

# SOIL SCIENCE (SOIL AND WATER SCIENCE) - BACHELOR OF SCIENCE IN AGRICULTURE

Soil scientists investigate the physical, chemical and biological characteristics and behavior of soils, their description and classification, and their management for both agricultural and non-agricultural uses. Career opportunities include: industry jobs; environmental consulting firms; and federal, state and local government careers working on various environmental, agricultural and ecological projects.

The soil and water science concentration is for students interested in careers in water management and water quality. Employment opportunities exist with irrigation districts, consulting firms, and government agencies dealing with water management and quality. The optimum use of water in semi-arid areas is emphasized through selection of courses in the technical and social sciences.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. In addition to the courses listed for each major, you must take 35 credits in the College of Agricultural, Consumer and Environmental Sciences and at least 24 credits of soil science related courses with a grade of C- or above including:

Prefix	Title	Credits
<b>General Education</b>		
<i>Area I: Communications</i>		
<i>English Composition - Level 1</i> <sup>1</sup>		4
<i>English Composition - Level 2</i>		
ENGL 2210G	Professional and Technical Communication Honors	3
<i>Oral Communication</i> <sup>1</sup>		3
<i>Area II: Mathematics</i>		
Choose from one of the following:		3-4
MATH 1430G	Applications of Calculus I <sup>2</sup>	
MATH 1511G	Calculus and Analytic Geometry I <sup>2</sup>	
<i>Area III/IV: Laboratory Science and Social/Behavioral Sciences</i>		11
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
<i>Area IV: Social &amp; Behavioral Sciences Course (3 credits)</i> <sup>1</sup>		
<i>Area V: Humanities</i> <sup>1</sup>		3
<i>Area VI: Creative and Fine Arts</i> <sup>1</sup>		3
<i>General Education Elective</i>		
GEOL 1110G	Physical Geology	4
<b>Viewing A Wider World</b> <sup>3</sup>		6
<b>Departmental/College Requirements</b>		24
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	
SOIL 312 & 312 L	Soil Management and Fertility and Soil Management and Fertility Lab	
SOIL 447	Seminar	

Choose 15 credits of SOIL Courses (300-level or above)		
SOIL 370	Environmental Soil Science	
SOIL 424	Soil Chemistry	
or SOIL 479	Environmental Soil Chemistry	
SOIL 456	Irrigation and Drainage	
SOIL 472	Soil Morphology and Classification	
SOIL 476	Soil Microbiology	
SOIL 476 L	Soil Microbiology Laboratory	
SOIL 477	Environmental Soil Physics	
SOIL 477 L	Environmental Soil Physics Laboratory	
<i>Concentration Coursework</i> <sup>4</sup>		
Select at least one course from each of the following four categories to bring total concentration coursework to 30 credits		30
All course selections must in addition to the courses required under the Departmental/College and Non-Departmental Requirements sections listed above		
<i>Category 1: Crop Production &amp; Protection</i>		
Course category areas are as follows:		
Agronomy		
Entomology		
Plant Pathology		
Weed Science		
Horticulture		
<i>Category 2: Soil &amp; Water Engineering Management</i>		
Course category areas are as follows:		
Agricultural Engineering		
Agricultural Economics		
Civil Engineering		
Environmental Sciences		
Horticulture		
Soil		
<i>Category 3: Ecology</i>		
Course category areas are as follows:		
Biology		
Geography		
Geology		
Range Science		
Soil		
Waste-Management		
Wildlife Science		
<i>Category 4: Advanced Science, Computing &amp; Statistics</i>		
Course category areas are as follows:		
Math		
Chemistry		
Physics		
Computer-Oriented		
Statistics or Applied Statistics		
<b>Non-Departmental Requirements (in addition to Gen.Ed/VWW)</b>		
PHYS 1230G	Algebra-Based Physics I	3
CHEM 2120	Integrated Organic Chemistry and Biochemistry (CHEM 2120 must be taken with associated 1-cr CHEM lab)	3
or ANSC 1170	Introduction to Animal Metabolism	
Choose two from the following (lab is NOT required for this major):		6
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	

BIOL 311	General Microbiology	
<b>Second Language: (not required)</b>		
<b>Electives, to bring the total credits to 120<sup>5</sup></b>		<b>12-14</b>
<b>Total Credits</b>		<b>120</b>

<sup>1</sup> See the General Education (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/>) section of the catalog for a full list of courses

<sup>2</sup> MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites to enter either course first.

<sup>3</sup> See the Viewing a Wider World (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext>) section of the catalog for a full list of courses

<sup>4</sup> Please see your academic advisor for a list of appropriate courses to satisfy the concentration coursework requirements.

<sup>5</sup> Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

## A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1430G Applications of Calculus I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

<b>First Year</b>		
<b>Fall</b>		
		<b>Credits</b>
ENGL 1110G	Composition I	4
ACES 1120	Freshman Orientation (recommended)	1
ACES 1210	Financial Fitness for College Students (recommended)	1
Area V: Humanities Course <sup>5</sup>		3
Choose one from the following: <sup>2</sup>		3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology (Lab not required)	
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution (Lab not required)	
Area VI: Creative and Fine Arts Course <sup>5</sup>		3
<b>Credits</b>		<b>15</b>
<b>Spring</b>		
GEOL 1110G	Physical Geology	4
Concentration Category Course: Category 1, 2, 3, or 4 <sup>4</sup>		4
Oral Communication course		3
Choose one of the following <sup>2</sup>		3-4
MATH 1430G	Applications of Calculus I	
MATH 1511G	Calculus and Analytic Geometry I	
<b>Credits</b>		<b>14-15</b>
<b>Second Year</b>		
<b>Fall</b>		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4

CHEM 1121	General Supplemental Instruction I	1
Viewing a Wider World <sup>6</sup>		3
Concentration Category Course: Categories 1, 2, 3, or 4 <sup>4</sup>		3
Choose one from the following: <sup>2</sup>		3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology (Lab not required)	
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution (Lab not required)	
BIOL 311	General Microbiology (Lab not required)	
Elective Course <sup>1</sup>		2-3
<b>Credits</b>		<b>16-17</b>
<b>Spring</b>		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
CHEM 1122	General Supplemental Instruction II	1
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	4
ENGL 2210G or ENGL 2215G	Professional and Technical Communication Honors or Advanced Technical and Professional Communication	3
Elective Course <sup>1</sup>		3-4
<b>Credits</b>		<b>15-16</b>

### Third Year

<b>Fall</b>		
SOIL 472	Soil Morphology and Classification	4
Viewing a Wider World Course <sup>6</sup>		3
Area IV: Social/Behavioral Sciences Course <sup>5</sup>		3
Concentration Category Course: Category 1, 2, 3, or 4 <sup>4</sup>		3
PHYS 1230G	Algebra-Based Physics I (Lab not required)	3
<b>Credits</b>		<b>16</b>
<b>Spring</b>		
SOIL 456	Irrigation and Drainage	3
SOIL 424	Soil Chemistry	3
Concentration Category Course: Categories 1, 2, 3, or 4 <sup>4</sup>		3
CHEM 2120 or ANSC 1170	Integrated Organic Chemistry and Biochemistry (CHEM 2120 must be taken with associated 1-cr CHEM lab) or Introduction to Animal Metabolism	3-4
Concentration Category Course: Categories 1, 2, 3, or 4 <sup>4</sup>		3
<b>Credits</b>		<b>15-16</b>

### Fourth Year

<b>Fall</b>		
SOIL 477	Environmental Soil Physics	3
Concentration Category Course: Categories 1, 2, 3, or 4 <sup>4</sup>		3
Concentration Category Course: Categories 1, 2, 3, or 4 <sup>4</sup>		3
Concentration Category Course: Categories 1, 2, 3, or 4 <sup>4</sup>		3
Elective		3
<b>Credits</b>		<b>15</b>
<b>Spring</b>		
SOIL 447	Seminar	1
SOIL 312 & 312 L	Soil Management and Fertility and Soil Management and Fertility Lab	4
Concentration Category Course: Categories 1, 2, 3, or 4 <sup>4</sup>		3
Concentration Category Course: Categories 1, 2, 3, or 4 <sup>4</sup>		3

SOIL 476	Soil Microbiology	3
<b>Credits</b>		<b>14</b>
<b>Total Credits</b>		<b>120-124</b>

<sup>1</sup> Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

<sup>2</sup> Students must take two courses from the following, to fulfill degree requirements:

- BIOL 2110G Principles of Biology: Cellular and Molecular Biology
- BIOL 2610G Principles of Biology: Biodiversity, Ecology, and Evolution
- BIOL 311 General Microbiology

<sup>3</sup> The degree requires either MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I, students who do not test into these courses will have additional MATH courses to complete in this semester and where "Elective Courses" are listed in the Roadmap.

<sup>4</sup> Please see your academic advisor for a list of appropriate courses to satisfy the concentration coursework requirements.

<sup>5</sup> See the General Education (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/>) section of the catalog for a full list of courses

<sup>6</sup> See the Viewing a Wider World (<https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext>) section of the catalog for a full list of courses