

**Department of Agricultural and Biosystems Engineering - North Dakota State University**  
**BIOSYSTEMS ENGINEERING CONCENTRATION**  
**FALL 2009**

STUDENT \_\_\_\_\_

STUDENT ID # \_\_\_\_\_

ADVISOR \_\_\_\_\_

		FALL				SPRING			
		Course	Crs	Grade	Gen Ed	Course	Crs	Grade	Gen Ed
Freshman (<27 crs)	ABEN 110	Intro to ABEN	2			ABEN 496	Ag Technology Expo	1	
	ABEN 189*	Skills/Academic Success	1		F	ME 221	Engineering Mechanics I	3	
	CHEM 121	General Chemistry I	3		S	CHEM 122	General Chemistry II	3	S
	CHEM 121L	General Chemistry I Lab	1			CHEM 122L	General Chemistry II Lab	1	
	ENGL 110**	College Composition I	3		C	ENGL 120	College Composition II	3	C
	MATH 165	Calculus I	4		R	MATH 166	Calculus II	4	
	BIOL 150	General Biology	3		S	Computer Elective (see back)		3	
		<b>Total</b>	<b>17</b>			<b>Total</b>	<b>18</b>		
Sophomore (27-59 crs)	ABEN 255	Comp. Aided Analysis/Design	3			ABEN 263	Biomaterials Processing	3	
	CHEM 240	Survey of Organic Chem	3			CE 309	Fluid Mechanics	3	
	COMM 110	Fund Public Speaking	3			PHYS 252	Univ Physics II	4	
	MATH 128	Intro to Linear Algebra	1			PHYS 252L	Univ Physics Lab II	1	L
	MATH 259	Multivariate Calculus	3			MATH 266	Intro Diff Equations	3	
	ME 222	Engineering Mechnaics II	3			CHEM/BIO Elective (see side bar and back)		3	
		<b>Total</b>	<b>16</b>			<b>Total</b>	<b>17</b>		
Junior (60 - 89 crs)	ABEN 444	Transport Processes	3			ABEN 482	Instr. & Measurements	3	
	IME 440	Engineering Economy	2			ME 350	Thermodynamics	3	
	IME 460	Statistics (or STAT 330)	3			ABEN Elective (see side bar and back)		3	
	ENGR Elective (see side bar and back)		3			ENGR Elective (see side bar and back)		3	
	ENGL 321, 324, or 459	Intensive Writing	3			Gen Ed Elective (see side bar)		3	A or B
	CHEM/BIO Elective (see side bar and back)		3			Gen Ed Elective (see side bar)		2	W
		<b>Total</b>	<b>17</b>			<b>Total</b>	<b>17</b>		
Senior (90 + crs)	ABEN 486	Design Project I	2			ABEN 487	Design Project II	2	
	ABEN 491	Seminar	1			ABEN Elective (see side bar and back)		3	
	ENGR 402	Engr Ethics & Social Resp	1			Gen Ed Elective (see side bar)		3	A or B
	ABEN Elective (see side bar and back)		3			Gen Ed Elective (see side bar)		3	A or B
	Gen Ed Elective (see side bar and back)		3		A or B	Tech Elective (see side bar and back)		4	
	ENGR Elective (see side bar and back)		3						
	Tech Elective (see side bar and back)		3						
		<b>Total</b>	<b>16</b>			<b>Total</b>	<b>15</b>		

General Education Electives			
Approved courses listed in registration schedule			
Gen Ed	Course	Crs	Grade
A		3	
A		3	
B		3	
B		3	
D ■	(double-count with A or B above)	3	
G ●	(double-count with A or B above)	3	
W		2	

**General Education Categories:**

- A - Humanities/Fine Arts
- B - Social/Behavioral Sciences
- C - Communication
- D - Cultural Diversity ■
- F - First-Year Experience
- G - Global Perspectives ●
- L - Co-requisite Lab
- R - Quantitative Reasoning
- S - Science & Technology
- W - Wellness

Program Electives		
Select courses in consultation with your advisor.		
Course	Crs	Grade
<b>ABEN Electives - 9 credits required</b>		
<b>ENGR Electives - 9 credits required</b>		
<b>CHEM/BIO Science Electives - 6 credits required</b>		
<b>Tech Electives - 7 credits required</b>		

<b>Total Credits</b>
<b>133</b>

**Transfer Students:**

- "T" indicates requirement satisfied with a transfer course.
- "IP" indicates a course currently in progress.

\* ABEN 189 is required for students that transfer in fewer than 24 earned transfer credits

\*\* First year students with a composite ACT score ≥ 21 should register for ENGL 120 (unless transfer credit for ENGL 120 is received). If ENGL 120 is completed with a grade of "C" or better, three credits will be awarded for ENGL 110 with a passing grade (P). For more details on NDSU's English Placement process, go to [www.ndsu.edu/cfwriters](http://www.ndsu.edu/cfwriters)

## BIOSYSTEMS ENGINEERING Curriculum Guide Continued

SEMESTER	ABEN REQUIRED	ABEN ELECTIVES	ABEN GRADUATE
<b>2009-2010</b>			
<b>FALL</b>	110-2	358-3	652-3
	189-1	452-3	679-3
	255-3	473-3	
	486-1	479-3	
	491-1		
<b>SPRING</b>	263-3	456-3	656-3
	377-3	478-3	678-3
	482-3		682-3
	487-2		
<b>2010-2011</b>			
<b>FALL</b>	110-2	458-3	658-3
	189-1	473-3	673-3
	255-3	479-3	679-3
	486-2		790-1
	491-1		791-3
<b>SPRING</b>	263-3	444-3	644-3
	377-3	464-4	664-4
	482-3		682-3
	487-2		758-3

**The following electives are approved;  
alternatives may be possible with advisor approval.**

### Engineering Electives

(choose at least 9 credits from this list)

CE 310 - Fluid Mechanics Lab  
 CE 370-371 - Environmental Engineering/Lab  
 ECE 301 - Electrical Engineering I  
 ME 223 - Mechanics of Materials  
 ME 331 - Engineering Materials I

### Computer Elective (choose 1 course)

CE 212 - Civil Eng. Graphic Comm  
 CSCI 122 - Visual BASIC  
 ME 212 - Visual Comm for Eng  
 ME 213 - Eng Sys Modeling (MATLAB)

### Suggested Tech Electives

(in addition to courses from ABEN, CHEM/BIO, or ENGR electives)

BIOC 473 - Methods of Biochemical Research  
 BIOC 474 - Methods of Recombinant DNA Technology  
 BIOL 310L - Methods in Cell and Molecular Biology  
 CFS 210 - Intro to Food Science  
 CFS 370 - Food Processing I  
 CFS 450 - Cereal Technology  
 MICR 454 - Bioprocessing

### Suggested ABEN Electives

ABEN 358 - Electrical Energy Applications in Ag  
 ABEN 377 - Numerical Modeling in Ag/Bio Systems  
 ABEN 452 - Bioenvironmental Systems Design  
 ABEN 458 - Food Process Engineering  
 ABEN 499 - Biofuels

### Suggested CHEM/BIO Electives

ANSC 357 - Animal Genetics	BIOL 315/L - Genetics/Lab
ANSC 463 - Physiology of Reproduction	BIOL 364 - General Ecology
CHEM 260 - Elements of Biochemistry	BOT 314 - Systematic Botany
CHEM 341L - Organic Chemistry Lab	BOT 380 - Plant Physiology
CHEM 342, 2L - Organic Chemistry II Lab(s)	BOT 460 - Plant Ecology
BIOC 460 - Biochemistry I (includes lab)	MICR 350/L - General Microbiology/Lab
BIOC 461 - Biochemistry II	MICR 352/L - General Microbiology II/Lab
BIOL 150L - General Biology I Lab	MICR 452 - Microbial Ecology
BIOL 220 - Human Anatomy & Physiology I	ZOO 370 - Cell Biology