Ag & Biosystems Engineering Dept. 05/05/11
Iowa State University

AGRICULTURAL ENGINEERING CURRICULUM
AGRICULTURAL AND ENVIRONMENTAL SYSTEMS ENGINEERING OPTION
(2011-2012 Catalog)

A total of 127.5 credits required for graduation

I. Communications (9.5 credits)

	3 cr.	Engl 150 (FSSS)	Critical Thinking and Communication
	3 cr.	Engl 250 (FSSS)	Written, Oral, Visual, and Electronic Composition
	3 cr.	Engl 309 (FS)	Report and Proposal Writing
or	3 cr.	Engl 314 (FSSS)	Technical Communication
or	3 cr.	Sp Cm 212 (FSSS)	Fundamentals of Public Speaking
or	3 cr.	Ag Eds 311 (FS)	Presentation and Sales Strategies for Ag Audiences
	0.5 cr.	Lib 160 (FSSS)	Library Instruction

II. Mathematical Sciences (14 credits)

4 cr.	Math 165 (FSSS)	Calculus I
4 cr.	Math 166 (FSSS)	Calculus II
3 cr.	Math 266 (FSSS)	Elementary Differential Equations
3 cr.	Stat 305 (FSSS)	Engineering Statistics

III. Physical Sciences (15 credits)

4 cr.	Chem 167 (FS)	General Chemistry for Engineering Students
1 cr.	Chem 167L (FS)	Laboratory in General Chemistry for Engineering
5 cr.	Phys 221 (FSSS)	Introduction to Classical Physics I
5 cr.	Phys 222 (FSSS)	Introduction to Classical Physics II

IV. Agricultural and Biological Sciences (6 credits)

3 cr.	Select from departmental-approved list.	
3 cr.	Biol 211 (FS)	Principles of Biology 1

V. Social Sciences and Humanities (12 credits)

3 cr.	U. S. Diversity Course (Select from University-approved list).
3 cr.	International Perspectives Course (Select from University-approved list).
6 cr.	Social Science and Humanities Electives (Select from CALS-approved list).

VI. Engineering (3 credits)

R cr.	Engr 101 (FS)	Engineering Orientation
3 cr.	Engr 160 (FSSS)	Engineering Problems with Computer Applications Lab
3 cr.	AE 170 (FS)	Engineering Graphics and Introductory Design

VII. Agricultural Engineering (31 credits)

	1 cr.	A E 110 (S)	Experiencing Agricultural and Biosystems Engineering
	1 cr.	A E 201 (FS)	Entrepreneurship and Internship Seminar
	3 cr.	A E 216 (F)	Fundamentals of Agricultural and Biological Engineering
	2 cr.	AE 218 (S)	Project Management & Design in Ag & Biological Systems Engr
	1 cr.	A E 271 (FS)	Engineering Applications of Parametric Solid Modeling
or	1 cr.	A E 272 (FS)	Parametric Solid Models, Drawings, and Assemblies Using Pro/ENG
	3 cr.	AE 316 (F)	Computer Applications and Systems Modeling

	4 cr.	A E 363 (F)	Agri-Industrial Applications of Electric Power and Electronics
	3 cr.	A E 340 (F)	Functional Analysis and Design of Agricultural Field Machinery
or	3 cr.	A E 478 (Alt. S11)	Design of Agricultural Structures
or	3 cr.	BSE 480 (S)	Engineering Analysis of Biological Systems
	3 cr.	A E 404 (F)	Instrumentation for Agricultural and Biological Engineering
	*2 cr.	A E 415 (FS)	Agricultural Engineering Design I
	*2 cr.	A E 416 (FS)	Agricultural Engineering Design II
	3 cr.	A E 431 (F)	Design and Evaluation of Soil and Water Conservation Systems
	3 cr.	A E 472 (Alt. S10)	Design of Environmental Systems for Agricultural Structures

VIII. Mechanical Engineering (3 credits)

3 cr.	M E 231 (FS)	Thermodynamics

IX. Engineering Mechanics (10 credits)

3 cr.	E M 274 (FSSS)	Statics of Engineering
3 cr.	E M 324 (FSSS)	Mechanics of Materials
1 cr.	E M 327 (FSSS)	Mechanics of Materials Laboratory
3 cr.	E M 378 (FSSS)	Mechanics of Fluids

X. Civil Engineering (7 credits)

3 cr.	C E 332 (FS)	Structural Analysis I
4 cr.	C E 372 (FS)	Engineering Hydrology and Hydraulics

XI. Technical Electives** (to be selected with adviser guidance) (14 credits)

Emphasis in Water & Environmental Systems

Highly recommended

	3 cr.	CE 326 (FS)	Principles of Environmental Engineering
	3 cr.	AE 436 (Alt S)	Design & Evaluation of Soil and Water Monitoring Systems
and/or	3 cr.	AE 532 (Alt S)	Non-Point Pollution and Control
	2 cr.	Micro 201 (FS)	Introduction to Microbiology
	1 cr.	Micro 201L (FS)	Introduction to Microbiology Laboratory

Additional courses

3 cr.	A E 533 (Alt. F10)	Erosion and Sediment Transport
	A E Courses	Other AE courses not required in this option may be selected
3 cr.	Agron 505 (Alt S)	Environmental Biophysics
3 cr.	C E 360 (FS)	Soil Engineering
3 cr.	Con E 380 (FS)	Engineering Law
*3 cr.	Engr 466 (FS)	Multidisciplinary Engineering Design (may be repeated and can replace AE 415 and AE 416)

Emphasis in Structural Design

3 cr.	C E 333 (FS)	Structural Steel Design I
3 cr.	C E 334 (FSSS)	Reinforced Concrete Design I
3 cr.	C E 360 (FS)	Soil Engineering
3 cr.	A E 478/578 (Alt. S11)	Design of Agricultural Structures[1]
3 cr.	A E 469/569 (S)	Grain Processing and Handling

[1] See Section VII. Need to take AE 340 (F) or BSE 480 (S)

Emphasis in Thermal Sciences

3 cr.	ME 332 (FS)	Engineering Thermodynamics II
4 cr.	M E 436 (FS)	Heat Transfer
3 cr.	ME 433 (F)	Alternative Energy Conversion
3 cr.	ME 441 (F)	Fundamentals of Heating, Ventilating, and Air Conditioning
3 cr.	ME 442 (S)	Heating and Air Conditioning Design

Emphasis in Air/Water Quality

3 cr.	C E 326 (FS)	Principles of Environmental Engineering
2 cr.	TSM 424(F)	Impacts of Agriculture on Water Quality
3 cr.	A E 436/536 (Alt. S11)	Design and Evaluation of Soil and Water Monitoring Systems
3 cr.	A E 533 (Alt. F10)	Erosion and Sediment Transport
3 cr.	AGRON 505 (Alt. S11)	Environmental Biophysics (Biometeorology)

** This list is not complete; other electives may be selected with the approval of the Curriculum Committee. Any 300-/400- level Engr/AE/BSE/TSM course will be accepted provided the material covered is not included in required courses of this option.