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 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. A minimum of 15 credits must be completed in the major that are not used elsewhere.

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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 112</td>
<td>Algebra</td>
<td>3</td>
</tr>
<tr>
<td>MATH 114</td>
<td>Algebra and Trigonometry</td>
<td>3</td>
</tr>
<tr>
<td>MATH 171</td>
<td>Calculus with Algebra and Trigonometry</td>
<td>3</td>
</tr>
<tr>
<td>STAT 371</td>
<td>Introductory Applied Statistics for the Life Sciences (recommended)</td>
<td>3</td>
</tr>
<tr>
<td>STAT/F&amp;W ECOL/HORT 571</td>
<td>Statistical Methods for Bioscience I</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 103 &amp; CHEM 104</td>
<td>General Chemistry I and General Chemistry II</td>
<td>5</td>
</tr>
<tr>
<td>CHEM 109</td>
<td>Advanced General Chemistry</td>
<td>5</td>
</tr>
</tbody>
</table>

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.
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOIL SCI 301 &amp; SOIL SCI 302</td>
<td>General Soil Science and Meet Your Soil: Soil Analysis and Interpretation Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>SOIL SCI 325</td>
<td>Soils and Landscapes</td>
<td>3</td>
</tr>
<tr>
<td>SOIL SCI 321</td>
<td>Soils and Environmental Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>SOIL SCI 621</td>
<td>Soil Chemistry</td>
<td></td>
</tr>
<tr>
<td>SOIL SCI/AGRONOMY/HORT 326</td>
<td>Plant Nutrition Management</td>
<td></td>
</tr>
<tr>
<td>SOIL SCI/BOTANY/HORT 626</td>
<td>Mineral Nutrition of Plants</td>
<td></td>
</tr>
<tr>
<td>SOIL SCI 322</td>
<td>Physical Principles of Soil and Water Management</td>
<td>3</td>
</tr>
<tr>
<td>SOIL SCI 622</td>
<td>Soil Physics</td>
<td></td>
</tr>
<tr>
<td>SOIL SCI/PL PATH 323</td>
<td>Soil Biology</td>
<td></td>
</tr>
<tr>
<td>SOIL SCI/MICROBIO 425</td>
<td>Environmental Microbiology</td>
<td></td>
</tr>
<tr>
<td>SOIL SCI/MICROBIO 523</td>
<td>Soil Microbiology and Biochemistry</td>
<td></td>
</tr>
</tbody>
</table>

**Mathematics**

Select one of the following courses:

- MATH 211  Calculus
- MATH 221  Calculus and Analytic Geometry I
- MATH 217  Calculus with Algebra and Trigonometry II

**Physics**

Select one of the following courses:

- PHYSICS 103  General Physics (recommended)
- PHYSICS 104  General Physics
- PHYSICS 207  General Physics
- PHYSICS 208  General Physics

**Chemistry**

Select one of the following options:

**Option 1:**

- CHEM 311  Chemistry Across the Periodic Table
- CHEM 327 or CHEM 329  Fundamentals of Analytical Science

**Option 2:**

- CHEM 341 & CHEM 342  Elementary Organic Chemistry and Elementary Organic Chemistry Laboratory

**Option 3:**

- CHEM 343 & CHEM 344 & CHEM 345  Organic Chemistry I and Introductory Organic Chemistry Laboratory and Organic Chemistry II

**Physical Environment**

Select one course from the following:

- ATM OCN 100  Weather and Climate
- ATM OCN 101  Weather and Climate
- ATM OCN/SOIL SCI 132  Earth’s Water: Natural Science and Human Use
- GEOG/ENVIR ST 120  Introduction to the Earth System
- GEOG/ENVIR ST 127  Physical Systems of the Environment
- GEOSCI/ENVIR ST 106  Environmental Geology
- GEOSCI 202  Introduction to Geologic Structures

**Specializations within the Major**

**Environmental Soil Science**

**Mathematics**

Select one of the following courses:

- MATH 211  Calculus
- MATH 221  Calculus and Analytic Geometry I
- MATH 217  Calculus with Algebra and Trigonometry II

**Physics**

Select one of the following courses:

- PHYSICS 103  General Physics (recommended)
- PHYSICS 104  General Physics
- PHYSICS 207  General Physics
- PHYSICS 208  General Physics

**Chemistry**

Select one of the following options:

**Option 1:**

- CHEM 311  Chemistry Across the Periodic Table
- CHEM 327 or CHEM 329  Fundamentals of Analytical Science

**Option 2:**

- CHEM 341 & CHEM 342  Elementary Organic Chemistry and Elementary Organic Chemistry Laboratory

**Option 3:**

- CHEM 343 & CHEM 344 & CHEM 345  Organic Chemistry I and Introductory Organic Chemistry Laboratory and Organic Chemistry II

**Physical Environment**

Select one course from the following:

- ATM OCN 100  Weather and Climate
- ATM OCN 101  Weather and Climate
- ATM OCN/SOIL SCI 132  Earth’s Water: Natural Science and Human Use
- GEOG/ENVIR ST 120  Introduction to the Earth System
- GEOG/ENVIR ST 127  Physical Systems of the Environment
- GEOSCI/ENVIR ST 106  Environmental Geology
- GEOSCI 202  Introduction to Geologic Structures
SOIL SCI 131  Earth's Soil: Natural Science and Human Use
SOIL SCI 321  Soils and Environmental Chemistry
SOIL SCI/AGRONOMY/HORT 326  Plant Nutrition Management

Select at least one course from the following:
- GEOG/CIV ENGR 320  Geomorphology
- ATM OCN/GEOG 323  Science of Climate Change
- SOIL SCI/ENVIR ST 324  Soils and Environmental Quality
- SOIL SCI/F&W ECOL/HORT 524  Urban Soil and Environment
- SOIL SCI 621  Soil Chemistry
- SOIL SCI 622  Soil Physics
- SOIL SCI/BOTANY/HORT 626  Mineral Nutrition of Plants
- AGRONOMY/ATM 532  Environmental Biophysics
- OCN/SOIL SCI 532
- F&W ECOL/LAND ARC/ZOOLOGY 565  Principles of Landscape Ecology
- GEOG 578  GIS Applications

**Living Environment**  9-14

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
- F&W ECOL 550 & F&W ECOL 551  Forest Ecology and Forest Ecology Lab
- GENETICS 466  Principles of Genetics
- BOTANY 500  Plant Physiology

SOIL SCI/MICROBIO 523  Soil Microbiology and Biochemistry

GENETICS 545  Genetics Laboratory
BOTANY/BOTANY/HORT 563  Phylogenetic Analysis of Molecular Data
SOIL SCI/BOTANY/HORT 626  Mineral Nutrition of Plants
SOIL SCI/CIV ENGR/M&ENVTOX 631  Toxicants in the Environment: Sources, Distribution, Fate, & Effects

Select one of the following options:

**Option 1:**
- MICROBIO 101 & MICROBIO 102  General Microbiology and General Microbiology Laboratory

**Option 2:**
- MICROBIO 303 & MICROBIO 304  Biology of Microorganisms and Biology of Microorganisms Laboratory

**Option 3:**
- BOTANY 330 & BOTANY/PL PATH 332  Algae and Fungi

**Environmental Policy, Management, and Analysis**  9-12

Select one of the following courses:
- SOIL SCI/ENVIR ST 101  Forum on the Environment
- ENVIR ST 112  Environmental Studies: Social Science Perspectives
- ENVIR ST 113  Environmental Studies: Environmental Humanities
- ENVIR ST/ILS 126  Principles of Environmental Science
- ENVIR ST/GEOG 127  Physical Systems of the Environment
- A A E/F&W ECOL 652  Decision Methods for Natural Resource Managers
- SOIL SCI/ENVIR ST 575  Assessment of Environmental Impact
- GEOG/ENVIR ST 575  Human Transformations of Earth Surface Processes

Select one of the following courses:
- ECON 101  Principles of Microeconomics
- ECON 111  Principles of Economics-Accelerated Treatment
- A A E 215  Introduction to Agricultural and Applied Economics
- A A E/ENVIR ST 244  The Environment and the Global Economy
- A A E 319  The International Agricultural Economy

Select one of the following courses:
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVIR ST/LAND ARC/SOIL SCI 695</td>
<td>Applications of Geographic Information Systems in Natural Resources</td>
<td>ENVIR ST/LAND ARC/SOIL SCI 695</td>
</tr>
</tbody>
</table>

**Total Credits**: 37-52

### SOIL AND FOOD SYSTEMS

#### Physical Environment: 8-10

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

### Economics and Food Management: 6-8

Select one of the following courses:

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

Select one of the following courses:

- ECON 101: Principles of Microeconomics
- ECON 111: Principles of Economics-Accelerated Treatment
- ACCT IS 100: Introductory Financial Accounting
- ACCT IS 211: Introductory Managerial Accounting
- ACCT IS 300: Accounting Principles
- ACCT IS 301: Financial Reporting I
- ACCT IS/LAW 329: Taxation: Concepts for Business and Personal Planning
- A AE 320: Agricultural Systems Management
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>A A E 322</td>
<td>Commodity Markets</td>
<td></td>
</tr>
<tr>
<td>A A E 323</td>
<td>Cooperatives and Alternative Forms of Enterprise Ownership</td>
<td></td>
</tr>
<tr>
<td>A A E 419</td>
<td>Agricultural Finance</td>
<td></td>
</tr>
<tr>
<td>A A E/ECON 421</td>
<td>Economic Decision Analysis</td>
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<tr>
<td>M H R 305</td>
<td>Human Resource Management</td>
<td></td>
</tr>
<tr>
<td>M H R 610</td>
<td>Compensation: Theory and Administration</td>
<td></td>
</tr>
<tr>
<td>M H R 611</td>
<td>Strategic Talent Management</td>
<td></td>
</tr>
<tr>
<td>M H R 612</td>
<td>Labor-Management Relations</td>
<td></td>
</tr>
<tr>
<td>Specialized Sciences (complete all)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGRONOMY 100</td>
<td>Principles and Practices in Crop Production</td>
<td>3-4</td>
</tr>
<tr>
<td>or HORT 120</td>
<td>Survey of Horticulture</td>
<td></td>
</tr>
<tr>
<td>AGRONOMY 300</td>
<td>Cropping Systems</td>
<td>3</td>
</tr>
<tr>
<td>or AGRONOMY 302</td>
<td>Forage Management and Utilization</td>
<td></td>
</tr>
<tr>
<td>or HORT 345</td>
<td>Fruit Crop Production</td>
<td></td>
</tr>
<tr>
<td>AGRONOMY/HORT/ SOIL SCI 326</td>
<td>Plant Nutrition Management</td>
<td>3</td>
</tr>
<tr>
<td>PL PATH 300</td>
<td>Introduction to Plant Pathology</td>
<td>3-4</td>
</tr>
<tr>
<td>or ENTOM 351</td>
<td>Principles of Economic Entomology</td>
<td></td>
</tr>
<tr>
<td>A A E 215</td>
<td>Introduction to Agricultural and Applied Economics</td>
<td>3-4</td>
</tr>
<tr>
<td>or A A E/ ENVIR ST 244</td>
<td>The Environment and the Global Economy</td>
<td></td>
</tr>
<tr>
<td>or A A E 319</td>
<td>The International Agricultural Economy</td>
<td></td>
</tr>
<tr>
<td>or A A E/ AGRONOMY/ NUTR SCI 350</td>
<td>World Hunger and Malnutrition</td>
<td></td>
</tr>
</tbody>
</table>

**Total Credits** 29-36

1 Some courses may fulfill GEN ED requirements.

**TURF AND GROUNDS**

**Physical Environment**

Select one of the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATM OCN 100</td>
<td>Weather and Climate</td>
<td>3</td>
</tr>
<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>
<td></td>
</tr>
<tr>
<td>GEOG/ ENVIR ST 120</td>
<td>Introduction to the Earth System</td>
<td></td>
</tr>
<tr>
<td>GEOG/ ENVIR ST 127</td>
<td>Physical Systems of the Environment</td>
<td></td>
</tr>
<tr>
<td>GEOSCI 100</td>
<td>Introductory Geology: How the Earth Works</td>
<td></td>
</tr>
</tbody>
</table>

**Core Turf and Grounds Sciences (complete all)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT IS 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></td>
</tr>
<tr>
<td>M H R 305</td>
<td>Human Resource Management</td>
<td>3</td>
</tr>
<tr>
<td>PL PATH 300</td>
<td>Introduction to Plant Pathology</td>
<td>4</td>
</tr>
<tr>
<td>HORT/SOIL SCI 332</td>
<td>Turfgrass Nutrient and Water Management</td>
<td>3</td>
</tr>
</tbody>
</table>

**Specialized Sciences**

Select 7 credits from the following courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOTANY/F&amp;W ECOL 402</td>
<td>Dendrology</td>
<td></td>
</tr>
<tr>
<td>HORT/ LAND ARC 263</td>
<td>Landscape Plants I</td>
<td></td>
</tr>
<tr>
<td>BSE 243</td>
<td>Operating and Management Principles of Off-Road Vehicles</td>
<td></td>
</tr>
<tr>
<td>BSE 301</td>
<td>Land Information Management</td>
<td></td>
</tr>
<tr>
<td>ENTOM 351</td>
<td>Principles of Economic Entomology</td>
<td></td>
</tr>
<tr>
<td>HORT 120</td>
<td>Survey of Horticulture</td>
<td></td>
</tr>
<tr>
<td>HORT/ PL PATH 262</td>
<td>Turfgrass Management Laboratory</td>
<td></td>
</tr>
</tbody>
</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/current-students/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://www.cals.wisc.edu/academics/undergraduate-programs/get-involved/honors-program/honors-in-the-major/) for more information.

UNIVERSITY DEGREE REQUIREMENTS

Total Degree  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.

Residency  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.

Quality of Work  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.