

Agricultural and Biosystems Engineering 2014

Major: Agricultural & Biosystems Engineering Option: Agricultural Engineering

Degree Type: B.S.A.B.En

Required Degree Credits to Graduate: 133

General Education Requirements

First Year Experience (F):

ABEN 189	Skills for Academic Success (Students transferring in 24 or more credits do not need to take ABEN 189.)	1
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Communication (C):

ENGL 110	College Composition I	3
ENGL 120	College Composition II	3
One Course in Upper Level Writing. Select one of the following:		3
ENGL 321	Writing in the Technical Professions	
ENGL 324	Writing in the Sciences	
ENGL 459	Researching and Writing Grants and Proposal	
COMM 110	Fundamentals of Public Speaking	3

Quantitative Reasoning (R):

MATH 165	Calculus I	4
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Science & Technology (S):

CHEM 121	General Chemistry I	3
CHEM 122	General Chemistry II	3
PHYS 252 & 252L	University Physics II and University Physics II Laboratory	5

Humanities & Fine Arts (A): Select from current general education list	6
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Social & Behavioral Sciences (B): Select from current general education list	6
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Wellness (W): Select from current general education list	2
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Cultural Diversity (D): Select from current general education list	
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Global Perspectives (G): Select from current general education list	
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Total Credits	42
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Major Requirements - Agricultural Option

General Education Requirements	40
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ABEN Core Courses:

ABEN 110	Introduction to Agricultural and Biosystems Engineering	2
ABEN 255	Computer Aided Analysis & Design	3
ABEN 263	Biological Materials Processing	3
ABEN 377	Numerical Modeling in Agricultural and Biosystems Engineering	3
ABEN 482	Instrumentation & Measurements	3
ABEN 486	Design Project I	2
ABEN 487	Design Project II	2
ABEN 491	Seminar	1
ABEN 496	Field Experience	1

ABEN 300-400 Electives: Select 9 credits from the following:		9
ABEN 358	Electric Energy Application in Agriculture	
ABEN 383	Structural Design for Biosystems	
ABEN 444	Transport Processes	
ABEN 450	Bioprocess Engineering	
ABEN 452	Bioenvironmental Systems Design	
ABEN 456	Biobased Energy	
ABEN 458	Process Engineering for Food, Biofuels and Bioproducts	
ABEN 464	Resource Conservation and Irrigation Engineering	
ABEN 473	Agricultural Power	
ABEN 478	Machinery Analysis & Design	
ABEN 479	Fluid Power Systems Design	
ABEN 484	Drainage and Wetland Engineering	
MATH Courses:		
MATH 128	Introduction to Linear Algebra	1
MATH 166	Calculus II	4
MATH 259	Multivariate Calculus	3
MATH 266	Introduction to Differential Equations	3
ME Courses:		
ME 212	Fundamentals of Visual Communication for Engineers	3
ME 221	Engineering Mechanics I	3
ME 222	Engineering Mechanics II	3
ME 223	Mechanics of Materials	3
ME 350	Thermodynamics and Heat Transfer	3
Additional Courses:		
CE 309	Fluid Mechanics	3
CE 310	Fluid Mechanics Laboratory	1
ECE 301	Electrical Engineering I	3
ENGR 402	Engineering Ethics and Social Responsibility	1
IME 440	Engineering Economy	2
IME 460	Evaluation of Engineering Data	3
or STAT 330	Introductory Statistics	
Program Electives	The following program electives may be selected from courses listed in the Program Electives Tab located at: http://bulletin.ndsu.edu/undergraduate/colleges/engineering/agricultural-biosystems-engineering/agricultural-biosystems-engineering/#programelectivestext	
Computer Electives	Select a minimum of 3 credits from the following department website: www.ndsu.edu/aben/academics	3
Business or Communication Elective	Choose one course from the following prefix options: BUSN, COMM, ACCT, AGECE, ECON, MGT, MIS, MRKT *	3
Chemistry/Biological Science Electives	Select a minimum of 9 credits from the following department website: www.ndsu.edu/aben/academics	9
Technical Electives	Select a minimum of 8 credits from the Ag Option Area Tab or following department website: www.ndsu.edu/aben/academics	8
Total Credits		133

* The course used for this business or communication elective cannot double-count as General Education.

SUGGESTED EMPHASIS AREA for the Agricultural Engineering Option: Consult with adviser when making selections. Emphasis electives found at: <http://bulletin.ndsu.edu/undergraduate/colleges/engineering/agricultural-biosystems-engineering/agricultural-biosystems-engineering/#emphasisareastext>

- **Agricultural Systems** - Select electives with emphasis on machine, power, structural, and electrical/electronic systems to solve problems involving engineering aspects of food, feed, and fiber production.
- **Environmental Systems** - Select electives with emphasis on areas that contribute to solving problems in environmental engineering, natural resources management, hydrology, irrigation, watershed management, and waste management.
- **Biomaterial Systems** - Select electives with emphasis on combining engineering, biological, and physical sciences in the application of engineering principles to handling and processing of biomaterials for food and non-food products.

Degree Requirements and Notes

A student must complete at least 60 semester credits of professional level course work in his/her program while in residence and enrolled in the college. Students transferring into the college from programs with professional accreditation are exempt from this residency requirement but are subject to the residency requirement of NDSU.