Department of Agricultural and Biosystems Engineering - North Dakota State University

BIOSYSTEMS ENGINEERING CONCENTRATION - FALL 2020* (See Page 2)

STUDENT _____ STUDENT ID # _____ ADVISOR_____

	FALL					SPRING				
	Course	Crs	Grade[1]	300/400 Level[2]	Gen Ed	Course	Crs	Grade	300/400 Level	Gen Ed
Freshman (<27 crs)	ABEN 110 *Intro to ABEN*	3				ABEN 496 *Field Exp./Ag Technology Expo*	1		1	
	CHEM 121 *General Chemistry I*	3			S	ME 221 *Engineering Mechanics I*	3			
	CHEM 121L *General Chemistry I Lab*	1				CHEM 122 *General Chemistry II*	3			S
	ENGL 110[3] *College Composition I*	4[4]			C	CHEM 122L *General Chemistry II Lab*	1			
	MATH 165 *Calculus I*	4			R	ENGL 120 *College Composition II*	3			C
	BIOL 150 *General Biology*	3			S	MATH 166 *Calculus II*	4			
						Computer Elective (see back)	3			
		18					18			
Sophomore (27-59 crs)	ABEN 255 *Comp. Aided Analysis/Design*	3				ABEN 263 *Biomaterials Processing*	3			
	CHEM 240 *Survey of Organic Chem*	3				PHYS 252 *Univ Physics II*	4			
	COMM 110 *Fund Public Speaking*	3			C	PHYS 252L *Univ Physics Lab II*	1			L
	MATH 128 *Intro to Linear Algebra*	1				MATH 266 *Intro Diff Equations*	3			
	MATH 259 *Multivariate Calculus*	3				Gen Ed Elective (see side bar)	3			A/B
	ME 222 *Engineering Mechanics II*	3				CHEM/BIO Elective (see side bar and back)	3			
		16					17			
Junior (60 - 89 crs)	CE 309 *Fluid Mechanics*	3		3		ABEN 444 *Transport Processes*	3		3	
	IME 440 *Engineering Economy*	2		2		ABEN 482 *Inst. & Measurement*	3		3	
	IME 460 *Eval. Engr. Data (or STAT 330)*	3		3		ME 350 *Thermodynamics*	3		3	
	ENGR Elective (see side bar and back)	3				ABEN 391 *Seminar*	1			
	ENGL 320, 321, 324, or 459 *Intensive Writing*	3		3	C	Gen Ed Elective (see side bar)	3			A/B
	CHEM/BIO Elective (see side bar and back)	3				Gen Ed Elective (see side bar)	2			W
		17				*Complete your Degree Audit this semester	15			
Senior (90 + crs)	ABEN 486 *Design Project I*	2		2		ABEN 487 *Design Project II*	2		2	
	ENGR 402 *Engr Ethics & Social Resp*	1		1		ABEN Elective (see side bar and back)	6			
	ABEN Elective (see side bar and back)	3				ENGR Elective (see side bar and back)	3			
	Gen Ed Elective (see side bar and back)	3			A/B	Gen Ed Elective (see side bar)	3			A/B
	ENGR Elective (see side bar and back)	3				Tech Elective (see side bar and back)	3			
	Tech Elective (see side bar and back)	3								
		15				*Complete your Application for Graduation by 3rd week of semester	17			

The last 30 credits must be earned in residence at NDSU.

Minimum Degree Total

133

General Education Electives

See www.ndsu.edu/registrar/gened for approved courses

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 ■
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
ABEN Electives - 9 cr req		
ENGR Electives - 9 cr req		
CHEM/BIO/ENVIRO Science Electives[7] - 6 cr req		
Tech Electives - 6 cr req[5]		
Adv Biosciences (ABC) - 9 cr req[6]		
CHEM 240 *Survey of Organic Chem*	3	
ABEN 444 *Transport Processes*	3	

[1] Use this column to tally grades; use "T" for transfer courses and "IP" for courses currently in progress.

[2] Use this column to tally 36 credits of 300/400 level courses required for graduation

[3] First year students with a composite ACT ENGL sub-score ≥ 18 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 https://bulletin.ndsu.edu/academic-policies/undergraduate-policies/english-and-math-placement/#englishplacementtext

[4] Completion of Composition I is required for graduation, whether you earn 4 credits at NDSU or 3 credits with a transfer course. . If you transfer in a 3 cr. ENGL 110, you will need to add an add'l 1 credit to maintain the 133 total credits required.

[5] Technical Electives can be additional courses from ABEN, Engineering, or Chem/Bio/Enviro Electives. ABEN 496 - Ag Tech Expo (1 add'l cr.) may be used as a Technical Elective. ABEN 496 - Field Exp./Internship/TA, 1 cr., may be used as an ABEN Elective or as a Technical Elective. A maximum of two credits of ABEN 496 FE/Internship may be counted towards degree requirements.

[6] Advanced bioscience courses (ABC) may double-count with Program Electives; qualifying courses must have a biological science component with one or more prerequisites (see reverse for ABC eligible courses). Add'l courses may be available in consultation with your advisor. At least 3 cr. must be from non-ABEN courses.

[7] ABEN courses may not be used to fulfill CHEM/BIO/ENVIRO Science Electives

Updated: 07/22/2020
BSEN-CurriculumGuide2020.xlsx

BIOSYSTEMS ENGINEERING CURRICULUM GUIDE CONTINUED

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

Suggested Computer Electives		ABC[1]
CE 212	Civil Engineering Graphic Communication	
CSCI 122	Visual BASIC	
CSCI 160	Computer Science I	
ECE 173	Introduction to Computing	
GEOG 455	Intro. to Geographic Information Systems	
IME 380	CAD/CAM for Manufacturing	
ME 212	Visual Communication For Engineering	
ME 213	Modeling of Engineering Systems	

ABEN Electives		ABC
ABEN 358	Electrical Energy Application in Ag	
ABEN 377	Numerical Modeling in Ag/Bio Systems	
ABEN 452	Bioenvironmental Systems Design	Y
ABEN 456	Biobased Energy	Y
ABEN 458	Process Engineering for Food & Biofuels/products	Y
ABEN 464	Resource Conservation & Irrigation Engineering	Y
ABEN 473	Agricultural Power	
ABEN 478	Machinery Analysis & Design	
ABEN 479	Fluid Power Systems Design	
ABEN 484	Drainage & Wetland Engineering	Y

Engineering Electives (choose at least 9 credits from this list or ABEN electives)		ABC
CE 310	Fluid Mechanics Lab	
CE 370/371	Environmental Engineering/Lab	Y
ECE 301	Electrical Engineering I	
ME 223	Mechanics of Materials	
ME 331	Materials Science and Engineering	

[1]ABC is an abbreviation for Advanced Bioscience Courses. Please see footnote 6 on page 1 for further explanation.

Suggested CHEM/BIO/ENVIRO Electives		Prerequisites	ABC
ANSC 357	Animal Genetics	PLSC 315, STAT 330	Y
ANSC 463	Physiology of Reproduction		
BIOC 260	Elements of Biochemistry	CHEM 117/122, CHEM 140/240	Y
BIOC 461	Foundation of Biochem & Molecular Bio II	Recomm. CHEM 460	
BIOC 473	Methods of Biochemical Research	BIOC 461	Y
BIOC 474	Methods of Recombinant DNA Tech	BIOC 460. Co-Req: BIOC 461	Y
BIOL 150L	General Biology I Lab		
BIOL 151/L	General Biology II / Lab		
BIOL 220	Human Anatomy & Physiology I		
BIOL 315/L	Genetics/Lab		
BIOL 364	General Ecology	BIOL 150, 151, & 315	Y
BOT 380	Plant Physiology	BIOL 150	Y
BOT 460	Plant Ecology	BIOL 151, 151L	Y
CFS 210	Introduction to Food Science		
CFS 370	Food Processing I	Recomm. CFS 210	
CFS 450	Cereal Technology		
CHEM 341/L	Organic Chemistry/Lab	CHEM 122 or 151 /122L or 161	Y
CHEM 342/L	Organic Chemistry II/Lab	CHEM 240 or 341 /341L	Y
MICR 202/L	Introductory Microbiology		
MICR 350/L	General Microbiology I/Lab	BIOL 150, CHEM 122	Y
MICR 352/L	General Microbiology II/Lab	MICR 350 /350L	Y
MICR 452	Microbial Ecology	MICR 350, 350L	Y
ZOO 370	Cell Biology	BIOL 150, 150L	Y

Tech Electives can be additional courses from ABEN, Engineering, Chem/Bio/Enviro, or Computer Electives. ABEN 496 - Ag Tech Expo (1 add'l cr.) may be used as a Technical Elective. ABEN 496 - Field Exp./Internship, 1 cr., may be used as an ABEN Elective or as a Technical Elective. A maximum of two credits of ABEN 496 FE/Internship may be counted towards degree requirements.

Projected ABEN Course Offerings

Semester	Required		Electives		Graduate	
Fall	110-3	486-1	358-3	458-3	658-3	765-3
ODD	255-3		473-3	479-3	673-3	790-1
Years					679-3	
Spring	263-3	482-3	377-3		644-3	682-3
EVEN	444-3	487-2	456-3		656-3	758-3
Years		491-1	478-3		678-1	

Semester	Required		Electives		Graduate	
Fall	110-3	486-2	358-3	479-3	652-3	684-3
EVEN	255-3		452-3	484-3	673-3	747-3
Years			473-3		679-3	790-1
Spring	263-3	482-3	377-3	464-4	644-3	682-3
ODD	444-3	487-2		478-3	664-4	750-3
Years		491-1			678-3	758-3

*As a student at NDSU, it is your responsibility to know the requirements of your degree. To ensure all degree requirements are met, meet with your academic advisor regularly and follow your Academic Req. Report found on Campus Connection. Required ABEN Courses are typically offered only once per year. ABEN electives are typically offered only once every two years, and all courses are subject to change.