

Cover Sheet: Request 12577

Add ABE3212C to Biosystems Engineering Track

Info

Process	Specialization New/Modify/Close Ugrad
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	James Leary drleary@ufl.edu
Created	4/21/2018 8:55:33 PM
Updated	9/27/2018 12:39:05 PM
Description of request	The ABE Curriculum Committee is requesting that ABE3212C, Land and Water Resources Engineering, becomes a required course for the Biosystems Engineering track.

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	ENG - Agricultural and Biological Engineering 514907000	Dorota Haman		4/22/2018
ABE3212C added to Biosystems Track 4.21.2018.docx					4/21/2018
ABE3212C Memo to Add to Biosystems Option 4.21.2018.docx					4/22/2018
College	Approved	ENG - College of Engineering	Heidi Dublin	Approved by HWCOE Curriculum Committee 4/24	4/30/2018
No document changes					
Associate Provost for Undergraduate Affairs	Approved	PV - APUG Review	Angela Lindner		9/27/2018
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			9/27/2018
No document changes					
Office of the Registrar					
No document changes					
Student Academic Support System					
No document changes					
Catalog					
No document changes					
College Notified					
No document changes					

Specialization|Modify for request 12577

Info

Request: Add ABE3212C to Biosystems Engineering Track

Description of request: The ABE Curriculum Committee is requesting that ABE3212C, Land and Water Resources Engineering, becomes a required course for the Biosystems Engineering track.

Submitter: James Leary drleary@ufl.edu

Created: 4/21/2018 8:23:50 PM

Form version: 1

Responses

Specialization Name

Enter the name of the specialization.

Response:
Biosystems Engineering

Specialization Code

Enter the two or three letter code for the specialization.

Response:
BIE

Effective Term

Enter the term (semester and year) at which the modification should be effective.

Response:
Earliest Available

Effective Year

Response:
Earliest Available

Is this an Undergraduate Innovation Academy Program

Response:
No

Current Curriculum for Specialization

Response:
Biological Engineering
Biological engineering (BE) applies engineering principles to the biological sciences to produce biofuels, food and fiber products and other agricultural products from renewable bio-resources. In addition, it evaluates packaging systems and designs, and introduces new technologies and methods to enhance agricultural production of crops and livestock. It also aims to protect the environment and conserve and replenish our natural resources.

About this Major

- College: Herbert Wertheim College of Engineering
- Degree: Bachelor of Science in Biological Engineering
- Credits for Degree: 128
- Specializations:
 - o Agricultural Production Engineering; Biosystems Engineering; Land and Water Resources Engineering; Packaging Engineering
- Academic Learning Compact
- Additional Information

• Related Biological Engineering Programs

To graduate with this major, students must complete all university, college, and major requirements.

Overview

Biological engineers pioneer new designs and techniques in such areas as agricultural robotics, remote sensing, bioprocessing, biofuels, precision agriculture, plant space biology, sustainability of our natural resources, and packaging product design and development.

Graduates are educated in the biological and environmental sciences as well as in engineering. They will address critical problems involving land and water resources, biological systems, production agriculture and innovations in packaging. Students can choose a focus area based on their courses of specialization and individual selection of electives. Areas of specialization are biosystems engineering, land and water resources engineering, packaging engineering, and agricultural production engineering.

In addition to abundant job opportunities in Florida's agricultural industry, graduates have career opportunities in biotechnology and in fields related to Florida's water quality and water resources, including water management districts, environmental companies, consulting firms, equipment manufacturers, bio-energy, food engineering and the packaging industry.

The BE curriculum can also fulfill requirements for admission to professional programs as well as to graduate programs including biomedical engineering, civil engineering and mechanical engineering.

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Educational Objectives

Graduates from the University of Florida's undergraduate degree program in biological engineering will be prepared for at least one of the following:

- Successful careers in the profession of biological engineering or other related fields.
- Gaining admission to a graduate and/or professional degree program.

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Goals

To develop biological engineering professionals with technical proficiency and societal responsibility.

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Mission

The department will develop professionals, create and disseminate knowledge, and promote the application of engineering and management principles to meet societal needs with respect to agriculture, packaging, land and water resources, and biological systems.

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Biosystems Engineering

Critical Tracking Model Semester Plan

- Required courses: 6 credits
 - o ABE 4033 Fundamentals and Applications of Biosensors (3) or ABE 4812 Food and Bioprocess Engineering Unit Operations (4)
 - o ABE 4662 Quantification of Biological Processes (3)
- Department electives: 3 credits minimum
- Engineering electives: 10 credits minimum
- Technical electives: 6 credits

Critical Tracking

Critical Tracking records each student's progress in courses that are required for entry to each major. Please note the critical-tracking requirements below on a per-semester basis.

Equivalent critical-tracking courses as determined by the State of Florida Common Course Prerequisites may be used for transfer students.

Semester 1

- Complete 1 of 8 tracking courses with a minimum grade of C within two attempts: CHM 2045 or CHM 2095, CHM 2046 or CHM 2096, MAC 2311, MAC 2312, MAC 2313, MAP 2302, PHY 2048, PHY 2049

- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 2

- Complete 1 additional tracking course with a minimum grade of C within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 3

- Complete 2 additional tracking courses with minimum grades of C within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 4

- Complete 2 additional tracking courses with minimum grades of C within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 5

- Complete all 8 critical-tracking courses with minimum grades of C in each course within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

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Model Semester Plan

To remain on track, students must complete the appropriate critical-tracking courses, which appear in bold. These courses must be completed by the terms as listed above in the Critical Tracking criteria.

This semester plan represents an example progression through the major. Actual courses and course order may be different depending on the student's academic record and scheduling availability of courses. Prerequisites still apply.

Semester 1 Credits

CHM 2045 General Chemistry 1 or

CHM 2095 Chemistry for Engineers 1

GE-B/P 3

CHM 2045L General Chemistry 1 Laboratory

GE-P 1

MAC 2311 Analytic Geometry and Calculus 1

State Core GE-M

4

Humanities

State Core GE-H, N or D

3

Social and Behavioral Sciences

State Core GE-S, D or N

3

Total 14

Semester 2 Credits

ABE 2062 Biology for Engineers or

BSC 2010 Intermediate Biology 1

GE-B/P 3

CHM 2046 General Chemistry and Qualitative Analysis or

CHM 2096 Chemistry for Engineers 2

State Core GE-B/P

3

CHM 2046L General Chemistry 2 Laboratory

GE-B/P 1

IUF 1000 What is the Good Life

GE-H 3

MAC 2312 Analytic Geometry and Calculus 2

GE-M 4

Total 14

Semester 3 Credits

ABE 2012C Introduction to Biological Engineering 3
 MAC 2313 Analytic Geometry and Calculus 3
 GE-M 4
 PHY 2048 with Calculus 1
 GE-B/P 3
 PHY 2048L Physics with Calculus 1 Laboratory
 GE-B/P 1
 ENC 1101 Expository and Argumentative Writing or
 ENC 1102 Argument and Persuasion
 State Core GE-C
 3
 Total 14
 Semester 4 Credits
 EGM 2511 Engineering Mechanics: Statics 3
 EML 3007 Elements of Thermodynamics and Heat Transfer 3
 MAP 2302 Elementary Differential Equations
 GE-M 3
 PHY 2049 Physics with Calculus 2
 GE-B/P 3
 PHY 2049L Laboratory for Physics with Calculus 2
 GE-B/P 1
 Social and Behavioral Sciences
 GE-S, D or N 3
 Total 16
 Semester 5 Credits
 CGN 2328 Technical Drawing and Visualization or
 EML 2023 Computer Aided Graphics and Design 3
 CGN 3710 Experimentation and Instrumentation in Civil Engineering or
 EEL 3003 Elements of Electrical Engineering 3
 CHM 2200 Fundamentals of Organic Chemistry or
 BCH 3023 Elementary Organic and Biological Chemistry 3
 EGM 3520 Mechanics of Materials 3
 Total 12
 Semester 6 Credits
 ABE 3612C Heat and Mass Transfer in Biological Systems 4
 CGN 3421 Computer Methods in Civil Engineering, 4 credits, or
 ENV 3040C Computer Methods in Environmental Engineering, 3 credits, or
 ESI 4327C Matrix/Numerical Methods in Systems Engineering, 4 credits 3-4
 EGM 3400 Elements of Dynamics 2
 ENC 3246 Professional Communication for Engineers (GE-C) 3
 Technical elective
 Department-approved 3
 Total 15-16
 Semester 7 Credits
 ABE 3000C Applications in Biological Engineering 3
 ABE 3652C Physical and Rheological Properties of Biological Materials, 3 credits, or
 CGN 3501C Civil Engineering Materials, 4 credits 3-4
 ABE 4033 Fundamentals and Applications of Biosensors or
 ABE 4413C Post Harvest Operations Engineering 3
 ABE 4931 Professional Issues in Biological Engineering 1
 EGN 3353C Fluid Mechanics, 3 credits, or
 CWR 3201 Hydrodynamics, 4 credits 3-4
 Total 13-15
 Semester 8 Credits
 ABE 4042C Biological Engineering Design 1 2
 ABE 4171 Power and Machines for Biological Systems 3
 ABE 4662 Quantification of Biological Processes 3
 Engineering electives
 Department-approved 6
 Total 14
 Semester 9 Credits
 ABE 4033 Fundamentals and Applications of Biosensors, 3 credits, (If not taken previously) or

ABE 4812 Food Engineering Unit Operations, 4 credits		3-4
ABE 4043C Biological Engineering Design 2	2	
Department elective		
Department-approved	3	
Engineering elective		
Department-approved	5	
Technical elective		
Department-approved	3	
Total	16-17	

Proposed Changes

Describe the proposed changes to the specialization.

Response:

Add ABE3212C (4 cr), Land and Water Resources Engineering to the Biosystems track during the 9th Semester (Spring). Replace four of five engineering elective credits, and reduce the total engineering elective credits from 11 to seven.

Pedagogical Rationale/Justification

Describe the rationale for the proposed changes to the specialization.

Response:

This change to the Biosystems Engineering track is the result of graduating students desire to have had a water-related class to enhance their undergraduate education.

Impact on Other Programs

Describe any potential impact on other programs or departments, including increased need for general education or common prerequisite courses, or increased need for required or elective courses outside of the existing program.

Response:

There will be no impact on other programs or departments. The instructor has indicated that he can accommodate the resulting increase of students to his class.

Assessment Data Review

Describe the Student Learning Outcomes and/or program goal data that was reviewed to support the proposed changes.

Response:

The data that supports this proposed change is the record of the ABE Department Chair from several semesters of interviews conducted with graduating seniors.

Academic Learning Compact and Academic Assessment Plan

Describe the modifications to the Academic Learning Compact (for undergraduate programs) and Academic Assessment Plan that result from the proposed change.

Response:

There will be no modifications to the Academic Learning Compact. The Academic Assessment Plan will not change.

Biological Engineering

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- [Academic Learning Compact](#)
- [Additional Information](#)

- [Related Biological Engineering Programs](#)

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Agricultural Production Engineering

[Critical Tracking Model Semester Plan](#)

- Required courses: 10 credits
- ABE 4033 Fundamentals and Applications of Biosensors (3)
- ABE 4413C Post Harvest Operations Engineering (3)
- CEG 4011 Soil Mechanics (4)
- Department electives: 3 credits minimum
- Engineering electives: 6 credits minimum
- Technical electives: 6 credits

Critical Tracking

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Equivalent critical-tracking courses as determined by the State of Florida [Common Course](#)

[Prerequisites](#) may be used for transfer students.

Semester 1

- Complete 1 of 8 tracking courses with a minimum grade of C within two attempts: CHM 2045 or CHM 2095, CHM 2046 or CHM 2096, MAC 2311, MAC 2312, MAC 2313, MAP 2302, PHY 2048, PHY 2049
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 2

- Complete 1 additional tracking course with a minimum grade of C within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 3

- Complete 2 additional tracking courses with minimum grades of C within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 4

- Complete 2 additional tracking courses with minimum grades of C within two attempts
- 2.5 GPA required for all critical-tracking courses
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Semester 5

- Complete all 8 critical-tracking courses with minimum grades of C in each course within two attempts
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This semester plan represents an example progression through the major. Actual courses and course order may be different depending on the student's academic record and scheduling availability of courses. Prerequisites still apply.

Semester 1	Credits
CHM 2045 General Chemistry 1 or CHM 2095 Chemistry for Engineers 1 <i>GE-B/P</i>	3
CHM 2045L General Chemistry 1 Laboratory <i>GE-B/P</i>	1
MAC 2311 Analytic Geometry and Calculus 1 <i>State Core GE-M</i>	4
Humanities <i>State Core GE-H; N or D</i>	3
Social and Behavioral Sciences <i>State Core GE-S</i>	3
Total	14
Semester 2	Credits

ABE 2062 Biology for Engineers <i>or</i> BSC 2010 Intermediate Biology 1 <i>GE-B/P</i>	3
CHM 2046 General Chemistry and Qualitative Analysis <i>or</i> CHM 2096 Chemistry for Engineers 2 <i>GE-B/P</i>	3
CHM 2046L General Chemistry 2 Laboratory <i>GE-B/P</i>	1
IUF 1000 What is the Good Life <i>GE-H</i>	3
MAC 2312 Analytic Geometry and Calculus 2 <i>State Core GE-M</i>	4
Total	14
Semester 3	Credits
ABE 2012C Introduction to Biological Engineering	3
MAC 2313 Analytic Geometry and Calculus 3 <i>GE-M</i>	4
PHY 2048 with Calculus 1 <i>State Core GE-B/P</i>	3
PHY 2048L Physics with Calculus 1 Laboratory <i>GE-B/P</i>	1
ENC 1101 Expository and Argumentative Writing <i>or</i> ENC 1102 Argument and Persuasion <i>State Core GE-C; E6</i>	3
Total	14
Semester 4	Credits
EGM 2511 Engineering Mechanics: Statics	3
EML 3007 Elements of Thermodynamics and Heat Transfer	3
MAP 2302 Elementary Differential Equations <i>GE-M</i>	3
PHY 2049 Physics with Calculus 2 <i>GE-B/P</i>	3

PHY 2049L Laboratory for Physics with Calculus 2 <i>GE-B/P</i>	1
Social and Behavioral Sciences <i>GE-S, D or N; E6</i>	3
Total	16
Semester 5	Credits
CGN 2328 Technical Drawing and Visualization <i>or</i> EML 2023 Computer Aided Graphics and Design	3
CGN 3710 Experimentation and Instrumentation in Civil Engineering <i>or</i> EEL 3003 Elements of Electrical Engineering	3
CHM 2200 Fundamentals of Organic Chemistry <i>or</i> BCH 3023 Elementary Organic and Biological Chemistry	3
EGM 3520 Mechanics of Materials	3
Total	12
Semester 6	Credits
ABE 3612C Heat and Mass Transfer in Biological Systems	4
CGN 3421 Computer Methods in Civil Engineering, <i>4 credits, or</i> ENV 3040C Computer Methods in Environmental Engineering, <i>3 credits, or</i> ESI 4327C Matrix/Numerical Methods in Systems Engineering, <i>4 credits</i>	3-4
EGM 3400 Elements of Dynamics	2
ENC 3246 Professional Communication for Engineers <i>State Core GE-C; E6</i>	3
Technical elective <i>Department-approved</i>	3
Total	15-16
Semester 7	Credits
ABE 3000C Applications in Biological Engineering	3
ABE 3212C Land and Water Resources Engineering	4
ABE 3652C Physical and Rheological Properties of Biological Materials, <i>3 credits, or</i> CGN 3501C Civil Engineering Materials, <i>4 credits</i>	3-4

ABE 4931 Professional Issues in Biological Engineering	1
EGN 3353C Fluid Mechanics, 3 credits, or CWR 3201 Hydrodynamics, 4 credits	3-4
Total	14-16
Semester 8	Credits
ABE 4042C Biological Engineering Design 1	2
ABE 4171 Power and Machines for Biological Systems	3
CEG 4011 Soil Mechanics	4
Department elective <i>Department-approved</i>	3
Technical elective <i>Department-approved</i>	3
Total	15
Semester 9	Credits
ABE 4033 Fundamentals and Applications of Biosensors	3
ABE 4043C Biological Engineering Design 2	2
ABE 4413C Post-Harvest Operations Engineering	3
Engineering electives <i>Department-approved</i>	6
Total	14

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Biosystems Engineering

[Critical Tracking Model Semester Plan](#)

- Required courses: 6 credits
- ABE 4033 Fundamentals and Applications of Biosensors (3) or
ABE 4812 Food and Bioprocess Engineering Unit Operations (4)
- ABE 4662 Quantification of Biological Processes (3)
- Department electives: 3 credits minimum
- Engineering electives: 10 credits minimum
- Technical electives: 6 credits

Critical Tracking

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Semester 2

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- 2.5 GPA required for all critical-tracking courses
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Semester 3

- Complete 2 additional tracking courses with minimum grades of C within two attempts
- 2.5 GPA required for all critical-tracking courses
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Semester 4

- Complete 2 additional tracking courses with minimum grades of C within two attempts
- 2.5 GPA required for all critical-tracking courses
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Semester 5

- Complete all 8 critical-tracking courses with minimum grades of C in each course within two attempts
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CHM 2045 General Chemistry 1 or CHM 2095 Chemistry for Engineers 1 <i>GE-B/P</i>	3
CHM 2045L General Chemistry 1 Laboratory <i>GE-P</i>	1
MAC 2311 Analytic Geometry and Calculus 1 <i>State Core GE-M</i>	4
Humanities <i>State Core GE-H, N or D</i>	3
Social and Behavioral Sciences <i>State Core GE-S, D or N</i>	3
Total	14
Semester 2	
ABE 2062 Biology for Engineers or BSC 2010 Intermediate Biology 1 <i>GE-B/P</i>	3
CHM 2046 General Chemistry and Qualitative Analysis or CHM 2096 Chemistry for Engineers 2 <i>State Core GE-B/P</i>	3
CHM 2046L General Chemistry 2 Laboratory <i>GE-B/P</i>	1
IUF 1000 What is the Good Life <i>GE-H</i>	3
MAC 2312 Analytic Geometry and Calculus 2 <i>GE-M</i>	4
Total	14
Semester 3	
ABE 2012C Introduction to Biological Engineering	3
MAC 2313 Analytic Geometry and Calculus 3 <i>GE-M</i>	4
PHY 2048 with Calculus 1 <i>GE-B/P</i>	3

PHY 2048L Physics with Calculus 1 Laboratory <i>GE-B/P</i>	1
ENC 1101 Expository and Argumentative Writing or ENC 1102 Argument and Persuasion <i>State Core GE-C</i>	3
Total	14
Semester 4	Credits
EGM 2511 Engineering Mechanics: Statics	3
EML 3007 Elements of Thermodynamics and Heat Transfer	3
MAP 2302 Elementary Differential Equations <i>GE-M</i>	3
PHY 2049 Physics with Calculus 2 <i>GE-B/P</i>	3
PHY 2049L Laboratory for Physics with Calculus 2 <i>GE-B/P</i>	1
Social and Behavioral Sciences <i>GE-S, D or N</i>	3
Total	16
Semester 5	Credits
CGN 2328 Technical Drawing and Visualization or EML 2023 Computer Aided Graphics and Design	3
CGN 3710 Experimentation and Instrumentation in Civil Engineering or EEL 3003 Elements of Electrical Engineering	3
CHM 2200 Fundamentals of Organic Chemistry or BCH 3023 Elementary Organic and Biological Chemistry	3
EGM 3520 Mechanics of Materials	3
Total	12
Semester 6	Credits
ABE 3612C Heat and Mass Transfer in Biological Systems	4

CGN 3421 Computer Methods in Civil Engineering, 4 credits, <i>or</i> ENV 3040C Computer Methods in Environmental Engineering, 3 credits, <i>or</i> ESI 4327C Matrix/Numerical Methods in Systems Engineering, 4 credits	3-4
EGM 3400 Elements of Dynamics	2
ENC 3246 Professional Communication for Engineers (<i>GE-C</i>)	3
Technical elective <i>Department-approved</i>	3
Total	15-16
Semester 7	Credits
ABE 3000C Applications in Biological Engineering	3
ABE 3652C Physical and Rheological Properties of Biological Materials, 3 credits, <i>or</i> CGN 3501C Civil Engineering Materials, 4 credits	3-4
ABE 4033 Fundamentals and Applications of Biosensors <i>or</i> ABE 4413C Post Harvest Operations Engineering	3
ABE 4931 Professional Issues in Biological Engineering	1
EGN 3353C Fluid Mechanics, 3 credits, <i>or</i> CWR 3201 Hydrodynamics, 4 credits	3-4
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Semester 8	Credits
ABE 4042C Biological Engineering Design 1	2
ABE 4171 Power and Machines for Biological Systems	3
ABE 4662 Quantification of Biological Processes	3
Engineering electives <i>Department-approved</i>	6
Total	14
Semester 9	Credits
ABE 4033 Fundamentals and Applications of Biosensors, 3 credits, (<i>If not taken previously</i>) <i>or</i> ABE 4812 Food Engineering Unit Operations, 4 credits	3-4
ABE 4043C Biological Engineering Design 2	2

Department elective <i>Department-approved</i>	3
ABE 3212C Land and Water Resources Engineering	<u>4</u>
Engineering elective <i>Department-approved</i>	<u>51</u>
Technical elective <i>Department-approved</i>	3
Total	16-17

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352-392-1864 x 115
352-392-4092 Fax
Website: www.abe.ufl.edu
e-mail: drleary@ufl.edu**Memo****Date:** April 21, 2018**To:** Herbert Wertheim College of Engineering Curriculum Committee**From:** James D. Leary, ABE Department **Re:** New Course Requirement for Biosystems Option in BE

The ABE Curriculum Committee met on January 18, 2018 and approved the addition of ABE3212C, *Land and Water Resources Engineering*, to the Biosystems Engineering specialization of the Biological Engineering major. At the current time, this course is required for the Agricultural Production Engineering, and Land and Water Resources Engineering tracks. The rationale for this additional course included information from Dorota Haman, ABE Chair. In her interviews with graduating seniors in the Biosystems track, several students had indicated they wish they had taken a water-related course such as ABE3212C while completing their coursework. Dr. Rafa Muños-Carpena, the teacher for the class, said that he is willing to include more general-related water topics for a greater appeal, while Dr. Eric McLamore said he could provide material related to the need for water to sustain life. The Biosystems option has 18 elective credits that includes 11 engineering elective credits. Adding ABE3212C (4 cr) reduces to seven credits the engineering elective credits required. Since this is a spring-only course, it will replace four of five engineering elective credits.