

**AGRICULTURAL ENGINEERING CURRICULUM  
LAND AND WATER RESOURCES ENGINEERING OPTION\***  
(2015-2016 Catalog)

A total of 128 credits required for graduation

**I. Communications (10 credits)**

- 3 cr. Engl 150 (FSSS) Critical Thinking and Communication
- 3 cr. Engl 250 (FSSS) Written, Oral, Visual, and Electronic Composition
- 3 cr. Communications Select one of the courses below:
  - Engl 309 (FS) Report and Proposal Writing*
  - Engl 314 (FSSS) Technical Communication*
  - Sp Cm 212 (FSSS) Fundamentals of Public Speaking*
  - Ag Eds 311 (FS) Presentation and Sales Strategies for Ag Audiences*
  - MKT 343 Personal Sales*
- 1 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 (18 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
- 3 cr. Geol 201 (F) Geology for Engineers and Environmental Scientists.

**IV. Agricultural and Biological Sciences (9 credits)**

- 3 cr. Agron 154 (FS) Fundamentals of Soil Science
- 3 cr. Biology Select one of the courses below:
  - Biol 251 (S) Biological Processes in the Environment*
  - Biol 211 (FS) Principles of Biology I*
- 2 cr. Micro 201 (FS) Introduction to Microbiology
- 1 cr. Micro 201L (FS) Introduction to Microbiology Laboratory

**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. A B E 160 (FSSS) Engineering Problems with Computer Applications Lab

**VII. Agricultural Engineering (40 credits)**

- 1 cr. A B E 110 (S) Experiencing Agricultural and Biological Engineering
- 3 cr. A B E 170 (FS) Engineering Graphics and Introductory Design
- 1 cr. A B E 201 (FS) Entrepreneurship and Internship Seminar
- 3 cr. A B E 216 (F) Fundamentals of Agricultural and Biological Engineering

2 cr.	A B E 218 (S)	Project Management & Design in Ag & Biological Systems Engr
1 cr.	Computer Graphics	Select one of the courses below:
	A B E 271 (FS)	<i>Engineering Applications of Parametric Solid Modeling</i>
	A B E 272 (FS)	<i>Parametric Solid Models, Drawings, and Assemblies Using Pro/ENG</i>
	A B E 273 (S)	<i>CAD for Process Facilities and Land Use Planning (Preferred)</i>
3 cr.	A B E 316 (F)	Computer Applications and Systems Modeling
4 cr.	A B E 363 (F)	Agri-Industrial Applications of Electric Power and Electronics
3 cr.	A B E 404 (F)	Instrumentation for Agricultural and Biological Engineering
3 cr.	A B E 408 (F)	GIS and Natural Resource Management
		<b>See adviser for options</b>
3 cr.	A B E 431 (F)	Design and Evaluation of Soil and Water Conservation Systems
3 cr.	Water Quality	Select one of the courses below:
	A B E 436 (Sp-even)	<i>Design &amp; Evaluation of Soil and Water Monitoring Systems</i>
	A B E 432 (Sp-odd)	<i>Non-Point Pollution and Control</i>
	A B E 537 (Fl-odd)	<i>Total Maximum Daily Load (TMDL) Development and Implementation</i>
3 cr.	Structures	Select one of the courses below:
	A B E 472 (Sp-even)	<i>Design of Environmental Systems for Agricultural Structures</i>
	A B E 478 (Sp-odd)	<i>Design of Agricultural Structures</i>
3 cr.	ABE Breadth	Select one of the courses below:
	A B E 340 (F)	<i>Functional Analysis and Design of Agricultural Field Machinery</i>
	A B E 380 (S)	<i>Engineering Analysis of Biological Systems</i>
	A B E 469 (S)	<i>Grain Processing and Handling</i>
	A B E 424 (S)	<i>Air Pollution (Modules A, B, and E)</i>
2 cr.	A B E 415 (FS)	Agricultural Engineering Design I
2 cr.	A B E 416 (FS)	Agricultural Engineering Design II

#### VIII. Mechanical Engineering (3 credits)

3 cr.	M E 231 (FS)	Thermodynamics
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#### 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 (9 credits)

3 cr.	C E 372 (FS)	Engineering Hydrology and Hydraulics
3 cr.	C E 326 (FS)	Principles of Environmental Engineering
3 cr.	Subsurface Systems	Select one of the courses below
	C E 360 (FS)	<i>Geotechnical Engineering</i>
	C E 473 (F)	<i>Groundwater Hydrology</i>

\*Increasingly, employers in land and water resources engineering consider the Master's degree to be the entry "working degree". **Students are therefore strongly encouraged to consider a concurrent BS/MS.**

Also, there are many excellent and career-relevant courses at Iowa State that are not required in this curriculum, but would be good choices for a student who has the room and inclination to take them. These include (but are not limited to):

- A B E 388 (F) 3 cr. Sustainable Engineering and International Development
- C E 111 (FS) 3 cr. Fundamentals of Surveying I
- EnSci 404 (S) 3 cr. Global Change
- EnSci 407 (S) 4 cr. Watershed Management
- EnSci 411 (F) 4 cr. Hydrogeology (could be substituted for CE subsurface systems course also)
- EnSci 418 (Alt F13) 3 cr. Stream Ecology
- EnSci 463 (S) 4 cr. Soil Formation and Landscape Relationships

**\*Please check the current catalog and Schedule of Classes for most recent offerings**