Forest Resources Management, B.S.F.

Degree Offered

• Bachelor of Science in Forestry

Nature of the Program

In sustainable forestry, we balance the growing demand for forest products with the value of wildlands and public spaces for recreation, wildlife habitat, watershed protection, aesthetics, and the protection of the environment. A dedicated, dynamic and diverse faculty in the Forestry program offers a curriculum that provides scientific, technical, and managerial knowledge needed by professionals managing our sustainable forest resources. As the third most forested state in the U.S., West Virginia's forests are our outdoor classroom.

Visit the Forest Resources Management (https://forestry.wvu.edu/undergraduate/majors/forest-resources-management/) major page for more information or contact the program coordinator Dr Greg Dahle at Gregory.Dahle@mail.wvu.edu or 304-293-6292. If you are in the area, visit our Forest Resources Management office in the Division of Forestry and Natural Resources, 337 Percival Hall, P.O. Box 6125, West Virginia University, Morgantown, WV 26506-6125.

Curriculum Structure

The curriculum is accredited by the Society of American Foresters (SAF) which means that there is a nationwide recognition of the quality of courses offered in this degree. The degree encompasses 120 credit hours of coursework. Required courses in biological, physical, and social sciences, English language, and mathematics form the foundation for core courses in the science and practice of managing and conserving forests and associated natural resources. Ample field experience is provided in a five-week summer field practice and in the laboratories in many of the forestry courses.

In addition to the core forestry curriculum, students select one Area of Emphasis to develop competence in specialized areas:

• Forest Management
• Forest Ecosystem Science & Sustainability
• Arboriculture & Urban Forestry

Students can also pursue minors in Recreation, Conservation Ecology, Wood Science or one of the many other minors available at WVU.

Extracurricular opportunities comprise joining one of our clubs: Arboriculture, Society of American Foresters, Timbersports team, or Women in Natural Resources.

Career Opportunities

A Bachelor of Science in Forestry is the path to a variety of careers. Many graduates become professional forest resource managers with government agencies, such as the USDA Forest Service and state forestry services. Graduates who work for these agencies carry out conservation practices on public lands like state parks, national forests, and range lands. Others help private woodlands owners reach their timber, wildlife, water, and recreation objectives.

WVU Forestry graduates are also employed by the forest industry producing lumber, paper, or engineered wood products. Other graduates find careers in utility forestry or become natural resources managers for oil and gas companies in the Appalachian region, and some move on to graduate degrees.

As a forester, you can expect to spend time in the field estimating the volume and value of timberland areas, planning and supervising timber harvesting operations, protecting forest from fire, insects, and disease, and managing forests for health and resilience. Managerial work includes; developing plans for providing carbon credits to landowners, developing sustainable forest management plans, and managing forests for multiple uses including recreation, timber, watershed, wildlife, and environmental protection.

Urban foresters work for city governments, private companies, or nonprofit organizations to increase urban canopy coverage, promote urban ecosystem services, maintain healthy trees, or minimize the impacts of development. Our graduates are employed by national or local tree care company. They climb and pruning trees, planting trees, and care for urban tree health by diagnosing and treating pest & disease.

Admissions

• First-Time Freshmen are admitted directly into the major.
• Students transferring from another major at WVU are directly admitted to the Forest Resource Management major if they are in good academic standing (2.00 overall GPA).
• Students transferring from another institution are directly admitted to the Forest Resource Management major if they are in good academic standing (2.00 overall GPA).
Due to Covid-19, admission requirements may differ from what is listed on this page. Please review the most up-to-date program admission requirements for the Bachelor of Science in Forestry major.

**ADMISSION REQUIREMENTS 2022-2023**

The Admission Requirements above will be the same for the 2022-2023 Academic Year.

Major Code: 0725

Click here to view the Suggested Plan of Study (p. 4)

**General Education Foundations**

Please use this link to view a list of courses that meet each GEF requirement. ([http://registrar.wvu.edu/gef/](http://registrar.wvu.edu/gef/))

**NOTE:** Some major requirements will fulfill specific GEF requirements. Please see the curriculum requirements listed below for details on which GEFs you will need to select.

**General Education Foundations**

<table>
<thead>
<tr>
<th>F1 - Composition &amp; Rhetoric</th>
<th>3-6</th>
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</thead>
<tbody>
<tr>
<td>ENGL 101</td>
<td>Introduction to Composition and Rhetoric</td>
</tr>
<tr>
<td>&amp; ENGL 102</td>
<td>and Composition, Rhetoric, and Research</td>
</tr>
<tr>
<td>or ENGL 103</td>
<td>Accelerated Academic Writing</td>
</tr>
</tbody>
</table>

| F2A/F2B - Science & Technology | 4-6 |
| F3 - Math & Quantitative Reasoning | 3-4 |
| F4 - Society & Connections | 3 |
| F5 - Human Inquiry & the Past | 3 |
| F6 - The Arts & Creativity | 3 |
| F7 - Global Studies & Diversity | 3 |
| F8 - Focus (may be satisfied by completion of a minor, double major, or dual degree) | 9 |

**Total Hours** 31-37

Please note that not all of the GEF courses are offered at all campuses. Students should consult with their advisor or academic department regarding the GEF course offerings available at their campus.

**CURRICULUM REQUIREMENTS**

The Writing and Communications Skills requirement in the FRM curriculum is fulfilled through the different major courses that FRM students are required to take, as well as in FRM elective courses. Most of these FMAN courses (e.g., FMAN 212, FMAN 222, FMAN 311, FMAN 320, FMAN 330, FMAN 423, FMAN 433, FMAN 434) have significant writing components where students are required to prepare full technical reports like laboratory reports, management plan write-ups, and other writing assignments. Most of these writing requirements provide a feedback mechanism to students’ writing (e.g., reports are corrected then given back to students for revisions). In addition to addressing the writing skills of students, some of these courses also require students to deliver oral presentations, particularly in the capstone course (FMAN 434).

**University Requirements**

<table>
<thead>
<tr>
<th>Category</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>University Requirements</td>
<td>18</td>
</tr>
<tr>
<td>Forest Resources Management Program Requirements</td>
<td>54</td>
</tr>
<tr>
<td>Forest Resources Management Major Requirements</td>
<td>48</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
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**University Requirements**

<table>
<thead>
<tr>
<th>Category</th>
<th>Hours</th>
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<tr>
<td>General Education Foundations (GEF) 1, 2, 3, 4, 5, 6, 7, and 8 (31-37 Credits)</td>
<td>31-37</td>
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<tr>
<td>Outstanding GEF Requirements 1, 6, and 7</td>
<td>12</td>
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<tr>
<td>ANRD 191</td>
<td>First-Year Seminar</td>
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<td>General Electives</td>
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<tr>
<td><strong>Total Hours</strong></td>
<td><strong>18</strong></td>
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</table>

**Forest Resource Management Program Requirements**

All required FOR, FMAN, FHYD, and WDSC courses must be completed with a minimum grade of C- or better.

**Math and Science Coursework**
Select one of the following: 4

BIOL 101 General Biology
& BIOL 103 and General Biology Laboratory
BIOL 115 Principles of Biology
& BIOL 116 and Principles of Biology Laboratory

Select one of the following: 4

CHEM 111 Survey of Chemistry 1
& 111L and Survey of Chemistry 1 - Laboratory
CHEM 115 Fundamentals of Chemistry
& 115L and Fundamentals of Chemistry 1 - Laboratory
MATH 124 Algebra with Applications (or MATH 150 based on placement**)

Additional Math or Science Course 3

BIOL 102 General Biology
& BIOL 104 and General Biology Laboratory
BIOL 105 Environmental Biology
& BIOL 106 and Environmental Biology Laboratory
CHEM 112 Survey of Chemistry 2
& 112L and Survey of Chemistry 2 - Laboratory
GEOG 106 Physical Geography Laboratory
& GEOG 107 and Global Climate System
GEOG 149 Digital Earth Lab
& GEOG 150 and Digital Earth
GEOL 101 Planet Earth
& GEOL 102 and Planet Earth Laboratory
MATH 128 Plane Trigonometry
MATH 150 Applied Calculus

Non-Math and Science Program Requirements

AGRN 202 Principles of Soil Science 3
AGRN 203 Principles of Soil Science Laboratory 1
COMM 104 Fundamentals of Public Communication 3
ECON 201 Principles of Microeconomics 3
or ARE 150 Introductory Agricultural and Agribusiness Economics
FMAN 212 Forest Ecology 3
FMAN 222 Forest Mensuration 4
FOR 140 West Virginia's Natural Resources 3
FOR 205 Dendrology 3
FOR 206 Winter Dendrology 1
FOR 240 Introduction to Computing in Natural Resources 3
PLSC 206 Principles of Plant Science 4
STAT 211 Elementary Statistical Inference 3
WDSC 223 Wood Anatomy and Structure 3
WMAN 150 Principles of Conservation Ecology 3
or WMAN 200 Restoration Ecology

Total Hours 54

Forest Resources Management Major Requirements

A minimum GPA of 2.0 is required for all Forest Resources Management major courses.

All required FOR, FMAN, FHYD, and WDSC courses and all courses completing the required AOE must be completed with a minimum grade of C- or better.

Choose from one of the following: 4

ENTO 470 Forest Pest Management
PPTH 470 Forest Pest Management
FHYD 444 Watershed Management 3
FMAN 311 Silvicultural Systems 4
### SUGGESTED PLAN OF STUDY

#### First Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
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<tbody>
<tr>
<td>FOR 140</td>
<td>3</td>
<td>3 FOR 240</td>
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<tr>
<td>Choose one of the following (GEF 2):</td>
<td></td>
<td>4 PLSC 206 (GEF 8)</td>
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<tr>
<td>BIOL 101 &amp; BIOL 103</td>
<td></td>
<td>Choose one of the following (GEF 8):</td>
<td></td>
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<tr>
<td>BIOL 115 &amp; BIOL 116</td>
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<td>CHEM 111 &amp; 111L</td>
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<tr>
<td>ENGL 101 (GEF 1)</td>
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<td>CHEM 115 &amp; 115L</td>
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<td>MATH 124 (GEF 3)</td>
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<td>Additional Science Course</td>
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<tr>
<td>ANRD 191</td>
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#### Second Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
<th>Summer</th>
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<tbody>
<tr>
<td>FOR 205</td>
<td>3</td>
<td>3 FMAN 212</td>
<td>3</td>
<td>FMAN 400</td>
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<tr>
<td>AGRN 202</td>
<td>3</td>
<td>3 FMAN 222</td>
<td>4</td>
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<tr>
<td>AGRN 203</td>
<td>1</td>
<td>WMAN 150 or 200</td>
<td>3</td>
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<tr>
<td>STAT 211 (GEF 8)</td>
<td>3</td>
<td>ECON 201 (GEF 4)</td>
<td>3</td>
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<tr>
<td>ENGL 102 (GEF 1)</td>
<td>3</td>
<td>GEF 6</td>
<td>3</td>
<td></td>
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<tr>
<td>COMM 104 (GEF 5)</td>
<td>3</td>
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<td></td>
<td>16</td>
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#### Third Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
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<tbody>
<tr>
<td>FMAN 311</td>
<td>4</td>
<td>4 FMAN 330</td>
<td>4</td>
</tr>
<tr>
<td>FOR 438</td>
<td>3</td>
<td>3 FOR 326</td>
<td>3</td>
</tr>
<tr>
<td>WDSC 223</td>
<td>3</td>
<td>3 Area of Emphasis Course</td>
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</tr>
<tr>
<td>GEF 7</td>
<td>3</td>
<td>3 General Elective</td>
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<tr>
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<td>13</td>
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</table>

#### Fourth Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours</th>
<th>Spring</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMAN 433</td>
<td>3</td>
<td>3 FMAN 434</td>
<td>3</td>
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</tbody>
</table>
FOR 421  
Area of Emphasis  
Course  
Area of Emphasis  
Course  
General Elective  
Course  

| FOR 206 | PPTH 470 | ENT 470 | Total credit hours: 120  

### Areas of Emphasis

- Arboriculture & Urban Forestry (p. 5)
- Forest Ecosystem Science and Sustainability (p. 5)
- Forest Management (p. 6)

### ARBORICULTURE & URBAN FORESTRY AREA OF EMPHASIS

All courses that count toward this area of emphasis must be completed with a minimum grade of C-.

**Minimum GPA of 2.0 as required by the Forest Resource Management major.**

#### Required Courses

- FMAN 320 Arboriculture and Urban Trees  
- FMAN 423 Urban Forest Management

#### Restricted Electives

- AGRN 315 Turfgrass Management  
- AGRN 410 Soil Fertility  
- ARE 204 Agribusiness Management  
- BIOL 350 Plant Physiology  
- BIOL 361 Plant Ecology  
- FMAN 251 Forest Fire Protection  
- FMAN 315 Survey of Arboriculture  
- FMAN 491 Professional Field Experience  
- FMAN 496 Senior Thesis  
- GEOG 205 Climate and Sustainability

Total Hours: 12

### FOREST ECOSYSTEM SCIENCE AND SUSTAINABILITY AREA OF EMPHASIS

All courses that count toward this area of emphasis must be completed with a minimum grade of C-.

**Minimum GPA of 2.0 as required by the Forest Resource Management major.**

- GEOG 415 Global Environmental Change

#### Restricted Electives

- BIOL 361 Plant Ecology  
- BIOL 448 Plant-Microbial Interactions  
- BIOL 462 Ecosystem Models  
- BIOL 463 Global Ecology  
- ENVP 401 Environmental Microbiology  
- FMAN 491 Professional Field Experience  
- FMAN 496 Senior Thesis  
- GEOG 205 Climate and Sustainability  
- GEOG 457 Open-Source Spatial Analytics  
- GEOL 486 Environmental Isotopes  
- RESM 545 Spatial Hydrology and Watershed Analysis

Total Hours: 9
FOREST MANAGEMENT AREA OF EMPHASIS

All courses that count toward this area of emphasis must be completed with a minimum grade of C-.

Minimum GPA of 2.0 as required by the Forest Resource Management major.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>WDSC 232</td>
<td>Wood Grading and Procurement</td>
<td>3</td>
</tr>
<tr>
<td>WDSC 422</td>
<td>Harvesting Forest Products</td>
<td>3</td>
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Restricted Electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tr>
<td>FMAN 251</td>
<td>Forest Fire Protection</td>
</tr>
<tr>
<td>FMAN 315</td>
<td>Survey of Arboriculture</td>
</tr>
<tr>
<td>FMAN 320</td>
<td>Arboriculture and Urban Trees</td>
</tr>
<tr>
<td>FMAN 322</td>
<td>Advanced Forest Measurements</td>
</tr>
<tr>
<td>FMAN 413</td>
<td>Regional Silviculture</td>
</tr>
<tr>
<td>FMAN 423</td>
<td>Urban Forest Management</td>
</tr>
<tr>
<td>FMAN 491</td>
<td>Professional Field Experience</td>
</tr>
<tr>
<td>FMAN 496</td>
<td>Senior Thesis</td>
</tr>
<tr>
<td>FOR 411</td>
<td>Sugarbush Management and Maple Syrup Production</td>
</tr>
<tr>
<td>FOR 424</td>
<td>Vegetation of West Virginia</td>
</tr>
<tr>
<td>FOR 425</td>
<td>Global Forest Resources</td>
</tr>
</tbody>
</table>

Total Hours 12

Major Learning Outcomes

FOREST RESOURCES MANAGEMENT

Students graduating from the Forest Resources Program should be able to:

Learning Outcome 1: Describe, identify, and quantify forest ecosystem resources across different parts of the central Appalachian region and different biomes.

Learning Outcome 2: Describe the assemblages of flora and fauna across the landscape and identify patterns and potential impacts of management and restoration activities as they relate to freshwater ecosystem services (water quality, quantity, habitat), soils, and ecological principles.

Learning Outcome 3: Explain ecological processes, including the effects of human impacts, as they pertain to the sustainable forest management.

Learning Outcome 4: Develop and evaluate forest management alternatives based on knowledge from forest mensuration, silviculture, forest ecology, forest economics, forest hydrology and soils, and forest policy.

Learning Outcome 5: Quantify forest resources and predict future growth using growth and yield models.

Learning Outcome 6: Develop a forest management plan for forest landowners and present forest management plan recommendations through technical writing and oral presentation.

FMAN 191. First-Year Seminar. 1-3 Hours.
Engages students in active learning strategies that enable effective transition to college life at WVU. Students will explore school, college and university programs, policies and services relevant to academic success. Provides active learning activities that enable effective transition to the academic environment. Students examine school, college and university programs, policies and services.

FMAN 212. Forest Ecology. 3 Hours.
PR: FOR 205. Forest and environment factors; site and type characteristics.

FMAN 222. Forest Mensuration. 4 Hours.
PR: MATH 155 and STAT 211. Estimating volume and growth of trees and forest stands with emphasis on the mathematical and statistical techniques involved. Laboratories include practical field experience.

FMAN 251. Forest Fire Protection. 2 Hours.
Prevention, detection, and control of wildfires. Forest fuels, fire weather, and wildfire behavior. Use of fire for forest management purposes.

FMAN 293. Special Topics. 1-6 Hours.
PR: Consent. Investigation of topics not covered in regularly scheduled courses.
FMAN 311. Silvicultural Systems. 4 Hours.  
PR: FOR 205 and ((FMAN 212 and FMAN 222) or WMAN 313). The theory and practice of controlling forest stand establishment, composition, structure, and growth. Systems include: reproduction methods, release operations, and intermediate treatments. Pre-requisite(s) and/or co-requisite(s) may differ on regional campuses.

FMAN 315. Survey of Arboriculture. 1 Hour.  
PR: HORT 260 or FOR 205. A self-study seminar that surveys the principles and practices involved in the field of arboriculture with major emphasis on the urban landscape.

FMAN 320. Arboriculture and Urban Trees. 3 Hours.  
This course will discuss the biology and management (selection, installation, maintenance and preservation) of landscape trees. Students will learn how to prune, install, evaluate risk and preserve individual trees in the landscape.

FMAN 322. Advanced Forest Measurements. 3 Hours.  
PR: FMAN 222 or equivalent. Measurement and computer simulation of forest growth; principles of growth and yield; statistical methods applied to forest measurement problems.

FMAN 330. Principles of Forestry Economics. 4 Hours.  
PR: (ECON 201 or ARE 150) and ECON 202. Production, distribution and use of forest goods and services. Emphasis on methods and problem solving techniques in the economic aspects of forestry.

FMAN 400. Forest Resources Management Field Practice. 6 Hours.  
PR: CE 200 and FMAN 322. Application and study of forest management practices with emphasis on field problems, including a one-week trip to observe forestry outside the Appalachian hardwood region. (Course will be taught during five consecutive six-day weeks.).

FMAN 413. Regional Silviculture. 3 Hours.  
PR: FMAN 212 and PR or CONC: FMAN 311 or FOR 310 and Forestry major or consent. Major forest types of the United States; their composition, management, problems, and silvicultural treatment.

FMAN 423. Urban Forest Management. 3 Hours.  
We will discuss the management of trees in the developed landscape. The focus will include trees growing along city streets, residential landscapes, parks and corporate/academic campus.

FMAN 433. Forest Management. 3 Hours.  

FMAN 434. Forest Resources Management Planning. 3 Hours.  
PR: FMAN 322 and FMAN 400 and FMAN 311 and PR or CONC: (ENTO 470 or PPTH 470) and FMAN 330. Integrated planning of long-term management of forest resources. Development of a management plan for an actual forest tract. Emphasis on biological, social, economic and ethical considerations in decision-making.

FMAN 440. Forestry Consulting. 3 Hours.  
PR: FMAN 311 and FMAN 330 or consent. The application of forest management principals and business concepts to the consulting forestry profession. Topics include: natural resource inventories, timberland appraisals, timber sale administration, and forest management planning.

FMAN 450. Forest Valuation and Investment. 3 Hours.  

FMAN 490. Teaching Practicum. 1-3 Hours.  
PR: Consent. Teaching practice as a tutor or assistant.

FMAN 491. Professional Field Experience. 1-18 Hours.  
PR: Consent. (May be repeated up to a maximum of 18 hours.) Prearranged experiential learning program, to be planned, supervised, and evaluated for credit by faculty and field supervisors. Involves temporary placement with public or private enterprise for professional competence development.

FMAN 493. Special Topics. 1-6 Hours.  
PR: Consent. Investigation of topics not covered in regularly scheduled courses.

FMAN 494. Seminar. 1-3 Hours.  
PR: Consent. Presentation and discussion of topics of mutual concern to students and faculty.

FMAN 496. Senior Thesis. 1-3 Hours.  
PR: Consent.

FMAN 498. Honors. 1-3 Hours.  
PR: Students in Honors Program and consent by the honors director. Independent reading, study or research.