School of Natural Resources

Programs of Study

The School of Natural Resources is home to programs in Agribusiness Management and Rural Development; Energy Land Management; Environmental and Energy Resources Management; Environmental and Natural Resources Economics; Forest Resources Management; Recreation, Parks, and Tourism Resources; Wildlife and Fisheries Resources; and Wood Science and Technology. As a student in this school you may pursue a degree that enables you to begin a career in agribusiness management, natural resources management, land management, the forest products industry, environmental and resource economics, outdoor recreation, fisheries or wildlife biology. Students are also well-prepared for graduate study in these or allied fields.

Courses that you will take in the School depend on a student’s particular program. A primary mission of the School of Natural Resources is to further the understanding, stewardship, and sustainable use of renewable natural resources by educating students to become knowledgeable professionals and citizens, advancing and communicating research knowledge, and providing technical information and professional service to society. Students completing a Bachelor of Science degree in the School of Natural Resources fulfill broad general education foundation requirements, Bachelor of Science degree requirements, and a study of at least one discipline in depth. The School of Natural Resources strives to spark a passion in our students for the principles of stewardship and sustainability of our renewable natural resources by:

- offering students the education to assume leadership roles
- advancing research knowledge
- providing technical information and professional service to society

Accreditation

The B.S.F. in Forest Resources Management and B.S. in Recreation, Parks, and Tourism Resources are accredited by the Society of American Foresters. The Wildlife and Fisheries Resources curriculum requires the coursework needed for professional certification by The American Fisheries Society (Fisheries emphasis) or The Wildlife Society (Wildlife emphasis) under 2014 guidelines. The Wood Science and Technology program is accredited by the Society of Wood Science and Technology. The Energy Land Management program is one of ten programs in North America accredited by the American Association of Professional Landmen.

FACULTY

DIVISION DIRECTORS
- Joseph F. McNeel (Director) - Ph.D. (Virginia Polytechnic University)
- Gerard E. D'Souza (Associate Director) - Ph.D. (Mississippi State University)
  Agricultural and Resource Economics

PROFESSORS
- James T. Anderson - Ph.D. (Texas Tech University)
  Wildlife ecology and management
- Robert C. Burns - Ph.D. (The Pennsylvania University)
  Understanding recreational behavior, motivations, and satisfaction levels
- Alan R. Collins - Ph.D. (Oregon State University)
  Resource economics
- Ben Dawson-Andoh - Ph.D. (University of British Columbia)
  Wood microbiology and chemistry
- Gerard E. D'Souza - Ph.D. (Mississippi State University)
  Production economics, Finance
- John W. Edwards - Ph.D. (Clemson University)
  Wildlife ecology and management
- Jerald J. Fletcher - Ph.D. (University of California, Davis)
  Energy, environmental and resource economics
- Tesfa Gebremedhin - Ph.D. (Oklahoma State University)
  Farm management, Agribusiness
- Kyle J. Hartman - Ph.D. (University of Maryland)
  Aquatic ecology, Fish management
- David W. McGill - Ph.D. (The Pennsylvania State University)
  Woodland owner outreach, forest regeneration
School of Natural Resources

- Joseph F. McNeel - Ph.D. (Virginia Tech)
  Forest harvest and operations
- J. Todd Petty - Ph.D. (University of Georgia)
  Stream and river ecology, watershed assessment and restoration
- Tim T. Phipps - Ph.D. (University of California, Davis)
  Resource economics, Agricultural policy
- Peter V. Schaeffer - Ph.D. (University of Southern California)
  Regional science, Applied microeconomics
- Steven Selin - Ph.D. (University of Oregon)
  Human dimensions and Natural resources management
- Kaushlendra Singh - Ph.D. (University of Georgia)
  Thermo-chemical Conversion
- Dennis K. Smith - Ph.D. (Pennsylvania State University)
  Rural development, Agribusiness management
- Jingxin Wang - Ph.D. (University of Georgia)
  Biomass logistics, utilization and bioenergy, forest BMPs

ASSOCIATE PROFESSORS

- Cheryl Brown - Ph.D. (University of California, Berekely)
  Agricultural and food policy and economics, Agribusiness
- Jinyang Deng - Ph.D. (University of Alberta)
  Ecotourism
- Kathryn Arano Gazal - Ph.D. (Mississippi State University)
  Forest economics and policy
- Fonda Holehouse - J.D. (West Virginia University)
  Environmental and enterprise development and law
- Donald J. Lacombe - Ph.D. (Florida State University)
  Spatial econometrics, Public choice and industrial organization
- Chad D. Pierskalla - Ph.D. (University of Minnesota)
  Public resource land management and agricultural tourism
- Dave Smaldone - Ph.D. (University of Idaho)
  Environmental and Cultural Interpretation, Nature-based tourism
- Mark Sperow - Ph.D. (Colorado State University)
  Production and resource economics
- Ben D. Spong - Ph.D. (Oregon State University)
  Forest operations, roads, and harvesting
- Michael P. Strager - Ph.D. (West Virginia University)
  Spatial analysis, Decision support

ASSISTANT PROFESSORS

- Gregory A. Dahle - Ph.D. (Rutgers University)
  Tree biomechanics and urban forestry
- David B. DeVallance - Ph.D. (Oregon State University)
  Renewable materials manufacturing and biofuel evaluation
- Jingjing Liang - Ph.D. (University of Wisconsin-Madison)
  Forest ecology.
- Kudzayi Maumbe - Ph.D. (Michigan State University)
  Tourism
- Stuart Moss - Ph.D. (West Virginia University)
  Management of private forests
- Gloria Oporto - Ph.D. (University of Maine)
  Biomaterials
- James S. Rentch - Ph.D. (West Virginia University)
  Forest ecology
- Jamie Schuler - Ph.D. (North Carolina State University)
  Forest regeneration and restoration
- Doolarie Singh-Knights - Ph.D. (West Virginia University)
Natural resource economics
- Amy Welsh - Ph.D. (University of California – Davis)
  Conservation genetics of fish and wildlife populations; wildlife forensics
- Nicolas P. Zegre - Ph.D. (Oregon State University)
  Watershed and forest hydrology
- Mo Zhou - Ph.D. (University of Wisconsin – Madison)
  Forestry and carbon credits, natural resources policy

ADJUNCT PROFESSORS
- Shawn Grushecky - Ph.D. (West Virginia University)
  Appalachian Hardwood Center, Energy land management
- Patricia M. Mazik - Ph.D. (Memphis State University)
  Aquatic toxicology, fish physiology
- Sheldon Owen - Ph.D. (West Virginia University)
  Extension wildlife specialist
- Stuart A. Welsh - Ph.D. (West Virginia University)
  Ichthyology
- Petra B. Wood - Ph.D. (University of Florida)
  Avian ecology

In this section:
- Arboriculture (p. 3)
- Agribusiness Management (p. 4)
- Conservation Ecology (p. 4)
- Environmental Economics (p. 4)
- Forestry Resources Management (p. 5)
- Recreation, Parks, and Tourism Resources (p. 5)
- Sustainable Low-Rise Residential Construction (p. 5)
- Wildlife and Fisheries Resources (p. 6)
- Wood Science and Technology (p. 6)

ARBORICULTURE
MINOR CODE- U073
The minor in arboriculture 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.

A minimum GPA of 2.0 is required in all minor courses

<table>
<thead>
<tr>
<th>Minor Requirements</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRN 410</td>
<td>Soil Fertility</td>
<td>3</td>
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<tr>
<td>FOR 205</td>
<td>Dendrology</td>
<td>3</td>
</tr>
<tr>
<td>Select one of the following:</td>
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<td>3</td>
</tr>
<tr>
<td>HORT 260</td>
<td>Woody Plant Materials</td>
<td></td>
</tr>
<tr>
<td>LARC 260</td>
<td>Ornamental Woody Plants and Groundcovers</td>
<td></td>
</tr>
<tr>
<td>Select 9 hours from the following:</td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>ENTO 404 &amp; PPTH 401</td>
<td>Principles of Entomology and General Plant Pathology</td>
<td></td>
</tr>
<tr>
<td>ENTO 470</td>
<td>Forest Pest Management</td>
<td></td>
</tr>
<tr>
<td>ENTO 471</td>
<td>Urban Tree and Shrub Health</td>
<td></td>
</tr>
<tr>
<td>FMAN 315</td>
<td>Survey of Arboriculture</td>
<td></td>
</tr>
<tr>
<td>FMAN 491</td>
<td>Professional Field Experience</td>
<td></td>
</tr>
<tr>
<td>PLSC 491</td>
<td>Professional Field Experience</td>
<td></td>
</tr>
<tr>
<td>PPTH 470</td>
<td>Forest Pest Management</td>
<td></td>
</tr>
<tr>
<td>PPTH 471</td>
<td>Urban Tree and Shrub Health</td>
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</table>
Select two of the following electives:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>AGRN 315</td>
<td>Turfgrass Management</td>
</tr>
<tr>
<td>FMAN 440</td>
<td>Forestry Consulting</td>
</tr>
<tr>
<td>HORT 262</td>
<td>Herbaceous Plant Materials</td>
</tr>
<tr>
<td>HORT 441</td>
<td>Garden Center Management</td>
</tr>
</tbody>
</table>

Total Hours 24

* Must be related to an arboriculture topic and must be approved in advance by the director of the Division of Plant and Soil Sciences or the director of the Division of Forestry and Natural Resources.

**AGRIBUSINESS MANAGEMENT**

**MINOR CODE - U047**

Principles pertaining to agribusiness management.

A minimum GPA of 2.0 is required in all minor courses.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARE 110</td>
<td>Agribusiness Accounting</td>
</tr>
<tr>
<td>ARE 204</td>
<td>Agribusiness Management</td>
</tr>
<tr>
<td>ARE 461</td>
<td>Agribusiness Finance</td>
</tr>
</tbody>
</table>

Select one of the following: 3

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARE 431</td>
<td>Marketing Agricultural Products</td>
</tr>
<tr>
<td>ARE 435</td>
<td>Marketing Livestock Products</td>
</tr>
</tbody>
</table>

Select one of the following: 3-4

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARE 382</td>
<td>Agricultural and Natural Resources Law</td>
</tr>
<tr>
<td>ARE 406</td>
<td>Applied Quantitative Methods</td>
</tr>
<tr>
<td>ARE 421</td>
<td>Rural Enterprise Development</td>
</tr>
<tr>
<td>ARE 440</td>
<td>Futures Markets and Commodity Prices</td>
</tr>
</tbody>
</table>

Total Hours 15-16

**CONSERVATION ECOLOGY**

**MINOR CODE - U071**

This minor is designed to provide students specialized knowledge and skills in the area of conservation ecology. Completion of this minor allows new career opportunities, enhances lifelong learning, and promotes the role of an informed and active citizen.

**Minor Requirements**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>WMAN 150</td>
<td>Principles of Conservation Ecology</td>
</tr>
<tr>
<td>WMAN 200</td>
<td>Restoration Ecology</td>
</tr>
<tr>
<td>WMAN 313</td>
<td>Wildlife Ecosystem Ecology</td>
</tr>
<tr>
<td>WMAN 421</td>
<td>Renewable Resources Policy and Governance</td>
</tr>
</tbody>
</table>

Select one of the Following: 3-4

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEN 371</td>
<td>Principles of Genetics</td>
</tr>
<tr>
<td>WMAN 330</td>
<td>Conservation Genetics</td>
</tr>
</tbody>
</table>

Total Hours 16-17

**ENVIRONMENTAL ECONOMICS**

**MINOR CODE - U053**

Fifteen hours and a GPA of at least 2.0 in courses counted toward the minor.

**Environmental Problems of Issues (select one of the following):** 3

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>ARE 187</td>
<td>Energy Resource Economics</td>
</tr>
<tr>
<td>ENVP 155</td>
<td>Elements of Environmental Protection</td>
</tr>
<tr>
<td>FOR 140</td>
<td>West Virginia's Natural Resources</td>
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</tbody>
</table>

**Environmental and Resource Economics** 9

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARE 220</td>
<td>Introductory Environmental and Resource Economics</td>
</tr>
</tbody>
</table>
FORESTRY RESOURCES MANAGEMENT

MINOR CODE - U090

The minor in Forestry Resources Management is designed to provide students educational opportunities in the area of forest resources management. Emphasis is given to those courses that provide a specific skill set or knowledge base needed to understand sustainable forest management in the Appalachian region. This minor requires a grade of C or higher in each course.

A grade of C or higher must be earned in all courses.

**Minor Requirements**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMAN 212</td>
<td>Forest Ecology</td>
<td>3</td>
</tr>
<tr>
<td>FMAN 222</td>
<td>Forest Mensuration</td>
<td>4</td>
</tr>
<tr>
<td>FMAN 311</td>
<td>Silvicultural Systems</td>
<td>4</td>
</tr>
<tr>
<td>FOR 205</td>
<td>Dendrology</td>
<td>3</td>
</tr>
<tr>
<td>FMAN 330</td>
<td>Principles of Forestry Economics</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Select one of the following:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FMAN 433</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>FHYD 444</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FOR 440</td>
<td></td>
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<tr>
<td></td>
<td>FOR 326</td>
<td></td>
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<tr>
<td></td>
<td>FOR 421</td>
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<tr>
<td></td>
<td>WDSC 422</td>
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<tr>
<td></td>
<td>WDSC 423</td>
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</tbody>
</table>

**Total Hours**

21

RECREATION, PARKS, AND TOURISM RESOURCES

MINOR CODE - U085

The minor in Recreation, Parks, and Tourism Resources is designed to provide students with specialized knowledge and skills that may open the door to new career opportunities, enhance lifelong learning, and promote their role as an informed and active citizen. The minor emphasizes the ecological, economic, and social psychological aspects of managing outdoor recreation and tourism resources. A grade of "C" or higher must be earned in all courses counted toward the minor.

**Minor Requirements**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPTR 142</td>
<td>Introduction to Recreation, Parks and Tourism</td>
<td>2</td>
</tr>
<tr>
<td>RPTR 239</td>
<td>Sustainable Tourism Development</td>
<td>3</td>
</tr>
<tr>
<td>RPTR 242</td>
<td>Environmental and Cultural Interpretation</td>
<td>3</td>
</tr>
<tr>
<td>RPTR 365</td>
<td>Planning and Design in Recreation, Parks and Tourism</td>
<td>3</td>
</tr>
<tr>
<td>FOR 438</td>
<td>Human Dimensions Natural Resource Management</td>
<td>3</td>
</tr>
<tr>
<td>or RPTR 491</td>
<td>Professional Field Experience</td>
<td></td>
</tr>
<tr>
<td>RPTR 335</td>
<td>Management in Recreation, Parks and Tourism Organizations</td>
<td>3</td>
</tr>
<tr>
<td>or RPTR 433</td>
<td>Recreation Resource Management</td>
<td></td>
</tr>
</tbody>
</table>

**Total Hours**

17

SUSTAINABLE LOW-RISE RESIDENTIAL CONSTRUCTION

MINOR CODE - U126

This minor is designed to provide students with a background in sustainable low-rise residential (i.e. single family, multi-family town houses and 2-3 story apartment buildings) construction materials and practices.
School of Natural Resources

WDSC 245 Residential Building Materials 3
WDSC 320 Sustainable Construction 3
SAFM 470 Managing Construction Safety 3

A minimum of nine hours selected from the following:

WDSC 225 Finished Wood Products
WDSC 341 Wood Mechanics
ID 240 Codes and Interior Construction
ID 325 Computer-Aided Drafting and Design
DSGN 293 Special Topics

Total Hours 18

WILDLIFE AND FISHERIES RESOURCES

MINOR CODE - U044

The Wildlife and Fisheries Resources minor is designed to provide students with the necessary background and skills to effectively conserve and manage fish and wildlife habitats and populations. A minimum GPA of 2.0 is required in all minor courses.

Minor Requirements

WMAN 175 Introduction to Wildlife and Fisheries 3
WMAN 224 Vertebrate Natural History 3

Select Three of the following courses 9-12

WMAN 300 Wildlife and Fisheries Techniques
WMAN 313 Wildlife Ecosystem Ecology
WMAN 330 Conservation Genetics
WMAN 425 Mammalogy
WMAN 426 Ornithology
WMAN 445 Introduction to Fisheries Management
WMAN 446 Limnology
WMAN 450 Advanced Wildlife and Fisheries Management

Total Hours 15-18

WOOD SCIENCE AND TECHNOLOGY

The minor in Wood Science and Technology is designed to provide students with specialized knowledge and skills in the properties, manufacture, and utilization of wood and related biomaterial products. Emphasis is given to courses that provide a fundamental education in the properties of wood, manufacturing processes for wood-based materials, and utilization of wood materials.

MINOR CODE - U045

A minimum GPA of 2.0 is required in all minor courses

Required Courses

WDSC 223 Wood Anatomy and Structure 3

Select one of the following. 3

WDSC 340 Physical Properties of Wood
WDSC 341 Wood Mechanics
WDSC 413 Wood Chemistry

Select four of the following: 12

WDSC 100 Forest Resources in United States History
WDSC 232 Wood Grading and Procurement
WDSC 320 Sustainable Construction
WDSC 330 Wood Machining
WDSC 337 Wood Adhesion and Finishing
WDSC 340 Physical Properties of Wood
WDSC 341 Wood Mechanics
WDSC 351 Forest Products Protection
WDSC 362 Forest Product Decision-Making
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>WDSC 413</td>
<td>Wood Chemistry</td>
</tr>
<tr>
<td>WDSC 422</td>
<td>Harvesting Forest Products</td>
</tr>
<tr>
<td>WDSC 465</td>
<td>Wood-based Composite Materials</td>
</tr>
</tbody>
</table>

Total Hours: 18