

Special Opportunities

A regional center for development of the wood products industry, the Appalachian Hardwood Center, is allied with the wood science and technology program. The center's staff frequently provides opportunities for educational and professional development of wood science and technology students. Students sometimes find part-time employment in the research program of the center as well as with the faculty's teaching and research program.

Career Prospects

The wood products industry employs an estimated 1.6 million people nationwide. Yet only 22 American universities provide programs specifically designed to educate professionals to manage and provide technical expertise to the industry. West Virginia University is one of them. The unique nature of the program and the large base of potential employers result in an excellent job market for wood science and technology graduates. Career opportunities are quite diverse. The jobs span the spectrum from standing timber through manufacture of products to their marketing, distribution, and end use. Graduates may work in sawmills as production managers or as timber procurement foresters, buying timber, and planning harvesting operations in accordance with sound forest management and environmental practices. They may also gain employment as quality assurance managers, production supervisors, and process engineers for companies that manufacture furniture, cabinets, and state-of-the-art engineered wood products. Graduates may become product designers and estimators or they may purchase and sell materials and services. Some of our graduates go on to graduate school in wood science or related disciplines, including forestry, business administration, and engineering. They work in all parts of the nation and in both rural and urban communities, yet approximately half find employment in West Virginia. Many of the leaders in the nation's wood products industry are WVU graduates.

Minor in Wood Science and Technology

Requirements include 18 credit hours, including WDSC 223, 340, and 341 (9 hours); and a minimum of nine hours selected from 232, 413, 422, 423, 330, 337, 351, 362, or 465.

Division of Plant and Soil Sciences

Barton S. Baker, Ph.D., Director

Nature of Program, Objectives, and Goals

Students in the Division of Plant and Soil Sciences may choose from agroecology, agronomy (including a turf emphasis), applied and environmental microbiology, horticulture, environmental protection, or soil science majors. Graduates from these curricula are employed in commercial industries involved with the production and distribution of pesticides, fertilizers, seeds and plants, and nursery, floral, and turf products. Positions as estate and farm managers, land reclamationists, city and county planning technicians, park and golf course superintendents, and environmental protectionists are also available to graduates. A variety of state and federal governmental and private consulting positions are available as well. Graduates who wish to further their education may acquire the necessary backgrounds to enter professional or graduate programs in such fields as agricultural biochemistry, crop science, entomology, genetics, horticulture, microbiology, mycology, plant pathology, plant physiology, and soil science.

Bachelor of Science in Agriculture

Curriculum Requirements: Plant and Soil Sciences

General Education Curriculum

	Hrs.
Objectives 1 and 3–9	28–29
Objective 2 (including a minimum of eight hours in biology;	24
eight hours in chemistry; three hours in college algebra or equivalent).	
Courses in agriculture.....	45

- Elect a minimum of a three credit course, excluding Assigned topics, from each of the following disciplines
1. Animal science
 2. Plant science
 3. Soil science
 4. Agricultural/resource economics

Elect additional courses to obtain a total of 45 hours in Agriculture

Free and Restrictive Electives	31–32
Total	128

Specific requirements of reach of the program options are listed under the description of that option.

Agroecology

Agroecology is the interdisciplinary study of how agricultural production of plants and animals affects and is affected by the local environment. Agroecology emphasizes sustainable and environmentally friendly approaches to agricultural production. The agroecology major combines concepts of crop production with those of environmental protection in such a way that there is a sustained balance between production and environmental issues. This major provides students the opportunity to specialize in ecological/sustainable aspects of crop production. Potential areas of employment include: farm and environmental consulting, organic farms, parks, lawn care and maintenance companies, agricultural supply companies, cooperative extension, and state and federal government support agencies.

Required Courses Students in the agroecology major must complete all requirements for the minor in soil science and must complete any two additional minors offered through the Division of Plant and Soil Sciences. Those minors include environmental microbiology, environmental protection, horticulture, and pest management. Other required courses include: AGRL 111; AGRN 202, 203; AGRN/ENVP 425; A&VS 251; CHEM 111, 112; ENVM 341; ENTO 404; GEN 371; MATH 126; PPTH 401; PLSC 206; PLSC 453; STAT 211; plus a capstone course from one of the minors other than soil science.

Agronomy

Agronomy is the application of science to field crop production or turf management. The crop science option in agronomy emphasizes primarily the physiology, production, and quality of forage crops. The turf emphasis allows students to take courses in turfgrass management, weed science, and soil fertility. The turf emphasis also requires an internship in turfgrass management. Agronomists qualify for a wide variety of occupations, including farming, soil conservation, agricultural sales, extension, research, and turfgrass management.

Required Courses AGRN 452; BIOL 350; CHEM 115, 116; ENGL 305; ENTO 404; ENVM 341; GEN 371; MATH 128 or equivalent; PHYS 101; PPTH 401; STAT 211; three hours in computer science; three hours in communication studies or speech pathology and audiology; one semester of organic chemistry including laboratory; six hours in ECON or ARE; seven hours in soil science; 15 hours in crop science.

Additional Requirements for the Turf Emphasis AGRN 315; AGRN 451; AGRN 410; AGRL 491.

Environmental Protection

This option prepares students for careers in areas which safeguard the quality of the environment. The curriculum consists of two elements: interdisciplinary training in a broad array of environmental protection sciences, and a specialization in either pest management or soil and water conservation. Students work with their advisor to select courses from both the environmental protection electives and the specialization electives that match their individual interests and career goals. Recent graduates in this option are employed by municipal, state, and federal governmental agencies; consulting firms, especially those specializing in land reclamation, water quality, or pest management; and companies associated with natural resource industries.

Math and Science Requirements CHEM 115, 116, 231; MATH 126; STAT 211; GEOL 101, 102 or 110, 111*.

Required College Courses AGRL 111, ARE Course; AGRN 202, 203; A&VS 251, ENVM 341; ENVP 155, 460; PLSC 206; choose two of the following courses: GEN 371, ENTO 404, PPTH 401.

Environmental Protection Electives (15 hours from at least two areas) AGBI 410; ARE 220, 383, 410; BIOL 361; CE 443; CS 101*; or AGEE 110; ENVP 355; FOR 210, 326; GEN 371; GEOG, 205, 305, 350; PHYS 101, 102; POLS 355.

Pest Management Specialization Capstone ENVP/ENTO 412 plus 14 hours from the following: AGRN 315, AGRN/ENVP 451; BIOL 221; ENTO/PPTH 470; ENTO 404, 410; ENVM 401; PPTH 401.

Soil and Water Conservation Specialization Capstone ENVP/AGRN 425 plus 15 hours from the following: ENVP/AGRN 455; AGEE 460, 461; AGRN 410, 415, 417, 430, 451, 454, 455; BIOL 362; CE 347, 441; ENVM 401; ENVM/AGRN 420; FHYD 444; FMAN 251; GEOL 321, 365, 463; WMAN, 350.

***Note:** The B.S. in agriculture requires 45 hours in agriculture courses. The total hours may be met by taking the required college courses and by taking college courses offered under environmental protection electives, free electives, or one of the specializations. STAT 211; GEOL 101 and 102, or 110 and 111; and CS 101 are accepted as part of the required 45 hours in agriculture courses.

Horticulture

Horticulture is the science of production, processing, and marketing of fruit, vegetable, greenhouse, and landscape crops. Students in the horticulture option study the physiology, culture, harvesting, quality control, sales, and utilization of horticultural crops. Horticulture prepares students for careers such as orchard, vegetable farm, or greenhouse managers, landscape contractors, golf course and park horticulturists, seed and supply company representatives, state and federal nursery inspectors, and educators in schools and extension. Students will choose an area of emphasis in landscape management or in production depending on their career goals.

Required Courses A&VS 251; AGRN 202, 203; AGRN 410; ARE course; CHEM 111, 112; BIOL 350; CS 101; ENTO 404; GEN 371 or ENVM 341; HORT 220, 420, 441, 445, 491 or 493; MATH 126; PLSC 206; PPTH 401.

Landscape Management Area of Emphasis LARC 105; HORT 260; HORT 493; and two courses from the following: AGEE 452, AGRN 315, AGRN 451, ARE 204, BIOL 361, ENTO 412, CE 200, HORT 262.

Production Area of Emphasis AGRN 451; HORT 444; HORT 493; and two courses from the following: AGEE 452, AGRN 315, ARE 204, BIOL 352, ENTO 412, HORT 230, HORT 260, PLSC 453.

Bachelor of Science

Applied and Environmental Microbiology

The major in applied and environmental microbiology is ideal for students desiring a career at the forefront of human and plant health, industry, food science, and the environment. In this curriculum, future professional microbiologists are prepared with basic backgrounds in the areas of microbial ecology, environmental microbiology, soil microbiology, public health microbiology of food and water, plant pathology, and molecular biology. With supporting coursework in such areas as organic chemistry, biochemistry, genetics, plant science, soil science, physics, calculus, and statistics students will be well prepared for employment, further educational training at the graduate level, or for professional school (medical and dental school). Employment opportunities include: environmental laboratories (federal, state, and private); pharmaceutical industry; food industry (food production and food safety); and clinical laboratories in the health care industry. This major requires 128 total hours.

Basic Math and Science Requirements (14 hours) CHEM 115, 116; MATH 150; STAT 211.

Required Courses for Major (43 hours) CHEM 233, 234, 235, 236; AGBI 410; PHYS 101, 102; AGRN 202, 203; PLSC 206; GEN 371; PPTH 401; ENVM 341, 401 (Capstone)

Restricted Electives for Major: (minimum of 18 hours) AGBI 514; BIOL 312; ENVM 408, 420, 445, 449, 495; ENVP 355, 460; PPTH 409, 470, 503.

Soil Science

The focus of the soil science major is the wise use and management of land and soil resources. This major is ideal for those students interested in soil and water conservation, soil and water quality, mined land reclamation, use of soils for construction sites, waste water treatment and wetland preservation. Students will be prepared for positions in soil survey, soil and water conservation, wetland delineation, and environmental management with the federal or state governments, private industries, private consulting, or cooperative extension. This major also prepares students for graduate programs in earth science, environmental science, or soil science. This major requires 128 total hours. Students will choose an area of emphasis in land use or in watershed management depending on their career goals.

Basic Math and Science Requirements CHEM 115, 116, 231; GEOL 110, 111; MATH 150; STAT 211.

Required Courses for Major AGRL 111, AGRN 202, 203; AGEE 110 or CS 101; AGEE 220; ECON 201; ENVM 341; ENVP 155; PLSC 206; PHYS 101, 102; SPA 170, 270; and two of the following courses: ENTO 404, GEN 371, PPTH 401.

Restricted Electives for Major (minimum of 15 hours) AGRN 125, 410, 415, 417, 420, 430, 455.

Land Use Area of Emphasis (minimum of 12 hours) AGRN 425 (Capstone); CE 200, 351, 441; GEOL 201, 321; RESM 493.

Watershed Management Area of Emphasis (minimum of 12 hours) AGRN 425 (Capstone); BIOL 361; CE 347; ENVP 355, 460; GEOL 321; 463; WMAN 446.

Minor in Environmental Protection

The minor in environmental protection is designed to provide students the opportunity to study, through a set of selected courses, ways to safeguard the environment with emphasis on water, soil, and crop protection. Emphasis is given to the relationships among a wide range of science-based disciplines and how they collectively are applied to environmental protection. This minor requires 15 hours of required and restricted electives with a minimum letter grade of C in each course. Required courses are ENVP 155 and ENVP 460.

An additional nine hours must be selected from the following courses: ENVP 355, ENVM/ENVP 401, ENTO/ENVP 412, AGRN/ENVP 425, AGRN/ENVP 451, AGRN/ENVP 455.

Minor in Horticulture

The minor in horticulture is designed to provide students educational opportunities in the area of ornamental horticulture as it relates to current urban environments. Emphasis is given to the establishment and management of herbaceous and woody plants used in commercial, recreational, and home settings. This minor requires a minimum 16 hours in horticulture related courses with a grade of C or higher in each course. Required courses are PLSC 206 and HORT 220. A minimum of nine additional hours must be chosen from the following courses: HORT 420, HORT 441, HORT 444, and HORT 445.

Minor in Pest Management

The minor in pest management is designed to introduce students to various insects, plant pathogens, and weeds as pests that attack and compete with agriculture crops, ornamentals, and forest trees. Emphasis is placed on environmentally sound management system based on cultural, biological, and chemical strategies. Relationships among pests, crops, and the environment are critical in this minor. The minor requires 15 hours of pest management related courses with a grade of C or better in each course. Required courses are ENTO/ENVP 412 and PPTH 401. An additional seven hours must be selected from the following courses with no more than four hours being special topics. AGRN/ENVP 451, ENTO 410, ENTO/PPTH 470, ENTO 493, PPTH 493.

Minor in Soil Science

The minor in soil science is designed to introduce students to the relationship of soils to environmental protection and agriculture production. This minor broadens and strengthens non-soils curricula where students are interested in the relationships among biological and earth science in an environmental setting. The soil science minor requires a minimum of 15 hours of soil science courses with a grade of C or better in each course. Required courses are AGRN 202, AGRN 203, and AGRN/ENVP 425. An additional eight hours must be selected from the following courses: AGRN 125, AGRN 410, AGRN 415, AGRN 417, AGRN/ENVM/ENVP 420, AGRN 430, AGRN/ENVP 455.

Minor in Environmental Microbiology

The minor in environmental microbiology is designed to introduce students to the beneficial and harmful roles of microorganisms in a variety of diverse environments including plants, animals, soil, food, air, and water. Emphasis is given to the importance of microorganisms in such applied areas as public health, plant disease, pollution and pollution abatement, biological control of pests, biodeterioration, and ecology.

Total number of required hours: 15 hours with a minimum letter grade of C in each course and a cumulative GPA of at least 2.5. Required courses: ENVM 341 *General Microbiology* (4 hr.), and PPTH 401 *General Plant Pathology* (4 hr.).

Minimum of seven hours selected from the following: ENVM 401 *Environmental Microbiology* (4 hr.) ENVM 420 *Soil Microbiology* (3 hr.), ENVM 493 *Special Topics in Environmental Microbiology* (*1-4 hr.), PPTH 470 *Forest Pest Management* (3 hr.), PPTH 493 *Special Topics in Plant Pathology* (*1-4 hr.), PPTH 503 *Mycology* (4-hr.), PPTH 409 *Nematology* (3 hr.).

*Maximum of four hours of special topics courses (ENVM 493 or PPTH 493) can be applied toward the 15 hour total and requires approval of the division director.

Division of Resource Management

Timothy T. Phipps, Ph.D., Interim Director

Programs

The Division of Resource Management offers curricula in agricultural and extension education, landscape architecture, and agricultural and resource economics. The curriculum in agricultural and resource economics allows emphasis in environmental and resource economics, or agribusiness management and rural development. Students are prepared to pursue graduate studies or work in agriculture, business, industry, government, finance, and related areas or to pursue graduate studies. The curriculum in agricultural and extension education prepares students to teach agriculture in secondary schools, enter the extension service, or accept professional employment in government, industry, or entrepreneurship. An agricultural and extension education major can also elect to specialize in environmental technology with employment opportunities available in related activities after graduation. The landscape architecture curriculum prepares students for professional careers with private firms and government agencies.

Agribusiness Management and Rural Development Major Bachelor of Science

The goal of this major is to provide students with a breadth of knowledge in both the social and natural sciences upon which further professional training can be based. After graduation, students will be prepared for employment in private and public sectors of agriculture and rural development. Students with this major can expect to find employment in: agribusiness firms or farms; rural economic development agencies; financial institutions; or state and federal government agencies dealing with agriculture or natural resource management. Employment in these areas requires the essential components of this major: a broad educational background combined with knowledge of agricultural and rural economies. This major provides students with the flexibility to pursue coursework in preparation for graduate school.