SOIL SCIENCE, B.S.

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/#requirementsforundergraduatetestudytext) section of the Guide.

General Education

- Breadth—Humanities/Literature/Arts: 6 credits
- 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
- Breadth—Social Studies: 3 credits
- Communication Part A & Part B *
- Ethnic Studies *
- Quantitative Reasoning Part A & Part B *

* 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. Courses may not double count within university requirements (General Education and Breadth) or within college requirements (First-Year Seminar, International Studies, Science, and Capstone), but courses counted toward university requirements may also be used to satisfy a college requirement 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>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of Work: Students must maintain a minimum cumulative grade point average of 2.000 to remain in good standing and be eligible for graduation. Residency: Students must complete 30 degree credits in residence at UW–Madison after earning 86 credits toward their undergraduate degree. First Year Seminar (<a href="http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#requirementstext">http://guide.wisc.edu/undergraduate/agricultural-life-sciences/#requirementstext</a>)</td>
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</table>

MAJOR REQUIREMENTS

Courses may not double count within the major (unless specifically noted otherwise), but courses counted toward the major requirements may also be used to satisfy a university requirement and/or a college requirement. A minimum of 15 credits must be completed in the major that are not used elsewhere.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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</table>
| Mathematics and Statistics
Select one of the following courses: |
MATH 112 | Algebra                                           | 3-5     |
MATH 114 | Algebra and Trigonometry                        |         |
MATH 171 | Calculus with Algebra and Trigonometry I ¹       |         |
Select one of the following courses: |
STAT 371 | Introductory Applied Statistics for the Life Sciences (recommended) | 3-4     |
STAT/F&W ECOL/HORT 571 | Statistical Methods for Bioscience I |
Chemistry
Select one of the following options: |
CHEM 103 & CHEM 104 | General Chemistry I and General Chemistry II | 5-9     |
Option 1:
CHEM 109 | Advanced General Chemistry                      |         |
Option 2:
BOTANY/BIOLOGY 130 | General Botany ²                               |         |
ZOOLOGY/BIOLOGY 101 | Animal Biology                                 |         |
ZOOLOGY/BIOLOGY 102 | Animal Biology Laboratory                      |         |
Option 2:
BIOLOGY/BOTANY/ZOOLOGY 151 | Introductory Biology                           |         |

¹ Additional Science (Biological, Physical, or Natural) 3
² Additional Science (Biological, Physical, or Natural) 3
³ Additional Science (Biological, Physical, or Natural) 3
INTRODUCTORY BIOLOGY

Option 3:

**BIOCORE 381** Evolution, Ecology, and Genetics

**BIOCORE 382** Evolution, Ecology, and Genetics Laboratory

**BIOCORE 383** Cellular Biology

**BIOCORE 384** Cellular Biology Laboratory

**Core**

**SOIL SCI 301** General Soil Science 4

**SOIL SCI 325** Soils and Landscapes 3

Select one of the following courses: 3

**SOIL SCI 321** Soils and Environmental Chemistry

**SOIL SCI 621** Soil Chemistry

**SOIL SCI/AGRONOMY/HORT 326** Plant Nutrition Management

**SOIL SCI/BOTANY/HORT 626** Mineral Nutrition of Plants

Select one of the following courses: 3

**SOIL SCI 322** Physical Principles of Soil and Water Management

**SOIL SCI 622** Soil Physics

Select one of the following courses: 3

**SOIL SCI/PL PATH 323** Soil Biology

**SOIL SCI/MICROBIO 425** Environmental Microbiology

**SOIL SCI/MICROBIO 523** Soil Microbiology and Biochemistry

**Specialization**

Students must complete 1 of 3 specializations: 1. 28-51

Environmental Soil Science 2. Soil and Food Systems 3. Turf and Grounds (see below)

**Capstone** 3

Select one of the following courses: 3-4

**SOIL SCI 499** Soil Management 4

**ENVIR ST/SOIL SCI 575** Assessment of Environmental Impact

**F&W ECOL/A A E/ENVIR ST 652** Decision Methods for Natural Resource Managers

**Total Credits** 68-99

1

Note that MATH 171 & MATH 217 must be taken as a sequence.

2

BOTANY/BIOLOGY 130 is required by the Turf and Grounds Track.

3

Consult advisor to request permission to substitute another course for the Capstone requirement. Course must meet CALS Capstone Characteristics described in the Undergraduate Catalog and be approved by advisor and 116 Ag Hall.

4

SOIL SCI 499 capstone required for Turf and Grounds Track.

**SPECIALIZATIONS WITHIN THE MAJOR**

**ENVIRONMENTAL SOIL SCIENCE**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td></td>
<td><strong>Mathematics</strong></td>
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<td>Select one of the following courses:</td>
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<tr>
<td></td>
<td>MATH 211 Calculus</td>
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<td></td>
<td>MATH 221 Calculus and Analytic Geometry 1</td>
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<td></td>
<td>MATH 217 Calculus with Algebra and Trigonometry II</td>
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<td></td>
<td><strong>Physics</strong></td>
<td>4-5</td>
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<td>Select one of the following courses:</td>
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<tr>
<td></td>
<td>PHYSICS 103 General Physics (recommended)</td>
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<td></td>
<td>PHYSICS 104 General Physics</td>
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<td>PHYSICS 207 General Physics</td>
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<td></td>
<td>PHYSICS 208 General Physics</td>
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<tr>
<td></td>
<td><strong>Chemistry</strong></td>
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<td>Select one of the following options:</td>
<td>4-8</td>
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<td>Option 1:</td>
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<tr>
<td></td>
<td>CHEM 311 Chemistry Across the Periodic Table</td>
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<td>CHEM 327 or CHEM 329 Fundamentals of Analytical Science</td>
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<td>CHEM 329 Fundamentals of Analytical Science</td>
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<td>Option 2:</td>
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<td></td>
<td>CHEM 341 &amp; CHEM 342 Elementary Organic Chemistry and Elementary Organic Chemistry Laboratory</td>
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<td>Option 3:</td>
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<td></td>
<td>CHEM 343 &amp; CHEM 344 &amp; CHEM 345 Organic Chemistry I and Introductory Organic Chemistry Laboratory and Organic Chemistry II</td>
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<td><strong>Physical Environment</strong></td>
<td>6-8</td>
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<td>Select one course from the following:</td>
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<tr>
<td></td>
<td>ATM OCN 100 Weather and Climate</td>
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<td></td>
<td>ATM OCN 101 Weather and Climate</td>
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<td></td>
<td>ATM OCN/SOIL SCI 132 Earth’s Water: Natural Science and Human Use</td>
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<td></td>
<td>GEOG/ENVIR ST 120 Introduction to the Earth System</td>
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<td>GEOG/ENVIR ST 127 Physical Systems of the Environment</td>
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<td></td>
<td>GEOSCI/ENVIR ST 106 Environmental Geology</td>
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<td>GEOSCI 202 Introduction to Geologic Structures</td>
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<td>SOIL SCI 131 Earth’s Soil: Natural Science and Human Use</td>
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<td>SOIL SCI 321 Soils and Environmental Chemistry</td>
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<td></td>
<td>SOIL SCI/AGRONOMY/HORT 326 Plant Nutrition Management</td>
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</table>

Select at least one course from the following:
### Soil Science, B.S.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>GEOG/CIV ENGR 320</td>
<td>Geomorphology</td>
</tr>
<tr>
<td>ATM OCN/ GEOG 323</td>
<td>Science of Climate Change</td>
</tr>
<tr>
<td>SOIL SCI/ ENVIR ST 324</td>
<td>Soils and Environmental Quality</td>
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<tr>
<td>SOIL SCI/ F&amp;W ECOL/ HORT 524</td>
<td>Urban Soil and Environment</td>
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<tr>
<td>SOIL SCI 621</td>
<td>Soil Chemistry</td>
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<tr>
<td>SOIL SCI 622</td>
<td>Soil Physics</td>
</tr>
<tr>
<td>SOIL SCI/ BOTANY/ HORT 626</td>
<td>Mineral Nutrition of Plants</td>
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<tr>
<td>AGRONOMY/ATM OCN/SOIL SCI 532</td>
<td>Environmental Biophysics</td>
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<tr>
<td>F&amp;W ECOL/ LAND ARC/ ZOOLOGY 565</td>
<td>Principles of Landscape Ecology</td>
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<tr>
<td>GEOG 578</td>
<td>GIS Applications</td>
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</tbody>
</table>

### Living Environment

Select one course from the following:

- AGRONOMY 100: Principles and Practices in Crop Production
- AGRONOMY 300: Cropping Systems
- GEOG/ ENVIR ST 309: People, Land and Food: Comparative Study of Agriculture Systems
- ZOOLOGY/ ENVIR ST 315: Limnology-Conservation of Aquatic Resources
- HORT 345: Fruit Crop Production
- HORT 370: World Vegetable Crops
- AGROECOL 400: Study Abroad in Agroecology
- SOIL SCI/ AGRONOMY/ BOTANY 370: Grassland Ecology
- SOIL SCI/ MICROBIO 425: Environmental Microbiology
- SOIL SCI/ MICROBIO 523: Soil Microbiology and Biochemistry

Select one course from the following:

- BOTANY/F&W ECOL/ZOOLOGY 460: General Ecology
- GENETICS 466: Principles of Genetics
- BOTANY 500: Plant Physiology
- SOIL SCI/ MICROBIO 523: Soil Microbiology and Biochemistry
- GENETICS 545: Genetics Laboratory
- BOTANY 563: Phylogenetic Analysis of Molecular Data
- SOIL SCI/ BOTANY/ HORT 626: Mineral Nutrition of Plants

### Environmental Policy, Management, and Analysis

Select one of the following options:

**Option 1:**

- MICROBIO 101
- MICROBIO 102

**Option 2:**

- MICROBIO 303
- MICROBIO 304

**Option 3:**

- BOTANY 330
- Algae and Fungi

### Other Courses

Select one of the following courses:

- SOIL SCI/ENVIR ST 575: Assessment of Environmental Impact
- GEOG/ SOIL SCI 526: Human Transformations of Earth Surface Processes
### SOIL AND FOOD SYSTEMS

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td><strong>Physical Environment</strong></td>
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<td>8-10</td>
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</table>

Select one of the following courses:

- ATM OCN 100 Weather and Climate
- SOIL SCI/ ATM OCN 132 Earth's Water: Natural Science and Human Use
- ATM OCN 101 Weather and Climate
- ATM OCN/ GEOG 323 Science of Climate Change
- GEOG/ ENVIR ST 120 Introduction to the Earth System
- GEOG/ ENVIR ST 127 Physical Systems of the Environment
- GEOSCI 100 Introductory Geology: How the Earth Works
- GEOSCI/ ENVIR ST 106 Environmental Geology
- SOIL SCI/ ENVIR ST 324 Soils and Environmental Quality
- SOIL SCI 321 Soils and Environmental Chemistry
- SOIL SCI/ AGRONOMY/ HORT 326 Plant Nutrition Management
- SOIL SCI/ F&W ECOL 451 Environmental Biogeochemistry
- SOIL SCI/ F&W ECOL/ HORT 524 Urban Soil and Environment

Select one of the following courses:

- F&W ECOL/ ZOOLOGY 565 Principles of Landscape Ecology
- GEOG/CIV ENGR 320 Geomorphology
- GEOG 578 GIS Applications
- GEOG 579 GIS and Spatial Analysis
- SOIL SCI 131 Earth's Soil: Natural Science and Human Use
- SOIL SCI/ F&W ECOL 451 Environmental Biogeochemistry
- SOIL SCI/ MICROBIO 523 Soil Microbiology and Biochemistry
- SOIL SCI 621 Soil Chemistry
- SOIL SCI 622 Soil Physics
- SOIL SCI/ BOTANY/ HORT 626 Mineral Nutrition of Plants

Select one of the following courses:

- ENVIR ST/ F&W ECOL/ GLE/ GEOG/GEOSCI/ LAND ARC 371 Introduction to Environmental Remote Sensing
- ENVIR ST/ F&W ECOL/ GLE/ GEOG/GEOSCI/ LAND ARC 372 Intermediate Environmental Remote Sensing
- ENVIR ST/LAND ARC/SOIL SCI 695 Applications of Geographic Information Systems in Natural Resources

### Economics and Food Management

<table>
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<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<td><strong>6-8</strong></td>
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Select one of the following courses:

- ACCT I S 100 Introductory Financial Accounting
- ACCT I S 211 Introductory Managerial Accounting
- ACCT I S 300 Accounting Principles
- ACCT I S 301 Financial Reporting I
- ACCT I S/ LAW 329 Taxation: Concepts for Business and Personal Planning
- A A E 215 Introduction to Agricultural and Applied Economics
- A A E 320 Agricultural Systems Management
- A A E 322 Commodity Markets
- A A E 323 Cooperatives and Alternative Forms of Enterprise Ownership
- A A E 419 Agricultural Finance
- A A E/ECON 421 Economic Decision Analysis
- A A E/ECON 474 Economic Problems of Developing Areas
- M H R 305 Human Resource Management
- M H R 610 Compensation: Theory and Administration
- M H R 611 Personnel Staffing and Evaluation
- M H R 612 Labor-Management Relations

Select one of the following courses:

- ECON 101 Principles of Microeconomics
- ECON 111 Principles of Economics-Accelerated Treatment
- ACCT I S 100 Introductory Financial Accounting
- ACCT I S 211 Introductory Managerial Accounting
- ACCT I S 300 Accounting Principles
- ACCT I S 301 Financial Reporting I
- ACCT I S/ LAW 329 Taxation: Concepts for Business and Personal Planning
- A A E 320 Agricultural Systems Management
- A A E 322 Commodity Markets
- A A E 323 Cooperatives and Alternative Forms of Enterprise Ownership
- A A E 419 Agricultural Finance
- A A E/ECON 421 Economic Decision Analysis
- A A E/ECON 474 Economic Problems of Developing Areas

Select one of the following courses:

- SOIL SCI/ MICROBIO 425 Environmental Microbiology
SOIL SCI/MICROBIO 523  Soil Microbiology and Biochemistry
M H R 305  Human Resource Management
M H R 610  Compensation: Theory and Administration
M H R 611  Personnel Staffing and Evaluation
M H R 612  Labor-Management Relations

Specialized Sciences (complete all) 1

AGRONOMY 100 Principles and Practices in Crop Production 3-4
or HORT 120 Survey of Horticulture
AGRONOMY 300 Cropping Systems 3
or AGRONOMY 302 Forage Management and Utilization
or HORT 345 Fruit Crop Production
AGRONOMY/HORT/SOIL SCI 326 Plant Nutrition Management 3
PL PATH 300 Introduction to Plant Pathology 4
or ENTOM 351 Principles of Economic Entomology
or PL PATH 368
A A E 215 Introduction to Agricultural and Applied Economics 3-4
or A A E/ENVIR ST 244 The Environment and the Global Economy
or A A E 319 The International Agricultural Economy
or A A E/AGRONOMY/NUTR SCI 350 World Hunger and Malnutrition

Total Credits 30-36

1 Some courses may fulfill GEN ED requirements.

TURF AND GROUNDS

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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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 101</td>
<td>Weather and Climate</td>
<td></td>
</tr>
<tr>
<td>SOIL SCI/ATM OCN 132</td>
<td>Earth's Water: Natural Science and Human Use</td>
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<tr>
<td>GEOG/ENVIR ST 120</td>
<td>Introduction to the Earth System</td>
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<td>GEOG/ENVIR ST 127</td>
<td>Physical Systems of the Environment</td>
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<tr>
<td>GEOSCI 100</td>
<td>Introductory Geology: How the Earth Works</td>
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<tr>
<td>GEOSCI/ENVIR ST 106</td>
<td>Environmental Geology</td>
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Core Turf and Grounds Sciences (complete all)

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ACCT I S 300</td>
<td>Accounting Principles</td>
<td>3</td>
</tr>
<tr>
<td>BOTANY/BIOLOGY 130</td>
<td>General Botany 1</td>
<td>5</td>
</tr>
<tr>
<td>HORT/PL PATH 261</td>
<td>Sustainable Turfgrass Use and Management</td>
<td>2</td>
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<tr>
<td>M H R 305</td>
<td>Human Resource Management</td>
<td>3</td>
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PL PATH 300  Introduction to Plant Pathology 4
HORT/SOIL SCI 332  Turfgrass Nutrient and Water Management 3

Specialized Sciences 7
Select 7 credits from the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BOTANY/F&amp;W ECOL 402</td>
<td>Dendrology</td>
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<tr>
<td>HORT/LAND ARC 263</td>
<td>Landscape Plants I</td>
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<tr>
<td>BSE 201</td>
<td>Operating and Management Principles of Off-Road Vehicles</td>
<td></td>
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<tr>
<td>ENTOM 351</td>
<td>Principles of Economic Entomology</td>
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<tr>
<td>HORT 120</td>
<td>Survey of Horticulture</td>
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<tr>
<td>HORT/PL PATH 262</td>
<td>Turfgrass Management Laboratory</td>
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</table>

1 Counts toward Soil Science Major Biology requirements, above.

HONORS IN THE MAJOR

Students admitted to the university and to the College of Agricultural and Life Sciences are invited to apply to be considered for admission to the CALS Honors Program.

Admission Criteria for New First-Year Students:

• Complete program application including essay questions

Admission Criteria for Transfer and Continuing UW-Madison Students:

• UW-Madison cumulative GPA of at least 3.25
• Complete program application including essay questions

HOW TO APPLY

The application is available on the CALS Honors Program website (https://cals.wisc.edu/academics/undergraduate-students/outside-the-classroom/honors-program/). Applications are accepted at any time.

New first-year students with accepted applications will automatically be enrolled in Honors in Research. It is possible to switch to Honors in the Major in the student’s first semester on campus after receiving approval from the advisor for that major. Transfer and continuing students may apply directly to Honors in Research or Honors in the Major (after approval from the major advisor).

REQUIREMENTS

All CALS Honors programs have the following requirements:

• Earn at least a cumulative 3.25 GPA at UW-Madison (some programs have higher requirements)
• Complete the program-specific requirements listed below
• Submit completed thesis documentation to CALS Academic Affairs

REQUIREMENTS

To earn Honors in the Major, students are required to take at least 20 honors credits. In addition, students must take SOIL SCI 681 Senior Honors Thesis and SOIL SCI 682 Senior Honors Thesis when completing their thesis project; please see the Honors in Major Checklist (http://
To receive a bachelor's degree from UW–Madison, students must earn a minimum of 120 degree credits. The requirements for some programs may exceed 120 degree credits. Students should consult with their college or department advisor for information on specific credit requirements.

Degree candidates are required to earn a minimum of 30 credits in residence at UW–Madison. "In residence" means on the UW–Madison campus with an undergraduate degree classification. "In residence" credit also includes UW–Madison courses offered in distance or online formats and credits earned in UW–Madison Study Abroad/Study Away programs.

Undergraduate students must maintain the minimum grade point average specified by the school, college, or academic program to remain in good academic standing. Students whose academic performance drops below these minimum thresholds will be placed on academic probation.