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)
   - 1 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
   A B E 271 (FS) Engineering Applications of Parametric Solid Modeling
   A B E 272 (FS) Parametric Solid Models, Drawings, and Assemblies Using Pro/ENG
   A B E 273 (S) CAD for Process Facilities and Land Use Planning (Preferred)
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

See adviser for options

3 cr. A B E 431 (F) Design and Evaluation of Soil and Water Conservation Systems

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 (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) Geotechnical Engineering
   C E 473 (F) Groundwater Hydrology

*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 311 (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