AGRONOMY, B.S.

CREATING A HEALTHIER, MORE PRODUCTIVE, MORE RESILIENT AGRICULTURE FOR WISCONSIN AND THE WORLD.

That is the challenge taken up by the faculty, staff and students of the Department of Agronomy.

We generate and apply knowledge about the plants that feed and benefit humankind. Agronomic crops are typically grown for grain to feed people and livestock, or are processed into products. Feed crops are grown specifically to meet the nutritional needs of livestock. Forage crops are grown for their stems, leaves, and other edible plant parts.

We find and implement solutions to problems and opportunities concerning efficiency and sustainability of crop production and in safe and environmentally sound ways.

We generate knowledge on the genetics, genomics, biochemistry, and physiology of plants.

We study the interactions among cropping systems, climate, and the environment. We emphasize sustainable agriculture, whether precision, traditional or organic, in order to reduce the impact on the environment and the inhabitants of our planet.

We work to ensure that agricultural systems and products in Wisconsin and the world are able to meet rapidly-changing needs and those of future generations.

Undergraduates in the Department of Agronomy earn a bachelor of science degree to prepare them for everything from pursuit of a graduate degree to careers in science, education, agriculture, agribusiness, and environment and conservation.

HOW TO GET IN

To declare this major, students must be admitted to UW–Madison and the College of Agricultural and Life Sciences (CALS). For information about becoming a CALS first-year or transfer student, see Entering the College (http://guide.wisc.edu/undergraduate/agricultural-life-sciences/enteringthecollegetext).

Students who attend Student Orientation, Advising, and Registration (SOAR) with the College of Agricultural and Life Sciences have the option to declare this major at SOAR. Students may otherwise declare after they have begun their undergraduate studies. For more information, contact the advisor listed under the Advising and Careers tab.

REQUIREMENTS

UNIVERSITY GENERAL EDUCATION REQUIREMENTS

All undergraduate students at the University of Wisconsin–Madison are required to fulfill a minimum set of common university general education requirements to ensure that every graduate acquires the essential core of an undergraduate education. This core establishes a foundation for living a productive life, being a citizen of the world, appreciating aesthetic values, and engaging in lifelong learning in a continually changing world. Various schools and colleges will have requirements in addition to the requirements listed below. Consult your advisor for assistance, as needed. For additional information, see the university Undergraduate General Education Requirements (http://guide.wisc.edu/undergraduate/#requirementsforundergraduatetystudtext) section of the Guide.

<table>
<thead>
<tr>
<th>General Education</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Breadth—Humanities/Literature/Arts: 6 credits</td>
</tr>
<tr>
<td>• Breadth—Natural Science: 4 to 6 credits, consisting of one 4- or 5-credit course with a laboratory component; or two courses providing a total of 6 credits</td>
</tr>
<tr>
<td>• Breadth—Social Studies: 3 credits</td>
</tr>
<tr>
<td>• Communication Part A &amp; Part B *</td>
</tr>
<tr>
<td>• Ethnic Studies *</td>
</tr>
<tr>
<td>• Quantitative Reasoning Part A &amp; Part B *</td>
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</table>

* The mortarboard symbol appears before the title of any course that fulfills one of the Communication Part A or Part B, Ethnic Studies, or Quantitative Reasoning Part A or Part B requirements.

COLLEGE OF AGRICULTURAL AND LIFE SCIENCES REQUIREMENTS

In addition to the University General Education Requirements, all undergraduate students in CALS must satisfy a set of college and major requirements. Specific requirements for all majors in the college and other information on academic matters can be obtained from the Office of Academic Affairs (http://www.cals.wisc.edu/academics), College of Agricultural and Life Sciences, 116 Agricultural Hall, 1450 Linden Drive, Madison, WI 53706; 608-262-3003. Academic departments and advisors also have information on requirements. Courses may not double count within university requirements (General Education and Breadth) or within college requirements (First-Year Seminar, International Studies and Science), but courses counted toward university requirements may also be used to satisfy a college and/or a major requirement; similarly, courses counted toward college requirements may also be used to satisfy a university and/or a major requirement.

COLLEGE REQUIREMENTS FOR ALL CALS B.S. DEGREE PROGRAMS

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>CHEM 103</td>
<td>General Chemistry I</td>
</tr>
<tr>
<td>or CHEM 108</td>
<td>Chemistry in Our World</td>
</tr>
<tr>
<td>or CHEM 109</td>
<td>Advanced General Chemistry</td>
</tr>
<tr>
<td>Biological Science</td>
<td>5</td>
</tr>
<tr>
<td>Additional Science (Biological, Physical, or Natural)</td>
<td>3</td>
</tr>
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</table>
Science Breadth (Biological, Physical, Natural, or Social)  3
CALS Capstone Learning Experience: included in
the requirements for each CALS major (see "Major
Requirements") (http://guide.wisc.edu/undergraduate/
agricultural-life-sciences/#requirementstext)

## MAJOR REQUIREMENTS

<table>
<thead>
<tr>
<th>Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>Mathematics and Statistics</td>
<td>Select one of the following (or may be satisfied by placement exam):</td>
<td>5-6</td>
</tr>
<tr>
<td>MATH 112 &amp; MATH 113</td>
<td>Algebra and Trigonometry</td>
<td></td>
</tr>
<tr>
<td>MATH 114</td>
<td>Algebra and Trigonometry</td>
<td></td>
</tr>
<tr>
<td>MATH 171</td>
<td>Calculus with Algebra and Trigonometry I</td>
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<tr>
<td>MATH 211</td>
<td>Calculus</td>
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<tr>
<td>MATH 221</td>
<td>Calculus and Analytic Geometry I</td>
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<tr>
<td>Select one of the following:</td>
<td>STAT 301 Introduction to Statistical Methods</td>
<td>3</td>
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<tr>
<td>STAT 371</td>
<td>Introductory Applied Statistics for the Life Sciences</td>
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<tr>
<td>STAT/B M I 541</td>
<td>Introduction to Biostatistics</td>
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<tr>
<td>STAT/F&amp;W ECOL/HORT 571</td>
<td>Statistical Methods for Bioscience I</td>
<td></td>
</tr>
<tr>
<td>Chemistry</td>
<td>Select one of the following:</td>
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<tr>
<td>CHEM 103 &amp; CHEM 104</td>
<td>General Chemistry I and General Chemistry II</td>
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<tr>
<td>CHEM 109</td>
<td>Advanced General Chemistry</td>
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<tr>
<td>Biology</td>
<td>Select one of the following options:</td>
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<tr>
<td>Option 1:</td>
<td>BOTANY/BOTANY 130 General Botany</td>
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<tr>
<td></td>
<td>ZOOLOGY/BOTANY 101 Animal Biology</td>
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<td></td>
<td>ZOOLOGY/BOTANY 102 Animal Biology Laboratory</td>
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<tr>
<td>Option 2:</td>
<td>BIOLOGY/BOTANY/ZOOLOGY 151 Introductory Biology and Introductory Biology</td>
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<tr>
<td>Option 3:</td>
<td>BIOCORE 381 Evolution, Ecology, and Genetics</td>
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<td></td>
<td>BIOCORE 382 Evolution, Ecology, and Genetics Laboratory</td>
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<tr>
<td></td>
<td>BIOCORE 383 Cellular Biology</td>
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<tr>
<td></td>
<td>BIOCORE 384 Cellular Biology Laboratory</td>
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<td>Economics</td>
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<tr>
<td>A A E 215</td>
<td>Introduction to Agricultural and Applied Economics</td>
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<tr>
<td>ECON 101</td>
<td>Principles of Microeconomics</td>
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<tr>
<td>ECON 111</td>
<td>Principles of Economics-Accelerated Treatment</td>
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<td>Foundation</td>
<td>Select 8 credits from any foundation category</td>
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<tr>
<td>Core</td>
<td>AGRONOMY 100 Principles and Practices in Crop Production</td>
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<tr>
<td>SOIL SCI 301</td>
<td>General Soil Science</td>
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<tr>
<td>PL PATH 300</td>
<td>Introduction to Plant Pathology</td>
<td>4</td>
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<tr>
<td>Select one of the following:</td>
<td>GENETICS 466 Principles of Genetics</td>
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<tr>
<td>AGRONOMY/HORT 338</td>
<td>Plant Breeding and Biotechnology</td>
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<tr>
<td>Select one of the following:</td>
<td>ENTOM/ZOOLOGY 302 Introduction to Entomology</td>
<td>3-4</td>
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<tr>
<td>ENOM 351</td>
<td>Principles of Economic Entomology</td>
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<tr>
<td>Select one of the following:</td>
<td>AGRONOMY/BOTANY/SOIL SCI 370 Grassland Ecology</td>
<td>3-4</td>
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<tr>
<td>BOTANY/F&amp;W ECOL 455</td>
<td>The Vegetation of Wisconsin</td>
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<tr>
<td>BOTANY/F&amp;W ECOL/ZOOLOGY 460 General Ecology</td>
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<tr>
<td>ENOM 342</td>
<td>Insect Ecology</td>
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<tr>
<td>ENVIR ST/LAND ARC 361 Wetlands Ecology</td>
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<tr>
<td>Electives within the Major</td>
<td>Select 14 additional credits of Agronomy courses</td>
<td>14</td>
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<td>Capstone</td>
<td>AGRONOMY 500 Senior Capstone Experience</td>
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<td>Total Credits</td>
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<td>71-79</td>
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1 No more than 3 credits total in AGRONOMY 299 Independent Study, AGRONOMY 399 Coordinative Internship/Cooperative Education, AGRONOMY 699 Special Problems. Credits used to satisfy the Capstone experience may not count here.

## FOUNDATION COURSES

### AG SOCIAL SCIENCE

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>A A E 319</td>
<td>The International Agricultural Economy</td>
<td>3</td>
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<tr>
<td>A A E 320</td>
<td>Farming Systems Management</td>
<td>3</td>
</tr>
<tr>
<td>A A E 322</td>
<td>Commodity Markets</td>
<td>3</td>
</tr>
<tr>
<td>A A E 323</td>
<td>Cooperatives</td>
<td>3</td>
</tr>
<tr>
<td>A A E/ECON 421</td>
<td>Economic Decision Analysis</td>
<td>4</td>
</tr>
<tr>
<td>A A E/ECON 474</td>
<td>Economic Problems of Developing Areas</td>
<td>3</td>
</tr>
<tr>
<td>Code</td>
<td>Title</td>
<td>Credits</td>
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<tr>
<td>C&amp;E SOC/SOC 140</td>
<td>Introduction to Community and Environmental Sociology</td>
<td>3</td>
</tr>
<tr>
<td>C&amp;E SOC/SOC 222</td>
<td>Food, Culture, and Society</td>
<td>3</td>
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<tr>
<td>C&amp;E SOC/HIST SCI 230</td>
<td>Agriculture and Social Change in Western History</td>
<td>3</td>
</tr>
<tr>
<td>C&amp;E SOC/AMER IND/</td>
<td>Poverty and Place</td>
<td>3</td>
</tr>
<tr>
<td>SOC 578</td>
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<tr>
<td>C&amp;E SOC/SOC 650</td>
<td>Sociology of Agriculture</td>
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**ANIMAL SCIENCE**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>AN SCI/DY SCI 101</td>
<td>Introduction to Animal Sciences</td>
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<tr>
<td>AN SCI 200</td>
<td>The Biology and Appreciation of Companion Animals</td>
<td>3</td>
</tr>
<tr>
<td>AN SCI 250</td>
<td>Horse Science and Management</td>
<td>3</td>
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<tr>
<td>AN SCI/DY SCI/</td>
<td>Comparative Animal Nutrition</td>
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</tr>
<tr>
<td>NUTR SCI 311</td>
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<tr>
<td>AN SCI 430</td>
<td>Sheep Production</td>
<td>3</td>
</tr>
<tr>
<td>AN SCI 431</td>
<td>Beef Cattle Production</td>
<td>3</td>
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<tr>
<td>AN SCI 432</td>
<td>Swine Production</td>
<td>3</td>
</tr>
<tr>
<td>DY SCI 205</td>
<td>Dairy Cattle Improvement Programs</td>
<td>2</td>
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<tr>
<td>DY SCI 305</td>
<td>Lactation Physiology</td>
<td>3</td>
</tr>
<tr>
<td>DY SCI/AN SCI 361</td>
<td>Introduction to Animal and Veterinary Genetics</td>
<td>2</td>
</tr>
<tr>
<td>DY SCI/AN SCI 363</td>
<td>Principles of Animal Breeding</td>
<td>2</td>
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<tr>
<td>DY SCI/AN SCI 370</td>
<td>Livestock Production and Health in Agricultural Development</td>
<td>3</td>
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<tr>
<td>ENTOM/ZOOLOGY 302</td>
<td>Introduction to Entomology</td>
<td>4</td>
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<tr>
<td>ENTOM 351</td>
<td>Principles of Economic Entomology</td>
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**ATMOSPHERIC SCIENCE**

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<tbody>
<tr>
<td>ATM OCN 100</td>
<td>Weather and Climate</td>
<td>3</td>
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<tr>
<td>ATM OCN/ENVIR ST 171</td>
<td>Global Change: Atmospheric Issues and Problems</td>
<td>2-3</td>
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**BIOLOGICAL SYSTEMS ENGINEERING**

<table>
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<th>Code</th>
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<tbody>
<tr>
<td>BSE 201</td>
<td>Land Surveying Fundamentals</td>
<td>1</td>
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<tr>
<td>BSE 243</td>
<td>Operating and Management</td>
<td>3</td>
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**FOOD SCIENCE**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>FOOD SCI 120</td>
<td>Science of Food</td>
<td>3</td>
</tr>
<tr>
<td>FOOD SCI 440</td>
<td>Principles of Food Engineering</td>
<td>3</td>
</tr>
<tr>
<td>A A E/C&amp;E SOC/SOC 340</td>
<td>Issues in Food Systems</td>
<td>3-4</td>
</tr>
<tr>
<td>NUTR SCI/BIOCHEM 510</td>
<td>Biochemical Principles of Human and Animal Nutrition</td>
<td>3</td>
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**MANAGEMENT**

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<tr>
<th>Code</th>
<th>Title</th>
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<tbody>
<tr>
<td>ACCT I S 211</td>
<td>Introductory Managerial Accounting</td>
<td>3</td>
</tr>
<tr>
<td>ACCT I S 301</td>
<td>Financial Reporting I</td>
<td>3</td>
</tr>
<tr>
<td>ACCT I S 302</td>
<td>Financial Reporting II</td>
<td>3</td>
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<tr>
<td>A A E 320</td>
<td>Farming Systems Management</td>
<td>3</td>
</tr>
<tr>
<td>A A E 322</td>
<td>Commodity Markets</td>
<td>3</td>
</tr>
<tr>
<td>A A E 323</td>
<td>Cooperatives</td>
<td>3</td>
</tr>
<tr>
<td>A A E 419</td>
<td>Agricultural Finance</td>
<td>3</td>
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<tr>
<td>A A E/ECON 421</td>
<td>Economic Decision Analysis</td>
<td>4</td>
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<tr>
<td>A A E/ECON 474</td>
<td>Economic Problems of Developing Areas</td>
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<tr>
<td>GEN BUS 301</td>
<td>Business Law</td>
<td>3</td>
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<tr>
<td>GEN BUS 302</td>
<td>Business Organizations and Negotiable Instruments</td>
<td>3</td>
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<tr>
<td>FINANCE/ECON 300</td>
<td>Introduction to Finance</td>
<td>3</td>
</tr>
<tr>
<td>INTL BUS 200</td>
<td>International Business</td>
<td>3</td>
</tr>
<tr>
<td>MARKETNG 305</td>
<td>Consumer Behavior</td>
<td>3</td>
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<tr>
<td>MARKETNG 310</td>
<td>Marketing Research</td>
<td>3</td>
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<tr>
<td>MARKETNG/INTL BUS 420</td>
<td>Global Marketing Strategy</td>
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<td>MARKETNG 460</td>
<td>Marketing Strategy</td>
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<tr>
<td>MARKETNG 635</td>
<td>Sales Management</td>
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<tr>
<td>MARKETNG 640</td>
<td>Strategic Retailing</td>
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<tr>
<td>M HR 420</td>
<td>Managing Change and Organizational Effectiveness</td>
<td>3</td>
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<tr>
<td>M HR 422</td>
<td>Entrepreneurial Management</td>
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<td>M HR 612</td>
<td>Labor-Management Relations</td>
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<tr>
<td>R M I 300</td>
<td>Principles of Risk Management</td>
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**NUTRITIONAL SCIENCE**

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<tbody>
<tr>
<td>NUTR SCI 132</td>
<td>Nutrition Today</td>
<td>3</td>
</tr>
<tr>
<td>NUTR SCI/AN SCI/DY SCI 311</td>
<td>Comparative Animal Nutrition</td>
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<tr>
<td>NUTR SCI 332</td>
<td>Human Nutritional Needs</td>
<td>3</td>
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<tr>
<td>NUTR SCI/A A E/AGRONOMY/INTER-AG 350</td>
<td>World Hunger and Malnutrition</td>
<td>3</td>
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<tr>
<td>NUTR SCI 540</td>
<td>Community Nutrition Programs and Policy Issues</td>
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**SOIL SCIENCE**

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<tbody>
<tr>
<td>SOIL SCI/ENVIR ST 324</td>
<td>Soils and Environmental Quality</td>
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<td>SOIL SCI 325</td>
<td>Soils and Landscapes</td>
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**BACTERIOLOGY, BIOCHEMISTRY, GENETICS**

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<tbody>
<tr>
<td>MICROBIO 101</td>
<td>General Microbiology</td>
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<tr>
<td>MICROBIO 102</td>
<td>General Microbiology Laboratory</td>
<td>2</td>
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<tr>
<td>MICROBIO 303</td>
<td>Biology of Microorganisms</td>
<td>3</td>
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<tr>
<td>MICROBIO 304</td>
<td>Biology of Microorganisms</td>
<td>2</td>
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<tr>
<td>MICROBIO/FOOD SCI 324</td>
<td>Food Microbiology Laboratory</td>
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FOUR-YEAR PLAN

SAMPLE AGRONOMY FOUR-YEAR PLAN

Freshman

Fall  Credits  Spring  Credits
AGRONOMY 100  4  BOTANY/BIOLOGY  130  5
CHEM 103 or 109  4-5  CHEM 104 (or Elective)  5 (3)
MATH 112, 114, or 1711  3-5  Elective  3
COMM A  3  ECON 101, 111, or A A E  215  3-4
First Year Seminar  1

Total Credits 26-35

Sophomore

Fall  Credits  Spring  Credits
Foundation Course2  3  Foundation Courses  5
ZOOLOGY/BIOLOGY  101  or 102  2-3  Social Science Course  3
Statistics Course  3  Agronomy Course3  3
Ethnic Studies Course  3  COMM B  3

11-12  14

Total Credits 25-26

Sophomore

Summer

Internship or Agronomy  1-3
Independent Study  1-3

Total Credits 1-3

Junior

Fall  Credits  Spring  Credits
Agronomy Courses  6  ENTOM/ZOOLOGY  302  3-4
or 351
GENETICS 466  3  Agronomy Course  3
SOIL SCI 301  4  International Studies Course  3
Elective  3  Humanities Elective Course  3
Elective  3

16  15-16

Total Credits 31-32

Junior

Summer

Internship or Agronomy  1-3
Independent Study  1-3

Total Credits 1-3
Agronomy, B.S.

### Senior

<table>
<thead>
<tr>
<th>Fall</th>
<th>Credits Spring</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Agronomy Course</td>
<td>3-4 Agronomy Courses</td>
<td>6-7</td>
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<tr>
<td>ZOOLOGY/BOTANY/</td>
<td>4 Capstone</td>
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</tr>
<tr>
<td>F&amp;W ECOL - 460</td>
<td>4 Electives</td>
<td>6-9</td>
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<tr>
<td>PL PATH 300</td>
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<tr>
<td>Humanities Course</td>
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<tr>
<td>Elective</td>
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</table>

Total Credits 31-36

2. Eight (8) credits of Foundation courses required. See Requirements tab for details.
3. Fourteen (14) credits of agronomy electives required. See Requirements tab for details.

### ADVISING AND CAREERS

#### ADVISING

The Department of Agronomy is faculty-advised, meaning that faculty members take on the responsibility of guiding and advising undergraduates through graduation. Students and faculty are matched as closely as possible by interest. All new freshmen and transfer students are temporarily advised by the student services coordinator until the advising relationship between professor and student is established. If you would like to have a conversation about joining the agronomy department, please contact Joanna Schuth.

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Student Services Coordinator
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#### CAREERS

An agronomy degree is an open door to careers in many related fields such as biotechnology, plant genetics, crop management, agricultural financial management, farming, seed sales, crop consulting, Certified Crop Advising, Certified Professional Agronomy, agribusiness, extension agronomy, agricultural education, government work, and international agronomy.

#### GENETICS

The fastest growing sector of agriculture is plant breeding, genetics, and genomics. Plant scientists are working at the field, plant, cellular, and molecular level to create cultivars that are hardier, disease resistant, nutritious, and affordable. The industry’s growth is currently outstripping the rate of graduation; graduates can take their pick of interesting, fulfilling careers in the public and private sectors.

#### BIOFUELS

The biofuel industry is also experiencing rapid growth, with research and development being focused on sugar-based biofuels, cellulosic biofuels, and biodiesels, made from plants as varied as switchgrass, sugar cane, corn, and wood pulp. These energy crops are harvested and processed into alternatives to fossil fuels.

#### AGribusiness

In agribusiness agronomists take data and translate it into real world applications. They sell tools for crop production, provide agricultural loans, consult on crops, manage businesses, and much more. They are often responsible for translating technical research data into applications. Numerous agronomy graduates are also involved in the sale of agricultural products, which are vital to today’s economy. Other successful agronomists serve as crop advisers, farm managers, consultants, bank loan specialists, managers, and much more.

#### RESEARCH/EDUCATION AND EXTENSION

Agronomic educators specialize in teaching and working with high school and college students. They also teach and advise students who chose advanced studies for a master’s degree and/or Ph.D. They are extensively involved in research, publishing findings on a regular basis and making scientific advances.

Extension agronomists usually work for a state, local, or national government; they consult with farmers and others to help find answers to their specific problems and help farmers translate research results into usable management practices. Government-employed agronomists also work with farmers and ranchers to plan for soil and water conservation so crops and land can be managed efficiently and with minimal impact to the environment.

#### PEOPLE

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WISCONSIN EXPERIENCE

The following opportunities can help students connect with other students interested in agronomy, build relationships with faculty and staff, and contribute to out-of-classroom learning:

- Badger Crops Club (https://www.facebook.com/badgercropsclub), a professional, social, and educational group for agronomy students and students in related fields interested in any aspect of crop production.

- Collegiate FFA (http://collegiateffamadison.weebly.com), an official collegiate chapter of the National FFA organization.

- AWA (http://awamadison.org)—the Association of Women in Agriculture, a professional student organization for young women with a passion for agriculture.

- WISELI (http://wiseli.engr.wisc.edu)—Women in Science and Engineering Leadership Institute, a research center aiming to increase the representation, advancement, and satisfaction of women faculty and members of groups currently underrepresented on the faculty and in leadership at UW–Madison.

- Study Abroad: Agronomy majors have the opportunity to go on experiential study abroad programs, where students can immerse themselves in research or global agronomy field experiences. Students can review the International Academic Programs website (https://www.studyabroad.wisc.edu/programs/results.asp?region=&country=any&duration=any&language=any&opento=any&searchtext=7&submit=Search) and the CALS study abroad advising page (https://cals.wisc.edu/academics/undergraduate-students/international-programs/study-abroad-advising) for information on these and other programs, as well as requirements that can typically be fulfilled abroad and things to consider when fitting study abroad into an academic plan.

- Research/Lab experience: Students are encouraged to get involved in research, whether in the agronomy department or through other plant-, soil-, or ecology-related departments. Research can be performed for either course credit or pay, depending on the opportunity. Research opportunities can primarily be found by inquiring with faculty members.