Rangeland Resource Science

Bachelor of Science degree  
with a major in Rangeland Resource Science

Bachelor of Science degree  
with a major in Rangeland Resource Science — concentration in Wildland Soil Science

Minor in Rangeland Resource Science

Minor in Wildland Soil Science

See Natural Resources for information on the Master of Science degree.

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The Program  
Students completing this program will be able to:

- Identify plants and quantify vegetation attributes
- Describe, classify and evaluate soil resource attributes
- Evaluate rangeland health using national standards
- Communicate effectively, using oral and written means, the factual basis, interconnectedness, and interpretation of rangeland/wildland soil science and management
- Demonstrate reasoning and critical thinking skills in solving scientific and resource management problems

Rangeland Resource Science. Learn to manage rangeland ecosystems wisely. Study forage, timber, wildlife, recreation, watersheds, and their interrelationships.

Classroom instruction is enhanced by the university’s soil science laboratories and greenhouses. Research and demonstration sites on private and public lands in Northern California enhance field studies.

Potential careers: soil conservationist, soil scientist, soil consultant, environmental specialist, agricultural inspector, lands or natural resources specialist, restoration specialist, or watershed manager.

The Wildland Soil Science Concentration meets the qualifications for “Soil Conservationist” position classifications in federal employment. This concentration also meets the educational requirements to take the California Certified Rangeland Manager examination.

Wildland Soil Science Concentration. Learn to address the unique management requirements and problems of wildland soils. Wildland soils are uncultivated, natural soils supporting herbaceous and woody plant communities supplying timber, wildlife habitat, livestock forage, watershed values, and other ecosystem services.

Courses in this concentration cover the basic physical and biological sciences, introductory and advanced soil science, and soil and natural resource management.

Classroom instruction is enhanced by the university’s soil science laboratories and greenhouses. Research and demonstration sites on private and public lands in Northern California enhance field studies.

Potential careers: soil conservationist, soil scientist, soil consultant, environmental specialist, agricultural inspector, lands or natural resources specialist, restoration specialist, or watershed manager.

The Wildland Soil Science Concentration meets the qualifications for “Soil Conservationist” position classifications in federal employment. This concentration also meets the educational requirements to take the Fundamentals of Soil Science Examination.

Preparation  
In high school take courses in biology, chemistry, mathematics, and earth sciences.

REQUIREMENTS FOR THE MAJOR

For a description of degree requirements to be fulfilled in addition to those listed below for the major, please see “The Bachelor’s Degree” section of the catalog, pp. 67-82., and “The Master’s Degree” section of the catalog, pp. 83-84.

Complete all courses in the major with a C or better.

Core Courses

Lower Division

BIOL 105 (4) Principles of Biology
BOT 105 (4) General Botany
CHEM 107 (4) Fundamentals of Chemistry
ESM 105 (3) Natural Resource Conservation
GSP 101/GSP 101L (2/1) Geospatial Concepts and Lab
GSP 216 (3) Introduction to Remote Sensing, or
GSP 270 (3) Geographic Information Science (GIS)
PHYX 106 (4) College Physics: Mechanics & Heat
SCI 100 (3) Becoming a STEM Professional in the 21st Century
SOIL 260 (3) Intro to Soil Science
STAT 109 (4) Introductory Biostatistics

Upper Division

BOT 310 (4) General Plant Physiology
BOT 350 (4) Plant Taxonomy
ESM 305 (3) Environmental Conflict Resolution
FOR 315 (3) Forest Management
FOR 359 (3) CA & US Forest & Wildland Policy
RRS 306 (3) Wildland Resource Principles
RRS 360 (3) Wildland Plant Communities
RRS 370 (3) Wildland Ecology Principles
RRS 375 (3) Vegetation Analysis & Health
SOIL 360 (3) Origin & Classification of Soils
SOIL 460 (3) Wildland Soil Management & Erosion Control
WSHD 310 (4) Hydrology & Watershed Management

Select one of the following concentrations (Rangeland Resource Science or Wildland Soil Science) and an associated emphasis.

Rangeland Resource Science

Core courses plus:

ESM 215 (3) Natural Resources & Recreation, or
FOR 321 (3) Fire Ecology [required for Fire Emphasis], or
WLDF 301 (3) Principles of Wildlife Management

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Approved Electives

Complete one of the following emphases for the Rangeland Resource Science concentration (5-7 units), or any combination of the courses below or advisor-approved electives totaling a minimum of 6 units.

**Botany Emphasis** (6 units)
Take a minimum of 6 units selected from:
- BOT 355 [4] Lichens & Bryophytes
- BOT 360 [2] Biology of the Fleshy Fungi

**Ecological Restoration Emphasis** (7 units)

**Geospatial Technology Emphasis** (6 units)
- Take 6 units of advisor-approved GSP courses (not already taken in core requirements)

**Fire Emphasis** (5 units)
- FOR 223 [2] Introduction to Wildland Fire
  and one of the following:

**Natural Resource Policy Emphasis** (6 units)
- ESM 325 [3] Environmental Law & Regulation

**Soil Emphasis** (6 units)
- Take two of the following courses.
  - SOIL 462 [3] Soil Fertility

**Wildland Soil Science Concentration**
Soil courses are embedded in this concentration to meet federal “Soil Scientist” requirements.

In addition to core courses, complete one of the following emphases for the Wildland Soil Science Concentration or any combination of the courses below or advisor-approved electives totaling a minimum of 18 additional units.

**Botany Emphasis** (18 units)
Take minimum of 6 units from:
- BOT 355 [4] Lichens & Bryophytes
- BOT 360 [2] Biology of the Fleshy Fungi

Take 12 units from the following:
- FOR 130 [3] Dendrology
- SOIL 462 [3] Soil Fertility
- SOIL 468 [3] Intro to Agroforestry

**Earth Sciences Emphasis** (19-20 units)

Take one additional GSP course not taken in the core (3-4 units)

Take 6 units from the following:
- SOIL 462 [3] Soil Fertility

**Ecological Restoration Emphasis** (19 units)

Take two of the following courses:
- SOIL 462 [3] Soil Fertility
- SOIL 468 [3] Intro to Agroforestry

**Sustainable Agriculture Emphasis** (16 units)
Take three of the following:
- SOIL 462 [3] Soil Fertility
- SOIL 468 [3] Intro to Agroforestry

Take one of the following:
- PSCI 373 [4] Politics of Sustainability

**Rangeland Resource Science Minor**
- SOIL 260 [3] Intro to Soil Science
- RRS 375 [3] Vegetation Analysis & Health

**Wildland Soil Science Minor**
- SOIL 260 [3] Intro to Soil Science

At least three courses (including one or more with plus signs *) from the following:
- SOIL 462 [3] Soil Fertility
- SOIL 465 [3] Soil Microbiology*
- SOIL 467 [3] Soil Physics*
- SOIL 468 [3] Intro to Agroforestry

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**REQUIREMENTS FOR THE MINORS**

**Rangeland Resource Science Minor**
- SOIL 260 [3] Intro to Soil Science
- RRS 375 [3] Vegetation Analysis & Health

**Wildland Soil Science Minor**
- SOIL 260 [3] Intro to Soil Science

At least three courses (including one or more with plus signs *) from the following:
- SOIL 462 [3] Soil Fertility
- SOIL 465 [3] Soil Microbiology*
- SOIL 467 [3] Soil Physics*
- SOIL 468 [3] Intro to Agroforestry