semester			
(3) ABE	33000	Design of Machine Components	(3) ABE 33000 Design of Machine Components
(3) ECE	20100	Linear Circuit Analysis	(3) ABE 31400 Design of Electronic Systems
(4)		Biological Sciences Elective	(4) BTNY 11000 Intro. to Plant Science or BIOL 11000 or College of Agriculture Biol. Sci. Selective
(3)		Economics Elective	(3) ABE 32000 Solid Modeling, Simulation, and Analysis (AE option) or ENRE Technical Selective
(3)		Free Elective	(3) Agricultural, Humanities, or Social Sciences Selective
16		16	
Senior Year			
Seventh Semester			
(3) ABE	45000	Finite Element Method in Design and Optimization	(3) ABE 45000 Finite Element Method in Design and Optimization
(1) ABE	49000	Professional Practice in Agr. & Biol. Engr.	(1) ABE 49000 Professional Practice in Agr. & Biol. Engr.
(3)		Agricultural Elective	(1) ABE 48400 Project Planning and Management
(3) ABE	43500	Hydraulic Control Systems for Mobile Equipment	(3) ABE 43500 Hydraulic Control Systems for Mobile Equipment (AE) or ENRE Technical Selective
(3)		Engineering Technical Elective	(3) Engineering Technical Selective
(3)		Written and Oral Communication Elective	(3) Written & Oral Communication Selective
16		14	
Eighth Semester			
(4) ABE	48500	Agricultural Engineering Design	(3) ABE 48600 Agricultural Engineering Design
(3)		Engineering Technical Elective	(3) Engineering Technical Elective
(3)		Social Sciences Elective	(2) Humanities or Social Science Selective
(3)		Humanities Elective	(3) Hum. or Soc. Sci. Selective (300+ level)
(1)		Free Elective (2 cr. if took CS 15900)	(2/3) Free Elective (3 cr. if took CS 15900)
14/15		13/14	
Total 135		Total 128	