Engineering Faculty Document 60-17
November 30th, 2016

TO: The Faculty of the College of Engineering

FROM: The School of Agricultural and Biological Engineering

RE Curriculum Changes - Biological Engineering Plan of Study

The faculty of the School of Agricultural & Biological Engineering have approved the following changes to the curriculum for Biological Engineering. The requested change to the plan of study decreases the credit hours required for English Composition from 4 credits to 3 credits.

Summary of Changes:

1. The English Composition requirement have been reduced from 4 credits to 3 credits.

Reasons:

1. The College of Agriculture has updated the English Composition Core Requirement so that it may be fulfilled with 3 credits, rather than 4. Adjusting the Biological Engineering Plan of Study to incorporate the change provides additional flexibility to students and better aligns with First Year Engineering's Plan of Study and the College of Engineering's general education requirement.

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

Present	**Total Credit Hours**	**129**	**Proposed**	**Total Credit Hours**	**129**
Courses		***Credit Hours***	***Courses***		***Credit Hours***
Mathematics and Basic Sciences			**Mathematics and Basic Sciences**		
Calculus: MA16500, 16600, 26100, 26200, 30300		**19**	Calculus: MA16500, 16600, 26100, 26200, 30300		**19**
*****Chemistry: CHM 11500, 11600, 25700 (or 25500 and 25501)		**12 - 13**	*****Chemistry: CHM 11500, 11600, 25700 (or 25500 and 25501)		**12 - 13**
Physics: PHYS 17200		**4**	Physics: PHYS 17200		**4**
Computer Science: CS 15900		**3**	Computer Science: CS 15900		**3**
Biological and Food Sciences			**Biological and Food Sciences**		
Biological Sciences or Biotechnology: BIOL 11000 and 221 or IT 22600 with Biological Sciences selective and BIOL 23000 or BIOL 23100		**8**	Biological Sciences or Biotechnology: BIOL 11000 and 221 or IT 22600 with Biological Sciences selective and BIOL 23000 or BIOL 23100		**8**
*****BCHM 30700 or NUTR 20500 or CNIT 22700 or IT 22700; (option to add BCHM 30900, 1 cr. lab)		**3**	*****BCHM 30700 or NUTR 20500 or CNIT 22700 or IT 22700; (option to add BCHM 30900, 1 cr. lab)		**3**
*****Biological Sciences & Science Selectives		**3**	*****Biological Sciences & Science Selectives		**3**
Engineering Tools and Skills			**Engineering Tools and Skills**		
ENGR 13100, ENGR 13200, CHE 32000		**7**	ENGR 13100, ENGR 13200, CHE 32000		**7**
Professional Development			**Professional Development**		
ABE 29000, 49000		**2**	ABE 29000, 49000		**2**
General Education:			**General Education:**		
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**	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 an advisor. COM 11400 and ***3 credits of English Composition 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**
Core Engineering Courses			**Core Engineering Courses**		
Thermodynamics and Bioprocessing: ABE 20100, 20200, 30100, 30300		**13**	Thermodynamics and Bioprocessing: ABE 20100, 20200, 30100, 30300		**13**
Bioprocessing; Momentum, Heat and Mass Transfer: ABE 30400,30700, 30800		**9**	Bioprocessing; Momentum, Heat and Mass Transfer: ABE 30400,30700, 30800		**9**

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Kinetics and Reaction Engineering: ABE 37000	**3**	Kinetics and Reaction Engineering: ABE 37000	**3**
Sensors and Process Control: ABE 46000	**3**	Sensors and Process Control: ABE 46000	**3**
Transport Processes and Operations: ABE 45700, 55700	**6**	Transport Processes and Operations: ABE 45700, 55700	**6**
Biol. and Food Process Design: ABE 55800	**3**	Biol. and Food Process Design: ABE 55800	**3**
Process Engineering: ABE 58000	**3**	Process Engineering: ABE 58000	**3**
Technical Elective or Design of Electric Systems (ABE 31400)	**3**	Technical Elective or Design of Electric Systems (ABE 31400)	**3**

***The total number of credit hours in these categories sum to 21.**

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

Date: November 30th, 2016

Biological Engineering Plan of Study Revisions

Present				Proposed			
Freshman Year							
First Semester							
(4)	CHM	11500	General Chemistry I	(4)	CHM	11500	General Chemistry I
(4)	ENGL	10600	English Composition I	***(3)***			***English Composition Selective***
(2)	ENGR	13100	Transforming Ideas to Innovation I	(2)	ENGR	13100	Transforming Ideas to Innovation I
(4)	MA	16500	Plane Analytic Geometry and Calculus I	(4)	MA	16500	Plane Analytic Geometry and Calculus I
(4)	PHYS	17200	Modern Mechanics	(4)	PHYS	17200	Modern Mechanics
18				**17**			
Second Semester							
(4)	CHM	11600	General Chemistry II				
(3)	COM	11400	Fundamentals of Speech Communications				No Change
(4)	MA	16600	Plane Analytic Geometry and Calculus II				
(2)	ENGR	13200	Transforming Ideas to Innovation II				
(3)	CS	15900	Programming Applications for Engineers				
16				**16**			
Sophomore Year							
Third Semester							
(4)	ABE	20100	Thermodynamics of Biological Systems I				
(4)	MA	26100	Multivariate Calculus				
(4)	CHM	25700	Organic Chemistry or Organic Chemistry I 25500 and Organic Chemistry Lab I 25501				
(4/5)	BIOL	11000	Fundamentals of Biology I or IT 22600 (Biotech. Lab – 2 cr) with 3 cr. BIOL 23000 (Biology of the Living Cell) or BIOL 23100 (Cell Structure & Function)				No Change
(1)	ABE	29000	Sophomore Seminar				
17/18				**17/18**			

Fourth Semester

(3)	ABE	20200	Thermodynamics of Biological Systems II	
(3)	CHE	32000	Statistical Modeling	
(3/4 / 5)	NUTR	20500	Food Sci. I; or Biochemistry (BCHM 30700) option to add 1 cr. Lab (BCHM 30900); or take Econ. Selective along with Bioinformatics (CNIT 22700) or Biotech. Lab (IT 22700)	No Change
(4)	MA	26200	Linear Algebra and Differential Equations	
(3)			Approved Humanities Selective	
16/17/18				**16/17/18**

Present				**Proposed**
Junior Year				
Fifth Semester				
(3)	ABE	37000	Biol./Microb. Kinetics & React. Engr.	
(3)	ABE	30300	App of Phys. Chemistry to Biol. Processes	
(3)	ABE	30700	Momentum Transfer	No Change
(4)	BIOL	22100	Introduction to Microbiology or 3 cr Biology Selective	
(3)	MA	30300	Differential Equations and Partial Differential Equations for Engineering and the Sciences	
16				**16**

Sixth Semester

(3)	ABE	30100	Modeling. & Cmptnl. Tools in Bio. Engr.	
(3)	ABE	45700	Transport Processes in Biol. & Food Process Systems	No Change
(3)	ABE	30800	Heat & Mass Tran. in Food & Biol. Sys.	
(3)	ABE	30400	Bioprocess Engineering Laboratory	
(3)	ABE	31400	Design of Electronic Systems	
(3)			Economics Selective	
18				**18**

Senior Year			
Seventh Semester			
(3)	ABE 55700	Transport Operations in Food & Biol. Engr. II	
(1)	ABE 49000	Professional Practice in Agr.& Biol. Engr.	No Change
(3)	ABE 46000	Sensors and Process Control	
(3/4)		Humanities or Social Sciences or Engineering Selective	
(3)		Written & Oral Communication Selective	
13/14			**13/14**
Eighth Semester			
(3)	ABE 58000	Process Engr. of Renewable Resources	
(3)	ABE 55800	Process Design for Food & Biol. Systems	
(3)		Biol., Food Sci., or 3 cr. Pharm. Selective or Cell & Molecular Des. Prin. (ABE 440)	No Change
(3)		Humanities or Social Sciences or Engineering Selective	
(3)		Humanities or Social Science Selective (300+ level)	
15			**15**
Total 129			**Total 129**