

TO: The Faculty of the College of Engineering  
FROM: The Division of Environmental and Ecological Engineering  
SUBJECT: Curriculum Changes - Environmental and Ecological Engineering Plan of Study

The Faculty of the Division of Environmental and Ecological Engineering has approved the following changes to the curriculum for Environmental and Ecological Engineering. The requested changes are designed to improve student's professional preparation, increase their laboratory experience relevant to the discipline and ensure the integrity of program assessment. This action is now submitted to the Engineering Faculty with a recommendation for approval.

The proposed changes are as follows:

**A. Require EEE 29000 Introduction to Environmental and Ecological Engineering Seminar (1 cr).**

**Reason:** Students need early development and professional preparation to better craft a plan of study, learn about relevant research and internships opportunities, study abroad opportunities, and education about professional expectations.

**B. Require EEE 36000 Environmental and Ecological Engineering Laboratory(ies) (3 cr).**

**Reason:** Laboratory experience relevant to the discipline is a program criterion for accreditation. The addition of this course will ensure that students have a strong laboratory foundation upon which the capstone design experience can build.

**C. Remove ABE 32500 as an accepted substitute in the EEE curriculum for the core required course CE/EEE 35000.**

**Reason:** A significant number of EEE student outcomes are assessed in CE/EEE 35000. The EEE program does not have the capability to map and assess these outcomes in ABE 32500 leading to a potential outcomes assessment vulnerability.

**D. Modify the General Education Program to comply with the College of Engineering General Education Program.**

**Reason:** The College of Engineering General Education program was modified (EFD #43-13) to satisfy the university core curriculum. The EEE plan of study satisfies the Foundational Learning Outcomes and Programmatic Requirements.

**EEE General Education Program Requirements**

Students are strongly encouraged to develop a coherent general education plan, and distribute their general education credits throughout their academic program. The collection of courses used to fulfill this requirement must meet all of the following conditions.

1. Students must select from the list of courses approved by the University Core Council (UCC) to satisfy each of the six Foundational Learning Outcomes listed below. Some courses may have been approved to meet more than one of the Foundational Learning Outcomes, so fewer than six courses can be used to fulfill this

condition. There is no minimum number of credit hours needed to satisfy this component of the College of Engineering General Education Program. The pertinent Foundational Learning Outcomes are defined below.

Written Communication The clear expression of ideas in writing; includes grammar, organization, and structure. Varying levels and types of writing skills are required for different jobs. The ability to convey ideas concisely and coherently is important.

Oral Communication The activity of conveying meaningful information verbally; communication by word of mouth typically relies on words, visual aids and non-verbal elements to support the conveyance of the meaning. Oral communication is designed to increase knowledge, foster understanding, or to promote change in the listener's attitudes, values, beliefs, or behaviors.

Information Literacy The ability to recognize the extent and nature of information needs, then to locate, evaluate, and effectively use the needed information. It involves designing, evaluating and implementing a strategy to answer questions or achieve a desired goal.

Human Cultures: Humanities The ability to recognize one's own cultural traditions and to understand and appreciate other cultural traditions and languages. This includes content in classics, history, languages, the law, literature, the performing arts, philosophy (including ethics), religion, and visual arts.

Human Cultures: Behavior/Social Science The ability to recognize one's own cultural traditions and to understand and appreciate other cultural traditions and languages. This includes content in anthropology, psychology, cognitive science, organization theory, sociology, economics, history, counseling, and political science.

Science, Technology, and Society The ability to understand and reflect upon the complex issues raised by technological and scientific changes and its effects on society and the global world by making sense of, evaluating, and responding to present and future changes that shape individuals' work, public, and personal lives.

Students must earn a C- or better in courses used to satisfy this component of the EEE General Education Program. The list of approved Foundational Learning Outcomes courses is available at <http://www.purdue.edu/provost/initiatives/curriculum/course.html>.

2. Students must take additional approved courses to reach the minimum requirement of 24 credit hours, selected as follows:
  - o All courses approved by the University Core Council as meeting a Foundational Learning Outcome (see above list).
  - o Courses must be drawn from those offered by the departments of Agricultural Economics, Speech, Language, and Hearing Sciences, Child Development and Family Studies, Communication, Economics, English, Entrepreneurship, Foreign Languages and Literatures, History, Interdisciplinary Studies, Management, Philosophy, Political Sciences, Psychological Sciences, Sociology and Anthropology, Visual and Performing Arts. Any course offered by these departments is allowable, provided that it is open to students in the offering department and is not focused primarily on professional training, natural science or mathematics.
3. At least 6 of the 24 required credit hours must come from courses at the 30000-level or above, or from courses with a required prerequisite in the same department.

4. At least 3 credit hours in a course at the intersection of Society and the Environment. These are generally in environmental law, environmental policy, environmental history, environmental humanities, or environmental education. A list of accepted courses will be maintained by EEE <https://engineering.purdue.edu/EEE/Academics/EEEMajorCourseLists.pdf>.
5. At least 18 of the 24 required credit hours must be taken outside of the Colleges of Engineering, Science, and Technology.

In order to accommodate the addition of EEE 29000 the number of free elective credits will be reduced from 3 credits to 2 credits. In order to accommodate the addition of EEE 36000 the Advanced Chemistry requirement will be dropped. No accommodations are necessary to remove ABE 32500 as a substitute course. No changes to course requirements are necessary to meet the new General Education Requirements. The total credits required to earn the BSEEE degree remains unchanged at 128 credits.



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John W. Sutherland, Head  
Division of Environmental and Ecological Engineering

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

ECC Minutes

1/27/14

Date

1/27/14

Signature ECC

JWS 2/27

**Bachelors of Science in Environmental and Ecological Engineering (BSEEE)**

*Current*

*Proposed*

**Mathematics and Science Requirements**

MA 16500 Analytic Geometry and Calculus I (4 cr)	
MA 16600 Analytic Geometry and Calculus II (4 cr)	
MA 26100 Multivariate Calculus (4 cr)	
MA 26200 Lin. Alg. and Diff. Eq. (4 cr)	
PHYS 17200 Modern Mechanics (4 cr)	
CHM 11500 General Chemistry (4 cr)	
CHM 11600 General Chemistry (4 cr)	
Advanced Chemistry (CHM 25700 (4 cr), 3cr min)	Advanced Chemistry (CHM 25700 (4 cr), 3cr min)
Course Advanced Environmental Science (2-3 cr)	
BIOL 12100 Biology I (2 cr)	
BIOL 28600 Intro. to Ecology and Evol. (2 cr)	
Ecology (BIOL 48300 or BIOL 58500 (3 cr))	
Math & Sciences Total Credits Requirement = 40	Math & Sciences Total Credits Requirement = 37

**General Education Requirements**

ENGL 10600 or 10800 (3-4 cr)	Written Com./Information Lit. ENGL 10600 or equiv. (3cr)
COM 11400	Oral Com. COM 11400 or equiv. (3cr)
Global, Society & Contemporary Issues (9 cr)	Humanities (3cr)
6 cr min – 12 cr max in one Department	Behavior/Social Science (3cr)
6 cr 30000+ level, or prerequisite from same Dept.	Science, Technology and Society (3cr)
Credit in Foreign language requires 6 cr	General Education Electives (9cr) of which:
One course at intersection Society & Environment	3cr at intersection Society & Environment
	6 cr 30000+ level, or prerequisite from same Dept.
General Education Total Credits Requirement = 24	General Education Total Credits Requirement = 24

**Core Engineering and Electives**

Course Description/Title	
ENGR 13100 Transfrmng Ideas To Innovatn I (2 cr)	
ENGR 13200 Ideas To Innovation II (2 cr)	
CE 29700 Statics (3 cr)	
CE 29800 Dynamics (3 cr)	
ME 20000 Thermodynamics (3 cr)	
CE 340000 Hydraulics (3cr) + Lab (1cr)	
IE 23000 Prob. and Stat. in Eng. (3 cr)	
EEE 25000 Environ Ecol and Eng Sys (3 cr.)	
	Add EEE 29000 Intro. to EEE Seminar (1cr)
EEE 30000 Environ Ecol Sys Modeling (3 cr.)	
CE 35000 Intro Environ Eng (3 cr.)	
CE 35500 Engin Environ Sustainability (3 cr.)	
	Add EEE 36000 Env. and Ecol. Eng. Laboratory (3cr)
EEE 39000 EEE Prof Prac Seminar (1 cr.)	
EEE 43000 Ind. Ecol. Life Cycle Anal (3 cr.)	
EEE 48000 Senior Design (3 cr.)	
Minimum 23 cr EEE Selectives comprising 9 cr min Engineering 20000+ level including 3 cr min 40000+ level, one course Engineering Design; 5 cr Technical Electives	
3 cr free electives	2 cr free electives
Minimum Engineering Credits Required = 48	Minimum Engineering Credits Required = 52
BSEEE Degree Credit Total = 128	BSEEE Degree Credit Total = 128

Depending on course options, it is possible to complete the list of requirements with fewer than 128 credits; in this case, a student must take additional free elective course or courses to reach the minimum total of 128 credits.

Some courses have approved substitutions. The substitute courses may carry significant pre-requisites. It is likely that students entering EEE from FYE will not be able to take approved substitutions, but EEE maintains a list of approved substitutes to facilitate flexibility of students entering EEE from a different professional school after FYE.

If the Statistics course is taken outside of the College of Engineering, one of the two following must be met: either (a) EEE Selectives must include at least 12 credits (rather than the normal requirement of 9 credits) of Engineering at 20000+ level; or (b) Technical Electives must include at least 3 credits of Engineering at 20000+ level.

The EEE Selective List and EEE Selective Theme lists are maintained by EEE. Students may petition the EEE Academics Committee to allow EEE-related or environment-related courses not on the list.

Advanced Environmental Science are typically 30000+ level courses from the Colleges of Science or Agriculture (likely AGRY, BIOL, EAPS, CHM, or FNR). A list of potential courses is maintained by EEE. Students may petition the EEE Academics Committee to allow environmental science courses not currently on the approved list.

The Engineering Design requirement may also be met by courses in Technical Electives, or other courses taken that do not satisfy any requirement above. A list of acceptable engineering design courses is maintained by EEE. Students may petition the EEE Academics Committee to allow engineering design courses not currently on the approved list.

Technical Electives are defined as any course in a technical field, typically from the Colleges of Engineering, Technology, Science, or Agriculture. ENTR courses are allowed. CGT courses may be particularly appropriate for some students. Remedial courses are not allowed.

**Supporting Documentation – EEE Plan of Study Revision**

<b>Current</b>	<b>Proposed Changes shown in <i>Bold Italics</i></b>	
<b>FIRST YEAR</b>		
<i>Fall Semester</i>		
ENGR 13100	Ideas to Innovation I	2
MA 16100	Calculus I	4
CHM 11500	General Chemistry I	4
ENGL 10600	First-Year Composition	4
	Free Elective	1
		15
 <i>Spring Semester</i>		
ENGR 13200	Ideas to Innovation II	2
MA 16200	Calculus II	4
CHM 11600	General Chemistry II	4
PHYS 17200	Modern Mechanics	4
COM 11400	Fund's of Speech Comm.	3
		17
 <b>SECOND YEAR</b>		
<i>Fall Semester</i>		<i>Fall Semester</i>
		<b><i>EEE 29000</i></b> <b><i>Intro. to EEE Seminar</i></b> <b><i>1</i></b>
EEE 25000	Env. Ecol. Eng. Systems.	3
MA 26100	Multivariable Calculus	4
	Advanced Chemistry	3-4
	Technical Elective	2
	General Education Elective	3
		15-16
		<b><i>EEE 36000</i></b> <b><i>EEE Laboratory</i></b> <b><i>3</i></b>
		Technical Elective <b><i>2</i></b>
		General Education Elective <b><i>3</i></b>
		<b><i>16</i></b>
 <i>Spring Semester</i>		
CE 35500	Engr. Env. Sustainability	3
MA 26200	Linear Alg. + Diff. Eqns.	4
CE 29700	Basic Mechanics I (Statics)	3
ME 20000	Thermodynamics	3
	General Education Elective	3
		16

**Current****Proposed Changes shown in *Bold Italics*****THIRD YEAR***Fall Semester*

IE 23000	Statistics	3	
CE 35000	Intro. Environ. Engineering	3	
CE 29800	Basic Mechanics II	3	
BIOL 12100	Biol. I: Div., Ecol., Behav.	2	No Change
	EEE Selective	3	
	General Education Elective	3	
		<u>17</u>	

*Spring Semester*

CE 34000	Hydraulics	3	
CE 34300	Hydraulics Laboratory	1	
EEE 30000	Environ. Ecol. Modeling	3	
EEE 39000	EEE Professional Practice Seminar	1	No Change
EEE 43000	Industrial Ecology and LCA	3	
BIOL 28600	Intro. Ecology & Evolution	2	
	EEE Selective	3	
		<u>16</u>	

**FOURTH YEAR***Fall Semester*

EEE 48000	EEE Senior Design	1	
	EEE Selective	3	
	EEE Selective	3	
BIOL58500	Ecology	3	No Change
	General Education Elective	3	
	Technical Elective	3	
		<u>16</u>	

*Spring Semester**Spring Semester*

EEE 48000	EEE Senior Design	2	EEE 48000	EEE Senior Design	2
	EEE Selective	3		EEE Selective	3
	EEE Selective	3		EEE Selective	3
	General Education Elective	3		General Education Elective	3
	General Education Elective	3		General Education Elective	3
	Free Elective	1-2		<b><i>Free Elective</i></b>	<b><i>1</i></b>
		<u>15-16</u>			<u>15</u>

Total Credits Required for Graduation Remains Unchanged = 128.