

**SUNY-ESF  
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*Student Handbook*

**for**

**Undergraduate Studies in**

**The Department of Forest and  
Natural Resources Management**

**August 2011**



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## Preface

Welcome to the 2011-12 Academic Year! This is the current version of the *Student Handbook*. Please retain this handbook, as it will be your guide throughout your degree program at ESF. If you read this handbook, your adviser has the tools to work with you on developing the best possible program of study for you.

Please read the first six pages of this handbook and then the pages appropriate to your degree program:

Forest Resources Management	pages 8-15
Natural Resources Management	pages 16-22
Forest Ecosystem Science	pages 23-31

We always are looking for ways to improve this handbook and our advising services. Please let us know what we can do to make your undergraduate program more effective for you.

David Newman, Chair, Department of Forest and Natural Resources Management  
Christopher Nowak, Chair, FNRM Undergraduate Studies Committee, and Curriculum  
Coordinator

*August 29, 2011*

## Undergraduate Programs in Forest and Natural Resources Management

### ***Mission and Vision***

ESF's Forest and Natural Resources Management (FNRM) programs are science-based and values-driven. The integration of values and scientific facts characterize professions that are successful in democracies. ESF-trained foresters are able to integrate these two threads in America's complex society.

The FNRM mission statement is:

***The mission of the ESF Forest and Natural Resources Management programs is to produce and to transmit knowledge about the function and dynamics of forests and related renewable resources to all of our customers; to encourage continual learning about forest and related renewable resources and their role in making people's lives better; and to develop leaders who will manage renewable resources for people on a sustainable basis.***

Our vision of professional resource managers is that they are problem solvers. They have mastered integration of disciplinary knowledge and have the necessary skills to protect and manage forest and natural resources. ESF-educated resource managers are leaders who help people solve the complex problems of the world's natural resources.

Goals—Our Forest and Natural Resources programs have four broad goals:

- ◆ Understand the function and dynamics of forests and related renewable resources;
- ◆ Attain the skills to manipulate forests and related natural resource systems and to predict the consequences;
- ◆ Monitor citizen and owner values regarding forests and natural resources and respect them; and
- ◆ Integrate values with scientific facts and know the limits of our knowledge.

Professional forestry education began over a century ago in New York. In 2002, a parallel program in Natural Resources Management was added to capture the current breadth of faculty and student interests in renewable resources and their management. Today's resources management programs are based on a clear vision that combines professional competency with a strong foundation in the biophysical sciences, humanities and social sciences.

Students in ESF's Forest and Natural Resources Management programs like forests and the out-of-doors. They want to be in rural settings, they enjoy nature, and they want to master the knowledge and skills needed to conserve and manage forests and the environment. With 25,000 acres of forestlands as teaching laboratories, ESF provides many opportunities to meet student needs. The forest technology and land surveying technology programs at ESF's Wanakena campus prepares young people for careers in fieldwork and is a route to Forest and Natural Resources Management programs that emphasizes experiential learning. Internships with forest-based/natural resource-based organizations in the business, public and nonprofit sectors amplify these hands-on experiences. Experiential learning is combined with learning concepts and skills

in the classroom and laboratory on ESF's Syracuse campus. The results are among the best anywhere in North America.

### ***Educational Objectives***

ESF's Department of Forest and Natural Resources Management has identified nine outcomes based educational objectives for each of its undergraduate degree programs.

#### ***Forest Resources Management (FRM) Educational Objectives***

1. **Understanding Forests** – Know the relationships among flora and fauna including the biological and physical requirements of different plant and animal species within a forested ecosystem.
2. **Measuring Forests** – Identify the major species, both flora and fauna, in a given area correctly. Plan, conduct, and analyze forest inventories including biological, physical, and social. Be able to describe and apply different statistical sampling methods used in measuring forests. Be able to project stand and forest development. Knowledge, and use, of computer growth and yield projection models.
3. **Manipulating Forests** – Describe alternative ways to change or maintain forest structure. Prescribe, justify, and implement treatments in accord with owner objectives.
4. **Managing Forests** – Evaluate tradeoffs among biological sustainability, economic feasibility, and social acceptability with respect to alternative forest management plans. Be able to describe and apply appropriate decision-making tools and techniques (e.g., investment analyses) to evaluate alternative forest management practices. Specify and implement management practices appropriate to ownership objectives.
5. **Policy Making** – Understand policy making processes at national, state, and local levels, for both large and small organizations as these processes affect forest management.
6. **Communicating** – Explain forest development, manipulation, and management to different audiences in both written and oral form. Describe technical forestry terms to many different audiences using consistent and accurate terminology.
7. **Ethics** – Act in an honest and credible manner and take responsibility for the work of your team and your actions. Exhibit tolerance for different viewpoints and opinions of others that may not agree with yours by understanding values and value systems used by people to reach decisions and to take actions.
8. **Problem Solving** – The act of defining a problem; determining the cause of the problem; identifying, prioritizing and selecting alternatives for a solution (e.g., strategic, tactical and operational planning); and implementing a solution. Understand the conceptual framework of each problem solving step and be able to facilitate a team through a systematic process for problem solving.
9. **Leading** – Recognize the union between leading and following. Demonstrate effective teamwork skills.

***Natural Resources Management (NRM) Educational Objectives***

1. **Understanding Natural Environments** – Know the relationships among organic and inorganic resources, including the biological and physical requirements of different plant and animal species, within forest and watershed ecosystems, and how humans interact with these resources.
2. **Measuring Natural Resources** – Correctly identify the major species of both flora and fauna in a given area. Assess the extent of human impacts on forests, watersheds, and other natural areas. Plan, conduct, and analyze forest and watershed ecosystem and/or natural area inventories for biological, physical, and social resources. Be able to describe and apply different statistical sampling methods to user groups, forests, watersheds, and/or natural areas.
3. **Manipulating Natural Resources** – Describe alternative ways to manage forest and watershed ecosystems and natural areas for recreation, and/or watershed protection/restoration/enhancement purposes. Prescribe, justify, and implement management strategies for forest and watershed ecosystems and natural areas in accord with owner objectives.
4. **Managing Natural Resources** – Evaluate tradeoffs among biological sustainability, economic feasibility, and social acceptability with respect to alternative natural resource management plans. Be able to describe and apply appropriate decision-making tools and techniques to human and/or natural resource management practices. Specify and implement management practices appropriate to ownership objectives.
5. **Policy Making** – Understand policy-making processes at national, state, and local levels for both large and small organizations as these processes affect the management of stakeholder groups and natural resources.
6. **Communicating** – Explain forest, watershed, recreation, and/or natural area development, manipulation, and management to different audiences in both written and oral form. Describe related technical terms to many different audiences using consistent and accurate terminology.
7. **Ethics** – Act in an honest and credible manner and take responsibility for the work of your team and your actions. Exhibit tolerance for different viewpoints and opinions of others that may not agree with yours by understanding values and value systems used by people to reach decisions and to take actions.
8. **Problem Solving** – Be able to define a problem; determine the cause of the problem; identify, prioritize and select alternatives for a solution (e.g., strategic, tactical and operational planning); and implement a solution. Understand the conceptual framework of each problem solving step and be able to facilitate a team through a systematic process for problem solving.
9. **Leading** – Recognize the union between leading and following. Demonstrate effective teamwork skills.

***Forest Ecosystem Science (FES) Educational Objectives***

1. **Understanding Forests** – Know the relationships among flora and fauna including the biological and physical requirements of different plant and animal species within a forested ecosystem.
2. **Measuring Forests** – Identify the major species, both flora and fauna, in a given area correctly. Plan, conduct, and analyze forest inventories including biological, physical, and social. Be able to describe and apply different statistical sampling methods used in measuring forests. Be able to project stand and forest development. Knowledge, and use, of computer growth and yield projection models.
3. **Manipulating Forests** – Describe alternative ways to change or maintain forest structure. Prescribe, justify, and implement treatments in accord with owner objectives.
4. **Managing Forests** – Evaluate tradeoffs among biological sustainability, economic feasibility, and social acceptability with respect to alternative forest management plans. Be able to describe and apply appropriate decision-making tools and techniques (e.g., investment analyses) to evaluate alternative forest management practices. Specify and implement management practices appropriate to ownership objectives.
5. **Policy Making** – Understand policy making processes at national, state, and local levels, for both large and small organizations as these processes affect forest management.
6. **Communicating** – Explain forest development, manipulation, and management to different audiences in both written and oral form. Describe technical forestry terms to many different audiences using consistent and accurate terminology.
7. **Ethics** – Act in an honest and credible manner and take responsibility for the work of your team and your actions. Exhibit tolerance for different viewpoints and opinions of others that may not agree with yours by understanding values and value systems used by people to reach decisions and to take actions.
8. **Problem Solving** – The act of defining a problem; determining the cause of the problem; identifying, prioritizing and selecting alternatives for a solution (e.g., strategic, tactical and operational planning); and implementing a solution. Understand the conceptual framework of each problem solving step and be able to facilitate a team through a systematic process for problem solving.
9. **Leading** – Recognize the union between leading and following. Demonstrate effective teamwork skills.

The measurement of these outcomes is to be based on Bloom's Cognitive Levels of Knowledge (Table 1.1).

**Table 1.1. Bloom's Cognitive Levels of Knowledge<sup>1</sup>**

<b>Bloom's Cognitive Levels</b>	<b>Activities</b>
Definition	Remembering facts, terms, concepts, definitions, principles
Comprehension	Explain, predict, interpret, infer, summarize, translate, give examples of the meaning of material to an intelligent person with no formal training in forestry
Application	Apply, solve, show make use of, modify, demonstrate, compute problems unlike those described in class
Analysis	Breakdown material into component parts to describe, explain, and interpret interrelationships; compare & contrast
Synthesis	Produce something new or original from component parts, design, construct, develop, formulate
Evaluation	Make a judgment based on a pre-established set of criteria, appraise, evaluate, justify, judge

The Department of Forest and Natural Resources Management has defined the minimum competency level as *Analysis*. This level of knowledge is our target for all nine educational objectives. While not every course deals with each of the nine educational objectives, we have structured the current curriculum to help us meet our goals by graduation.

These traits are best developed by a broad base in writing and public speaking, the natural sciences, mathematics, and the social sciences and humanities. The majority of work scheduled during the first two years (lower division) is in these basics.

<sup>1</sup> Bloom, B.S., ed. 1956. *Taxonomy of Educational Objectives, Vol. 1: Cognitive Domain*. McKay, NY.

**Comparison of course & credit hour requirements among FNRM degree programs**

	FRM	NRM	FES
<b>SUNY General Education* and lower division courses</b>			
*American History	3	3	3
*Western Civilization	3	3	3
*Other World Civilizations	3	3	
*The Arts	3	3	
*Social Sciences (Economics)	3	3	3
*Natural Sciences (Biology I &/or II w/laboratory)	4	8	8
*Basic Communications (English I & II with a focus on writing)	6	3	6
*Humanities	-†	3	-†
*Math (Precalculus)	3	3	
*Math (Calculus)			4
Chemistry I &/or II (w/laboratory) and/or Physics	8	8	12
Introduction to Probability and Statistics	3	3	3
Principles of Management	3	3	3
Information Literacy	1	1	1
Public Speaking	3	3	
General or Field Ecology (w/laboratory)		4	
Sociology or Psychology		3	
Subtotal	<b>46</b>	<b>57</b>	<b>46</b>
<b>Common Required Professional courses</b>			
ESF 300 Introduction to Geospatial Information Technologies	3	3	3
FOR 132 Freshman orientation seminar	1	1	1
FOR 304 Adirondack Field Studies	4	4	4
FOR 345 Introduction to Soils	3	3	3
FOR 465 Natural Resources Policy	3	3	3
FOR 490 Integrated Resources Management	3	3	3
Subtotal	<b>17</b>	<b>17</b>	<b>17</b>
<b>Program Specific Required Professional courses</b>			
FOR 333 Managerial Economics for Environmental Professionals	3	3	
FOR 372 Fundamentals of Outdoor Recreation	3	3	
EFB 336 Dendrology	3		3
FOR 322 Forest Mensuration	3		3
FOR 323 Forest Biometrics	3		3
FOR 332 Forest Ecology	3		3
FOR 334 Silviculture	4		4
FOR 232 Natural Resources Ecology	3		3
FOR 370 Forest Management Decision Making and Planning	3		
FOR 373 Forest Operations	3		
FOR 402 Professional Mentoring Program	1		
EWP 405 Writing for Scientific Professionals		3	
FOR 321 Forest Ecology & Silviculture		3	
FOR 340 Watershed Hydrology		3	
Subtotal	<b>32</b>	<b>15</b>	<b>19</b>
<b>Directed electives</b>	<b>15</b>	<b>12</b>	<b>27</b>
<b>Free electives</b>	<b>18</b>	<b>21</b>	<b>15</b>
<b>TOTAL</b>	<b>128</b>	<b>122</b>	<b>124</b>

† fulfilled through second writing course, EWP290

## Forest Resources Management

Professional forestry education has been featured at ESF since the College's founding in 1911. Today's Forest Resources Management program is based on a clear vision that combines professional competency with a strong foundation in the biophysical sciences, humanities, and social sciences to meet society's needs for forest managers.

Many ESF students enjoy trees and forests and want to work in forested settings. They appreciate nature, and want to master the knowledge and skills needed to conserve and manage forests and the environment. With 25,000 acres of college forestlands as teaching and research laboratories, ESF provides many opportunities to meet student needs for experiential learning. The Forest Technology program at ESF's Wanakena campus prepares students for careers in field forestry and is a route to the Forest Resources Management program that emphasizes field practice. Internships with forest-based organizations in the private, public and nonprofit sectors amplify these hands-on experiences. Practical experience is combined with learning concepts and problem solving and critical thinking skills in the classroom and laboratory on ESF's Syracuse campus. Outcomes are among the best anywhere in North America.

Forest Resources Management is an integration of forest ecology and biology, forest measurements, forest policy and administration, and courses to predict and evaluate the effects of manipulation. Timber, water, recreation, wildlife, and a broad array of environmental values and services, such as biodiversity and healthy forest systems, are important results of effective management. This major prepares students to be well-rounded generalists who can practice forestry and succeed as professionals in a variety of allied natural resources management fields.

Forest resources management offers a wide variety of employment opportunities. Our graduates are working throughout the United States as professional foresters and natural resource managers in private industry, public agencies, and for nonprofit organizations. Their duties can range from timber management to recreation planning to environmental education, to name a few.

The educational program in Forest Resources Management leading to the first professional degree in forestry is accredited by the Society of American Foresters (SAF). SAF is recognized by the Commission on Recognition of Postsecondary Accreditation as the specialized accrediting body for forestry in the United States

### ***Program Requirements***

The Summer Program in Forest and Natural Resources Management is required for ALL students in Forest Resources Management (except those who attend the Forest Technology and Land Surveying Technology Program at the Ranger School, Wanakena Campus). The Summer Program is a four-week session that begins at the end of May and lasts through June. It is taught at ESF's Wanakena Campus on Cranberry Lake. The program consists of one course: Adirondack Field Studies (FOR 304). The Summer Program is designed to be completed after the Sophomore year and must be completed before Junior year.

Students have expectations of the Forest Resources Management program and its faculty, and the faculty have expectations of the students as well. Students are expected to enter their junior year with the ability to write and speak clearly. Work should be presented in a professional manner, and criticism should be given and accepted in this same spirit. Students are expected to

understand and use computers, including word processing of manuscripts, spreadsheets with functions, and basic database management. Students should be mature, active learners who want to develop professional judgment for conducting and supervising field and office operations.

### ***Avenues for Completion***

Students may follow one of three “paths” to enter and complete the Forest Resources Management program:

1. The “freshman” path is for students who enter ESF as a freshman and complete all degree requirements at ESF with the Summer Program in Forest and Natural Resources after the second year.
2. The “combined A.A.S/B.S.” path is for students who wish to have more field measurement and field problem solving skills and leadership development in context of forestry problems. The first year can be at ESF or another campus and the second year is spent at the Ranger School, Wanakena campus. Students then complete their B.S. degree requirements at ESF. This path can usually be completed in a total of four years.
3. The “transfer” path is for students who complete all or part of their lower division course work at another two or four-year campus, attend the Summer Program the summer before entering ESF, and complete the upper-division requirements at ESF. Students preparing to transfer to ESF with full junior status must have earned at least 60 credits of college course work.

### ***Summary of General Education and Professional Education Core Requirements***

The undergraduate curriculum in forest resources management consists of two broad categories of courses. The first category, general education, provides students with knowledge and skills that are useful and important for all educated persons regardless of their profession as well as preparation for advanced courses leading to a specific profession. The second category, professional courses, provides students with direct preparation for a career. The first two years of college usually focuses on general education and the second two on the professional studies.

<b>GENERAL EDUCATION CORE</b>	<b>CREDITS</b>
American History	3
Western Civilization	3
Other World Civilizations	3
The Arts	3
Probability and Statistics	3
Principles of Management	3
Economics	3
Information Literacy	1
English with a focus on Writing I & II	6
Humanities (fulfilled through writing course, EWP290)	-
Biology (w/laboratory)	4
Chemistry (w/laboratory)	4
<b>Physics</b>	4
Precalculus	3
Public Speaking	3
<b>Minimum credit hours</b>	<b>46</b>
<hr/>	
<b>PROFESSIONAL EDUCATION CORE</b>	<b>CREDITS</b>
Orientation Seminar: Forest and Natural Resources Mgt.	1
Adirondack Field Studies	4
Dendrology	3
Introduction to Geospatial Information Technologies	3
Silviculture	4
Natural Resources Ecology	3
Forest Ecology	3
Introduction to Soils	3
Forest Mensuration	3
Forest Biometrics	3
Forest Management Decision Making and Planning	3
Managerial Economics for Environmental Professionals	3
Forest Operations	3
Fundamentals of Outdoor Recreation	3
Natural Resources Policy	3
Professional Forestry Mentoring Program	1
Integrated Resources Management	3
Wildlife Management Technical Elective	3
Vegetation Management Technical Elective	3
Water Resources Technical Elective	3
Forest Health/Protection Technical Elective	3
Wood Technology/Science Technical Elective	3
<b>Minimum core credit hours</b>	<b>64</b>
Free electives	18
<b>Total required for graduation</b>	<b>128</b>

## Undergraduate Program Requirements

### Freshman and Sophomore Courses

Students may be admitted directly as first-year freshman students at ESF or through a variety of transfer options. Regardless of which way students enter ESF, they must complete both the general and professional education requirements. To meet degree requirements, students must successfully complete all lower- and upper-division courses. The following are lower division requirements presented in sample schedules for first-year students and transfer students at ESF.

### First-Year Freshmen at ESF

Below is a sample schedule of courses for students admitted to ESF's Syracuse campus programs as first-year freshmen.

Sample Freshman Year - Fall Semester			
Course		Cr. Hr.	Check Off
FOR132	Orientation Seminar: Forest and Natural Resources Mgt. <sup>1</sup>	1	_____
FOR207	Introduction to Economics (Gen. Ed. Social Science)	3	_____
EFB101/102	General Biology I and Lab (Gen. Ed. Natural Sciences)	4	_____
EWP190	Writing and the Environment (Gen. Ed. Communication)	3	_____
FCH150/151	General Chemistry Lecture I and Lab	4	_____
TOTAL		15	=====

Sample Freshman Year - Spring Semester			
Course		Cr. Hr.	Check Off
APM 104	College Algebra and Precalculus (Gen. Ed. Math)	3	_____
CMN220	Public presentation Skills for Env. Professionals	3	_____
EWP290	Writing, Humanities, and the Environment (Gen. Ed. Humanities)	3	_____
ESF200	Information Literacy	1	_____
FOR232	Natural Resources Ecology	3	_____
	Free Elective	3	_____
TOTAL		16	=====

<sup>1</sup>All students (freshmen and transfers) must take FOR 132.

<b>Sample Sophomore Year - Fall Semester</b>		
<b>Course</b>	<b>Cr. Hr.</b>	<b>Check Off</b>
EFB336 Dendrology	3	_____
FOR204 American History (Gen. Ed. American History)	3	_____
FOR332 Forest Ecology	3	_____
PHY101 Major Concepts of Physics I*	4	_____
Free Elective	3	_____
<b>TOTAL</b>	<u>16</u>	<u>_____</u>

\*EFB200 *Physics of Life* can be substituted for General Physics, but students are held to the 1-credit hour lab as a free elective

<b>Sample Sophomore Year - Spring Semester</b>		
<b>Course</b>	<b>Cr. Hr.</b>	<b>Check Off</b>
APM391 Introduction to Probability and Statistics	3	_____
FOR203 Western Civilizations (Gen. Ed. Western Civ.)	3	_____
Arts (Gen. Ed. The Arts)	3	_____
Other World Civilizations (Gen. Ed. Other World Civ.)	3	_____
Free Elective	3	_____
<b>TOTAL</b>	<u>15</u>	<u>_____</u>

### ***General Education Courses***

At least 27 credits in SUNY-mandated general education courses, distributed among nine knowledge and skill areas, must be completed as part of the degree. Seven of these knowledge and skills areas are met through specific required courses. The remaining two knowledge and skills areas must be chosen from a list of acceptable courses listed on the Registrar's web page:

- The Arts
- Other World Civilizations

Although it is usually expected that the SUNY-mandated general education courses will be taken in the freshman or sophomore years, it is possible to take several of these courses in either the junior or senior year. However, be sure to discuss the ramifications of such a delay with your advisor.

### **Transfer Entry Program**

Students preparing to transfer to ESF with full junior status must have earned at least 60 credits of college course work. The sample courses listed above represent the type of course requirements for students admitted to ESF's Syracuse campus programs as transfers.

***Junior and Senior Courses***

Coursework taken in the Junior and Senior years is usually a combination of courses from the professional education core and technical electives. Technical electives may be chosen to allow the student to either broaden their education in forest management or to concentrate in a particular component of forest resources management. The following sample schedule of courses is appropriate for students that enter the program as either a freshman or as a transfer student.

<b>Sample Sophomore/Junior Year - Summer Semester at Wanakena</b>		
<b>Course</b>		<b>Cr. Hr.      Check           Off</b>
FOR304	Adirondack Field Studies	4
<b>TOTAL</b>		<u>4</u>

<b>Sample Junior Year - Fall Semester</b>		
<b>Course</b>		<b>Cr. Hr.      Check           Off</b>
FOR322	Forest Mensuration	3
FOR334	Silviculture	4
FOR345	Introduction to Soils	3
FOR360	Principles of Management	3
FOR402	Professional Forestry Mentoring Program	1
	Free Elective	3
<b>TOTAL</b>		<u>17</u>

<b>Sample Junior Year - Spring Semester</b>		
<b>Course</b>		<b>Cr. Hr.      Check           Off</b>
ESF300	Introduction to Geospatial Information Technologies	3
FOR323	Forest Biometrics	3
FOR333	Natural Resources Managerial Economics	3
FOR370	Forest Management Decision Making and Planning	3
FOR372	Fundamentals of Outdoor Recreation	3
<b>TOTAL</b>		<u>15</u>

<b>Sample Senior Year - Fall Semester</b>			
<b>Course</b>		<b>Cr. Hr.</b>	<b>Check Off</b>
FOR373	Forest Operations	3	_____
FOR465	Natural Resources Policy	3	_____
	Free Elective	3	_____
	Technical Elective <sup>2</sup>	3	_____
	Technical Elective <sup>2</sup>	3	_____
<b>TOTAL</b>		<u>15</u>	<u>_____</u>

<b>Sample Senior Year - Spring Semester</b>			
<b>Course</b>		<b>Cr. Hr.</b>	<b>Check Off</b>
FOR490	Integrated Resources Management	3	_____
	Free Elective	3	_____
	Technical Elective <sup>2</sup>	3	_____
	Technical Elective <sup>2</sup>	3	_____
	Technical Elective <sup>2</sup>	3	_____
<b>TOTAL</b>		<u>15</u>	<u>_____</u>

<sup>2</sup> Technical electives must include at least one course each in vegetation management, water resources, forest protection/health, wildlife management, and wood technology/science.

**Technical Electives**

Fifteen (15) technical elective hours are restricted to five resource areas: forest protection or health, vegetation management, water resources, wildlife management, and wood technology/science. Students must choose one course from each of these resource areas to meet graduation requirements. Courses that satisfy this requirement include the following (other courses may be substituted with an approved petition):

<b>Forest Protection/Health</b>			
<b>Course</b>			<b>Credits</b>
EFB340	Forest and Shade Tree Pathology	Spring	3
EFB351	Principles of Forest Entomology	Fall	3

<b>Vegetation Management</b>			
<b>Course</b>			<b>Credits</b>
FOR433	Silviculture Workshop	Spring	3
FOR481	Introduction to Arboriculture	Spring	3
FOR480	Urban Forestry	Spring	3

<b>Water Resources</b>			
<b>Course</b>			<b>Credits</b>
FOR340	Watershed Hydrology	Fall	3
FOR442	Watershed Ecology and Management	Fall	3

<b>Wildlife Management</b>			
<b>Course</b>			<b>Credits</b>
EFB390	Wildlife Ecology and Management	Fall	4
EFB413	Introduction to Conservation Biology	Spring	3
EFB487	Fisheries Science and Management	Fall	3
EFB493	Wildlife Habitats and Populations	Fall	4

<b>Wood Technology/Science</b>			
<b>Course</b>			<b>Credits</b>
CME376	Decay of Wood Products	Spring	3
CME387	Renewable Materials / Sustainable Constr.	Fall	3
CME400	Introduction to Forest Products	Spring	3
CME444	Materials Marketing	Fall	3

## Natural Resources Management

The Natural Resources Management program is based on a vision that combines professional competency in management skills with a strong foundation in the social and biophysical sciences. The program was constructed so that students would have the freedom to work in specialty areas associated with a minor from ESF or Syracuse University (see pages 30-32).

Students interested in this program typically are drawn to natural settings and environments, enjoy nature, and want to develop the professional knowledge and skills needed to conserve, steward and manage natural resources and the environment. ESF provides a wide variety of opportunities to meet student needs utilizing 25,000 acres of forestlands as teaching laboratories and college faculty in many natural resource management disciplines. Internships with natural resource-based organizations in the business, public and nonprofit sectors provide additional hands-on experiences. Experiential-field learning is combined with learning concepts and skills in the classroom and laboratory on ESF's Syracuse campus.

The Natural Resources Management program develops professional skills that employers tell us are the most important traits they look for in new employees. These traits are developed through a broad base of classes in the natural sciences, social sciences and humanities, communication, and quantitative and qualitative problem-solving skills. The majority of work scheduled during the first two years (lower division) is in these areas. This major prepares students to be well-rounded natural resources managers.

Natural Resources Management offers a wide variety of employment opportunities. Our graduates are working throughout the United States in public agencies, private industry, and for nonprofit organizations. Their duties range from policy analysts for federal agencies to resource managers for non-profit organizations, from recreation planning for state park agencies to recreation management in federal wilderness areas, and from watershed hydrologists to land managers maintaining surface water quality.

### ***Program Requirements***

The Summer Program in Forest and Natural Resources Management is required for ALL students in Natural Resources Management (except those who attend the Forest Technology or Land Surveying Technology Programs at the Ranger School, Wanakena Campus). The Summer Program is a four-week session that begins at the end of May and lasts through June. It is taught at ESF's Wanakena Campus on Cranberry Lake. The program consists of one course: Adirondack Field Studies (FOR 304). The Summer Program is designed to be completed after the Sophomore year and should be completed before Junior year.

Students have expectations of the Natural Resources Management program and its faculty, and the faculty has expectations of the students as well. Students are expected to enter their junior year with the ability to write and speak clearly. Work should be presented in a professional manner, and criticism should be given and accepted in this same spirit. Students are expected to understand and use computers, including word processing of manuscripts, spreadsheets with functions, and basic database management. Students should be active learners who are mature and want to develop professional judgment for conducting and supervising field and office operations.

***Avenues for Completion***

Students may follow one of three “paths” to enter and complete the natural resources management program:

1. The “freshman” path is for students who enter ESF as a freshman and complete all degree requirements at ESF with the Summer Program in Forest and Natural Resources Management after the second year.
2. The “combined A.A.S/B.S.” path is for students who wish to have more field measurement and field problem solving skills and leadership development in context of forestry problems. The first year can be at ESF or another campus and the second year is spent at the Ranger School, Wanakena campus. Students then complete their B.S. degree requirements at ESF. This path can usually be completed in a total of four and one-half years.
3. The “transfer” path is for students who complete all or part of their lower division course work at another two or four-year campus, attend the Summer Program in Forest and Natural Resources the summer before entering ESF, and complete the upper-division requirements at ESF. Students preparing to transfer to ESF with full junior status must have earned at least 60 credits of college course work.

***Summary of General Education and Professional Education Core Requirements***

The undergraduate curriculum in Natural Resources Management consists of two broad categories of courses. The first category, general education, provides students with knowledge and skills that are useful and important for all educated persons regardless of their profession as well as preparation for advanced courses leading to a specific profession. The second category, professional courses, provides students with direct preparation for a career.

<b>GENERAL EDUCATION CORE</b>	<b>CREDITS</b>
American History	3
Western Civilization	3
Other World Civilizations	3
The Arts	3
Probability and Statistics	3
Principles of Management	3
Economics	3
Information Literacy	1
English with a focus on Writing	3
Humanities	3
Biology I and II (w/laboratory)	8
Chemistry I and Chemistry II or Physics	8
<b>Physics</b>	4
Precalculus	3
Public Speaking	3
General or Field Ecology (w/laboratory)	4
Sociology or Psychology	3
<b>Minimum credit hours</b>	<b>57</b>

<b>PROFESSIONAL EDUCATION CORE</b>	<b>CREDITS</b>
Orientation Seminar: Forest and Natural Resources Mgt.	1
Adirondack Field Studies	4
Introduction to Geospatial Information Technologies	3
Introduction to Soils	3
Watershed Hydrology	3
Forest Ecology and Silviculture	3
Managerial Economics for Environmental Professionals	3
Fundamentals of Outdoor Recreation	3
Natural Resources Policy	3
Writing for Scientific Professionals	3
Integrated Resources Management	3
Accounting or Finance Directed Elective	3
Wildlife or Fisheries Directed Elective	3
Human Dimensions Directed Elective	3
Policy Directed Elective	3
<b>Minimum core credit hours</b>	<b>44</b>
Free electives	21
<b>Total required for graduation</b>	<b>122</b>

## Undergraduate Program Requirements

### Freshman and Sophomore Courses

Students may be admitted directly as first-year freshman students at ESF, or through a variety of transfer options. Regardless of which way students enter ESF, they must complete both the general and professional education requirements.

At least 27 credits in SUNY-mandated general education courses, distributed among nine knowledge and skill areas, must be completed as part of the degree. To meet degree requirements, students must successfully complete all lower- and upper-division courses. The following are lower division requirements presented in sample schedules for first-year students and transfer students at ESF.

### First-Year Freshmen at ESF

Below is a sample schedule of courses for students admitted to ESF's Syracuse campus programs as first-year freshmen.

Sample Freshman Year - Fall Semester			
Course		Cr. Hr.	Check Off
FOR132	Orientation Seminar: Forest and Natural Resources Mgt. <sup>1</sup>	1	_____
EWP190	Writing and the Environment (Gen. Ed. Communication)	3	_____
EFB101/102	General Biology I and Lab (Gen. Ed. Natural Sciences)	4	_____
FCH150/151	General Chemistry Lecture I and Lab	4	_____
APM104	College Algebra and Pre-calculus (Gen. Ed. Math)	3	_____
TOTAL		15	_____

Sample Freshman Year - Spring Semester			
Course		Cr. Hr.	Check Off
EFB103/104	General Biology II and Lab	4	_____
	General Chemistry II w/Lab or General Physics*	4	_____
	GenEd Course <sup>3</sup>	3	_____
	GenEd Course <sup>3</sup>	3	_____
ESF200	Information Literacy	1	_____
TOTAL		14	_____

\*EFB200 *Physics of Life* can be substituted for General Physics, but students are held to the 1-credit hour lab as a free elective

Sample Sophomore Year - Fall Semester			
Course		Cr. Hr.	Check Off
CMN220	Public Presentation Skills for Env. Professionals	3	_____
EFB320	General Ecology	4	_____
FOR207	Introduction to Economics (Gen. Ed. Social Science)	3	_____
FOR360	Principles of Management	3	_____
	GenEd Course <sup>3</sup>	3	_____
	TOTAL	16	_____

Sample Sophomore Year - Spring Semester			
Course		Cr. Hr.	Check Off
APM391	Introduction to Probability and Statistics	3	_____
	Sociology or Psychology <sup>2</sup>	3	_____
	GenEd Course <sup>3</sup>	3	_____
	GenEd Course <sup>3</sup>	3	_____
	TOTAL	13	_____

<sup>1</sup> All students (freshmen and transfers) must take FOR 132: Orientation Seminar in FNRM

<sup>2</sup> FOR 202: Introduction to Sociology (3) or SOC 101: Introduction to Sociology (3) or PSY 205: Foundations of Human Behavior

<sup>3</sup> See "General Education Requirements" section below.

### ***General Education Requirements***

At least 27 credits in SUNY-mandated general education courses, distributed among nine knowledge and skill areas, must be completed as part of the degree. Four of these knowledge and skills areas are met through specific required courses. The remaining five knowledge and skills areas, noted with a <sup>2</sup> in the tables above must be chosen from a list of acceptable courses listed on the Registrar's web page:

American History  
The Arts  
Other World Civilizations  
Western Civilization  
Humanities

While the SUNY General Education requirements allow students to meet the social science requirement by completing the introductory economics course, the NRM degree requires an additional social science course, as noted with a <sup>2</sup> in the tables above. To meet this added social science requirement, students should choose one of the three courses listed above, or by petition a course from one of the following subject areas:

Government  
Political theory  
Public policy

Although it is usually expected that the SUNY-mandated general education courses will be taken in the freshman or sophomore years, it is possible to take several of these courses in either their junior or senior year. However, be sure to discuss the ramifications of such a delay with your advisor.

### Transfer Entry Program

Students preparing to transfer to ESF with full junior status must have earned at least 60 credits of college course work. The sample courses listed above represent the type of course requirements for students admitted to ESF's Syracuse campus programs as transfers.

### Junior and Senior Courses

Coursework taken in the Junior and Senior years is usually a combination of courses from the professional education core and free electives. The following sample schedule of courses is appropriate for students that enter the program as either a freshman or as a transfer student.

Sample Sophomore/Junior Year - Summer Semester			
Course		Cr. Hr.	Check Off
FOR304	Adirondack Field Studies	4	
TOTAL		4	

Sample Junior Year - Fall Semester			
Course		Cr. Hr.	Check Off
FOR345	Introduction to Soils	3	
FOR340	Watershed Hydrology	3	
FOR321	Forest Ecology and Silviculture	3	
	Accounting or Finance Directed Elective <sup>1</sup>	3	
	Free Elective	3	
TOTAL		15	

Sample Junior Year - Spring Semester			
Course		Cr. Hr.	Check Off
ESF300	Introduction to Geospatial Information Technologies	3	
FOR333	Managerial Economics for Environmental Professionals	3	
FOR372	Fundamentals of Outdoor Recreation	3	
	Wildlife or Fisheries Directed Elective <sup>2</sup>	3	
	Free Elective	3	
TOTAL		15	

<b>Sample Senior Year - Fall Semester</b>		
<b>Course</b>	<b>Cr. Hr.</b>	<b>Check Off</b>
FOR465 Natural Resources Policy	3	_____
EWP405 Writing for Scientific Professionals	3	_____
Human Dimensions Directed Elective <sup>3</sup>	3	_____
Free Elective	3	_____
Free Elective	3	_____
<b>TOTAL</b>	<b>15</b>	_____

<b>Sample Senior Year - Spring Semester</b>		
<b>Course</b>	<b>Cr. Hr.</b>	<b>Check Off</b>
FOR490 Integrated Resources Management	3	_____
Policy Directed Elective <sup>4</sup>	3	_____
Free Elective	3	_____
Free Elective	3	_____
Free Elective	3	_____
<b>TOTAL</b>	<b>15</b>	_____

<sup>1</sup> ACC201: Introduction to Accounting for Non-Management Students (3) (Fall/Spring) or  
FIN301: Finance for Non-Management Students (Fall/Spring)

<sup>2</sup> EFB390: Wildlife Ecology and Management (4) (Spring) or  
EFB487: Fisheries Science and Management (3) (Fall) or  
EFB493: Wildlife Habitats and Populations (4) (Fall)

<sup>3</sup> EST390: Social Processes and the Environment (3) (Fall/Spring) or  
FOR312: Sociology of Natural Resources (3) (Spring)

<sup>4</sup> FOR485: Business and Managerial Law (3) (Spring) or  
FOR487: Environmental Law and Policy (3) (Fall) or  
FOR489: Natural Resources Law and Policy (3) (Spring)

## Forest Ecosystem Science

The Bachelor of Science degree program in Forest Ecosystem Science (FES) is based on a vision that combines professional competency in forest management skills with an enhanced understanding of ecological sciences. Students interested in this program typically are drawn to natural settings and environments, enjoy nature, and want to understand how forested ecosystems work. ESF provides a wide variety of opportunities to meet student needs utilizing 25,000 acres of forest lands as teaching laboratories. Internships with natural resource-based organizations in the business, public and nonprofit sectors provide additional hands-on experiences. Experiential-field learning is combined with learning concepts and skills in the classroom and laboratory on ESF's Syracuse campus.

The FES program allows students to obtain the professional skills that employers look for in new employees and a deeper understanding of the scientific basis of those skills. These skills are developed through a combination of core courses focusing on biology, ecology, ecosystems, and management. The forest ecosystem science degree offers a wide variety of employment opportunities. Graduates work throughout the United States in public agencies, private industry, and for nonprofit organizations. They also are well prepared to enter graduate programs in management of forest and natural resources, ecological research, or other areas of applied forest biology.

Forest ecosystem science offers a wide variety of employment opportunities. Graduates work throughout the United States in public agencies, private industry, and for nonprofit organizations. They also are well prepared to enter graduate programs in management of natural resources, ecological research, or other areas of applied forest biology.

### ***Program Requirements***

The Summer Program in Forest and Natural Resources Management is required for ALL students in Forest Ecosystem Science (except those who attend the Forest Technology or Land Surveying Technology Programs at the Ranger School, Wanakena Campus). The Summer Program is a four-week session that begins at the end of May and lasts through June. It is taught at ESF's Wanakena Campus on Cranberry Lake. The program consists of one course: Adirondack Field Studies (FOR 304). The Summer Program is designed to be completed after the Sophomore year and must be completed before Junior year.

Students have expectations of the Forest Ecosystem Science program and its faculty, and the faculty has expectations of the students as well. Students are expected to enter their junior year with the ability to write and speak clearly. Work should be presented in a professional manner, and criticism should be given and accepted in this same spirit. Students are expected to understand and use computers, including word processing of manuscripts, spreadsheets with functions, and basic database management. Students should be active learners who are mature and want to develop professional judgment for conducting and supervising field and office operations.

***Program Admission***

Students may follow one of three paths to enter and complete the forest ecosystem science degree program:

1. The freshman path is for students who enter ESF as freshmen and complete all degree requirements at ESF with the Summer Program in Forest and Natural Resources after the first or second year (first year preferred).
2. The combined A.A.S/B.S. path is for students who wish to have more field measurement and field problem solving skills and leadership development in context of forestry problems. The first year can be at ESF or another campus and the second year is spent at the Ranger School on the Wanakena campus. Students then complete their B.S. degree requirements at ESF. This path can usually be completed in a total of four and one-half years.
3. The transfer path is for students who complete all or part of their lower-division coursework at another two- or four-year campus, attend the Summer Program in Forest and Natural Resources the summer before entering ESF, and complete the upper-division requirements at ESF. Students preparing to transfer to ESF with full junior status must have earned at least 60 credits of college coursework.

***Summary of General Education and Professional Education Core Requirements***

The undergraduate curriculum in Forest Ecosystems Science consists of two broad categories of courses. The first category, general education, provides students with knowledge and skills that are useful and important for all educated persons regardless of their profession as well as preparation for advanced courses leading to a specific profession. The second category, professional courses, provides students with direct preparation for a career. The first two years of college usually focuses on general education and the second two on the professional studies.

<b>GENERAL EDUCATION CORE</b>	<b>Credits</b>
American History	3
Western Civilization	3
Introduction to Probability & Statistics	3
Principles of Management	3
Economics	3
Information Literacy	1
English with a focus on Writing I & II	6
Humanities (fulfilled through writing course, EWP290)	-
Biology (w/laboratory)	8
Chemistry I & II (w/laboratory)	8
Physics (w/laboratory)	4
Calculus I	4
<b>Minimum Credit Hours</b>	<b>46</b>

<b>PROFESSIONAL EDUCATION CORE</b>	<b>CREDITS</b>
Orientation Seminar: Forest and Natural Resources Mgt.	1
Adirondack Field Studies	4
Dendrology	3
Natural Resources Ecology	3
Introduction to Geospatial Information Technologies	3
Silviculture	4
Forest Ecology	3
Introductory Soils	3
Forest Mensuration	3
Forest Biometrics	3
Natural Resources Policy	3
Integrated Resources Management	3
Biology Electives	9
Ecology & Ecosystems Electives	9
Management & Human Dimensions Electives	9
<b>Minimum Credit Hours</b>	<b>58</b>
Free Electives	15
<b>Total Required for Graduation</b>	<b>124</b>

### ***Undergraduate Program Requirements***

#### ***Freshman and Sophomore Courses***

Students may be admitted directly as first-year freshman students at ESF or through a variety of transfer options. Regardless of which way students enter ESF, they must complete both the general and professional education requirements.

At least 27 credits in SUNY-mandated general education courses, distributed among nine knowledge and skill areas, must be completed as part of the degree. To meet degree requirements, students must successfully complete all lower- and upper-division courses. The following are lower division requirements presented in sample schedules for first-year students and transfer students at ESF.

**First-Year Freshmen at ESF**

Below is a sample schedule of courses for students admitted to ESF's Syracuse campus programs as first-year freshmen.

<b>Sample Freshman Year - Fall Semester</b>			<b>Cr.</b>	<b>Check</b>
<b>Course</b>			<b>Hr.</b>	<b>Off</b>
FOR132	Orientation Seminar: Forest and Natural Resources Mgt. <sup>1</sup>		1	_____
APM105	Survey of Calculus I (Gen. Ed. Math)		4	_____
EWP190	Writing and the Environment (Gen. Ed. Communication)		3	_____
EFB101/102	General Biology I and Lab (Gen. Ed. Natural Sciences)		4	_____
FCH150/151	General Chemistry Lecture I and Lab		4	_____
<b>TOTAL</b>			<b>16</b>	_____

<b>Sample Freshman Year - Spring Semester</b>			<b>Cr.</b>	<b>Check</b>
<b>Course</b>			<b>Hr.</b>	<b>Off</b>
EFB103/104	General Biology II and Lab		4	_____
FCH152/153	General Chemistry Lecture II and Lab		4	_____
ESF200	Information Literacy		1	_____
FOR207	Introduction to Economics (Gen. Ed. Social Science)		3	_____
FOR232	Natural Resources Ecology		3	_____
<b>TOTAL</b>			<b>15</b>	_____

<b>Sample Sophomore Year - Fall Semester</b>			<b>Cr.</b>	<b>Check</b>
<b>Course</b>			<b>Hr.</b>	<b>Off</b>
FOR332	Forest Ecology		3	_____
FOR360	Principles of Management		3	_____
PHY211/221	General Physics I*		4	_____
	Biology Elective <sup>3</sup>		3	_____
	General Education Course <sup>2</sup>		3	_____
<b>TOTAL</b>			<b>16</b>	_____

\*EFB200 *Physics of Life* can be substituted for General Physics, but students are held to the 1-credit hour lab as a free elective

<b>Sample Sophomore Year - Spring Semester</b>			<b>Cr.</b>	<b>Check</b>
<b>Course</b>			<b>Hr.</b>	<b>Off</b>
APM391	Introduction to Probability and Statistics		3	_____
EWP290	Writing, Humanities and the Environment (Gen. Ed. Humanities)		3	_____
	General Education Course <sup>2</sup>		3	_____
	Biology Elective <sup>3</sup>		3	_____
<b>TOTAL</b>			<b>15</b>	_____

<sup>1</sup> All students (freshmen and transfers) must take FOR 132.

<sup>2</sup> See "General Education Courses" on next page.

<sup>3</sup> See "Directed Elective Courses" on page 29.

**General Education Courses**

At least 27 credits in SUNY-mandated general education courses, distributed among seven knowledge and skill areas, must be completed as part of the degree. Five of these knowledge and skills areas are met through specific required courses. The remaining two knowledge and skills areas, noted with a <sup>2</sup> in the tables above must be chosen from a list of acceptable courses listed on the Registrar's web page:

American History  
Western Civilization

Although it is usually expected that the SUNY-mandated general education courses will be taken in the freshman or sophomore years, it is possible to take several of these courses in either the junior or senior year. However, be sure to discuss the ramifications of such a delay with your advisor.

**Transfer Entry Program**

Students preparing to transfer to ESF with full junior status must have earned at least 60 credits of college course work. The sample courses listed above represent the type of course requirements for students admitted to ESF's Syracuse campus programs as transfers.

**Junior and Senior Courses**

Coursework taken in the Junior and Senior years is usually a combination of courses from the professional education core and technical electives. Technical electives may be chosen to allow the student to either broaden their education in forest management or to concentrate in a particular component of forest science. The following sample schedule of courses is appropriate for students that enter the program as either a freshman or as a transfer student.

<b>Sample Sophomore Year - Summer Semester</b>			
<b>Course</b>		<b>Cr. Hr.</b>	<b>Check Off</b>
FOR304	Adirondack Field Studies	4	_____
TOTAL		4	_____

<b>Sample Junior Year - Fall Semester</b>			
<b>Course</b>		<b>Cr. Hr.</b>	<b>Check Off</b>
EFB336	Dendrology	3	_____
FOR322	Forest Mensuration	3	_____
FOR334	Silviculture	4	_____
FOR345	Introduction to Soils	3	_____
	Biology Elective <sup>3</sup>	3	_____
TOTAL		16	_____

<b>Sample Junior Year - Spring Semester</b>		
<b>Course</b>	<b>Cr. Hr.</b>	<b>Check Off</b>
FOR323 Forest Biometrics	3	_____
ESF300 Introduction to Geospatial Information Technologies	3	_____
Free Elective	3	_____
Ecosystems/Ecology Elective <sup>4</sup>	3	_____
Management/Human Dimensions Elective <sup>5</sup>	3	_____
<b>TOTAL</b>	<u>15</u>	<u>_____</u>

<b>Sample Senior Year - Fall Semester</b>		
<b>Course</b>	<b>Cr. Hr.</b>	<b>Check Off</b>
FOR465 Natural Resources Policy	3	_____
Ecosystems/Ecology Elective <sup>4</sup>	3	_____
Management/Human Dimensions Elective <sup>5</sup>	3	_____
Free Elective	3	_____
Free Elective	3	_____
<b>TOTAL</b>	<u>15</u>	<u>_____</u>

<b>Sample Senior Year - Spring Semester</b>		
<b>Course</b>	<b>Cr. Hr.</b>	<b>Check Off</b>
FOR490 Integrated Resources Management	3	_____
Management/Human Dimensions Elective <sup>5</sup>	3	_____
Ecosystems/Ecology Elective <sup>4</sup>	3	_____
Free Elective	3	_____
Free Elective	3	_____
<b>TOTAL</b>	<u>15</u>	<u>_____</u>

<sup>3</sup> See “Biology Electives” on page 29.

<sup>4</sup> See “Ecosystems/Ecology Electives” on page 30.

<sup>5</sup> See “Management/Human Dimensions Electives” on page 31.

**Directed Elective Courses**

Students must choose three courses from each of these three directed elective areas to meet graduation requirements. Courses that satisfy this requirement include the following (other courses may be substituted with an approved petition):

<sup>3</sup> <b>Biology Electives</b> (chose at least 9 credits)			
<b>Course</b>			<b>Credits</b>
<b>Biology courses</b>			
EFB307/308	Principles of Genetics with Lab	Fall	4
EFB311	Principles of Evolution	Spring	3
EFB325	Cell Physiology	Spring	3
EFB409	Molecular Basis of Evolution	Unknown	3
EFB444	Biodiversity and Geography of Nature	Fall	3
<b>Forest Health Science and Protection courses</b>			
EFB303	Introductory Environmental Microbiology	Fall	4
EFB340	Forest and Shade Tree Pathology	Spring	3
EFB342	Fungal Diversity and Ecology	Summer	3
EFB345	Forest Health	Summer	3
EFB351	Forest Entomology	Fall	3
EFB352	Entomology	Fall	3
EFB400	Toxic Health Hazards	Fall	3
EFB439	Forest Health Monitoring	Spring	3
EFB440	Mycology	Fall	3
EFB443	Plant Virology	Spring	3
EFB554	Aquatic Entomology	Fall	3
EFB570	Insect Physiology	Spring	3
<b>Plant Biology/Science courses</b>			
EFB326	Diversity of Plants	Spring	3
EFB327	Adirondack Flora	Summer	3
EFB337	Field Ethnobotany	Summer	3
EFB427	Plant Development Biology	Fall	3
EFB526	Introduction to Plant Tissue Culture	Spring	3
EFB 530/531	Plant Physiology / Lab	Spring	5
EFB535	Flowering Plants: Diversity, Evolution and Sys.	Fall	3
<b>Animal Biology/Science courses</b>			
EFB355	Invertebrate Zoology	Spring	4
EFB384	Field Herpetology	Summer	3
EFB385	Comparative Vertebrate Anatomy	Spring	4
EFB388	Ecology of Adirondack fishes	Summer	3
EFB424	Limnology: Study of Inland Waters	Fall	3
EFB462	Animal Physiology: Environmental and Ecol.	Fall	3
EFB480	Principles of Animal Behavior	Spring	4
EFB482	Ornithology	Fall	4
EFB483	Mammal Diversity	Spring	4
EFB484	Mammalian Winter Ecology	Spring	3

EFB485	Herpetology	Fall	3
EFB486	Ichthyology	Spring	3
EFB491	Applied Wildlife Science	Spring	3
EFB493	Wildlife Habitats and Populations	Fall	4

<sup>4</sup> Ecosystems/Ecology Electives (chose at least 9 credits)			
Course			Credits
EFB320	General Ecology	Fall	4
EFB412	Introduction to Chemical Ecology	Spring	3
EFB413	Introduction to Conservation Biology	Spring	3
EFB415	Ecological Biogeochemistry	Fall	3
EFB423	Marine Ecology	Spring	4
EFB428	Mycorrhizal Ecology	Fall	3
EFB445	Plant Ecology and Global Change	Spring	3
EFB446	Ecology of Mosses	Spring	3
EFB502	Ecology and Management of Invasive Species	Fall	3
EFB505	Microbial Ecology	Spring	2
EFB516	Ecosystems	Spring	3
EFB518	Systems Ecology	Fall	3
EFB522	Biophysical Economics	Spring	3
EFB555	Chemical Ecology of Vertebrates	Fall/Spring	3
FOR338	Meteorology	Fall	3
FOR340	Watershed Hydrology	Fall	3
FOR443	Forest Hydrology	Fall	3
FOR523	Tropical Ecology	Spring	3

<sup>5</sup> Management and Human Dimensions Electives (chose at least 9 credits)			
Course			Credits
<b>Management courses</b>			
EFB390	Wildlife Ecology and Management	Fall	4
EFB487	Fisheries Science and Management	Fall	3
FOR333	Managerial Economics for Env. Professionals	Spring	3
FOR370	Forest Mgt Planning and Decision Making	Spring	3
FOR373	Forest Operations	Fall	3
FOR433	Silviculture Workshop	Spring	3
FOR442	Watershed Ecology and Management	Fall	3
FOR460	Managing Vegetation Using IPM	Spring	3
FOR478	Wilderness and Wildlands Management	Fall	3
FOR480	Urban Forestry	Spring	3
FOR481	Introduction to Arboriculture	Spring	3
FOR513	Adirondack Forest Ecology and Management	Sum	2-3
<b>Human Dimensions courses</b>			
EST366	Attitudes, Values and the Environment	Fall	3
EST390	Social Processes and the Environment	Spring	3
FOR312	Sociology of Natural Resources	Spring	3
FOR372	Fundamentals of Outdoor Recreation	Spring	3
FOR475	Human Behavior and Recreation Visitor Mgt.	Spring	3

## Undergraduate Minors

### ***Syracuse University and SUNY-ESF Minors***

There are a growing set of minors available to SUNY-ESF students from both SU and ESF, including the following (see College Catalog for more information): computer and information technology (SU); entrepreneurship, management studies, and marketing (SU); and urban environmental science (ESF). The Department of Forest and Natural Resources Management sponsors three minors: recreation resources and protected area management; forestry (not available to forest resources management students) and water resources.

#### ***Applied Statistics Minor***

This minor provides students with an opportunity to extend their understanding of and ability to apply statistical methods beyond the basic techniques presented in introductory courses. The minor is intended to provide students with a strong background in statistical design (both sampling design and experimental design) and analysis. The 12-credit minor consists of two required courses (6 credits), APM 391 (or APM 395) and FOR 323 and 6 credits of directed electives of advanced courses, independent study, or teaching experience related to applied statistics.

This minor requires 12 credits and includes the required courses (6 credits) and directed electives (6 credits) listed below. Other applied statistics courses may be substituted by petition for any course in the directed elective list with the approval of the FNRM Undergraduate Education Committee.

Required Courses (6 credits)

- APM391 Introduction to Probability and Statistics (3), or  
APM395 Introduction to Statistics in Engineering (3) (Cannot use both)
- FOR323 Forest Biometrics (3)

Choose from the following directed electives (6 credits)

- APM620 Experimental Design and Analysis of Variance (3)
- APM625 Sampling Methods (3)
- FOR495 Undergraduate Teaching Assistance (associated with APM 391 or FOR323) (1)
- FOR498 Independent Study (guidance of instructor of APM applied statistics courses) (2-3)

Students from all programs at ESF are eligible for this minor if they have a cumulative grade point average of 3.00 or better after one semester at ESF (or as a transfer student with same standing). Permission of the Forest & Natural Resources Management Chair and Undergraduate Education Coordinator (via petition) is required.

#### ***Forestry Minor***

The minor in Forestry draws from the biological, physical, social, and managerial sciences. The curriculum aids in understanding the biological complexities of the forest and the interactions between the forest and social and economic demands. The minor is designed to provide students with an appreciation of forest resources management. Course themes include forest measurements, forest ecology, forest management and silviculture, and forest policy and

economics. The minor in Forestry includes courses taught at ESF in the Department of Forest and Natural Resources Management (FNRM); required course prerequisites are in both FNRM and Environmental and Forest Biology. It is the responsibility of the student to meet any prerequisites associated with courses in the minor.

Required courses (16 credit hours):

- FOR322 Forest Mensuration (3);
- FOR323 Forest Ecology (3);
- FOR334 Silviculture (4);
- FOR370 Forest Mgt. Decision Making & Planning (3) or FOR 373 Forest Operations (3);
- FOR333 Natural Res. Managerial Economics (3) or FOR 465 Natural Resources Policy (3).

Admission to the minor requires students to have a cumulative grade point average of 2.750 or better after one semester at ESF (or as a transfer student with same standing), and permission of the Forest & Natural Resources Management Chair and Undergraduate Education Coordinator (via petition).

### ***Recreation Resource and Protected Area Management Minor***

This minor provides students with an opportunity to combine visitor management with protected area management. Protected area managers need to be able to manage natural resources and a wide variety of users (e.g., campers, hikers, bird watchers, boaters, nature photographers and others who enjoy nature-based experiences), while working in diverse protected area environments owned by public agencies, private landowners, and non-governmental organizations. Completing an independent study or internship as part of this minor will give students hands-on experience in the field of recreation resources and protected area management. Students who complete this minor will better understand the motivations, preferences, and behaviors of recreational users; the environmental, social, and economic impacts resulting from natural resource use; and the balance needed between recreation and sustaining the natural resources within protected areas.

This interdisciplinary minor requires 15 credits and includes the following courses taught at ESF in the Departments of Forest and Natural Resources Management and Environmental and Forest Biology:

Required Courses (9 credits)

- EFB416 Introduction to Environmental Interpretation (3), or EFB521 Principles of Interpretive Programming (3);
- FOR372 Fundamentals of Outdoor Recreation (3);
- FOR475 Human Behavior and Recreation Visitor Management (3);

Required independent study or internship (3 credits)

- FOR 498 Section 20, or FOR 499 Section 20, or EFB 420 Section 28

One of the following management/protected area courses (3 credits)

- EFB413 Introduction to Conservation Biology (3)
- EFB496 Landscape Ecology (3)
- FOR403 Humans and the Environment: New Zealand (4)
- FOR476 Ecotourism and Nature Tourism (3)
- FOR478 Wilderness and Wildlands Management (3)
- FOR523 Tropical Ecology (3)

Students from all programs at ESF are eligible for this minor if they have completed a general ecology course and have a cumulative grade point average of 2.750 or better in their major program of study after one semester at ESF (or as a transfer student with same standing).

Overlap between the minor and both one required course and one directed elective for a student's major is permitted; other courses taken for the minor can not overlap with the major. Permission of the Forest & Natural Resources Management Chair and Undergraduate Education Coordinator via petition) is required.

### ***Urban Forestry Minor***

The Urban Forestry minor will provide students with the opportunity to better understand complex human-dominated ecosystems where trees and people coexist in close proximity. Understanding and attempting to manage this complexity requires a basic knowledge of plant physiology, nutrition, and tending at the individual tree level (Arboriculture). In addition, the urban forester also must understand the changing dynamic of groups of trees and the effects of those trees on numerous ecosystem services and human health and well-being in a city (Urban Forestry). Because human activity is so dominant in the urban ecosystem, it is essential that the urban forester have some understanding of ecological interactions and human motivations for sustaining and maintaining existing trees (Urban Ecology). The courses listed below will provide the professional knowledge required for careers in these and related fields.

Required courses (15 credit hours):

- ESF300 Introduction to Geospatial Information Technologies (3);
- EST220 Urban Ecology (3);
- FOR480 Urban Forestry (3);
- FOR481 Introduction to Arboriculture (3); and
- LSA480 Seminar in Urban Design (3)

The interdisciplinary minor includes courses taught at ESF in the Departments of Forest & Natural Resources Management, Environmental Studies, and Landscape Architecture.

Admission to this minor requires students to have (1) completed a general ecology course (e.g. EFB 320 General Ecology), (2) a cumulative grade point average of 2.750 or greater after one semester at ESF (or as a transfer student with the same GPA), and (3) permission of the Forest & Natural Resources Management Chair and the Undergraduate Education Coordinator (via petition).

### ***Water Resources Minor***

Water resources is a multi-disciplinary field that integrates the physical, geochemical and biological processes of the water cycle and their application to management of water resources, water policy, and human dimensions of water quality and quantity. The interdisciplinary minor

in water resources is designed as a flexible program for undergraduate students to study and integrate principles of physical hydrology, geochemistry, aquatic and terrestrial ecology, natural resources management, and environmental policy. This interdisciplinary minor can include SUNY ESF courses in the Departments of Forest and Natural Resources Management, Environmental Resources and Forest Engineering, Environmental and Forest Biology, Chemistry, and Environmental Studies, as well as courses at Syracuse University in relevant departments including Earth Sciences, Geography, Civil and Environmental Engineering, and Biology. The minor comprises 15 credit hours total, including one required course, FOR 442 Watershed Ecology and Management (3). The remaining twelve units must be taken from a list of approved elective courses in at least two separate departments. Admission to this minor requires that a student from any ESF program has a cumulative grade point average of 2.750 or better after one semester at ESF (or as a transfer student with same GPA), and has permission of the Forest and Natural Resources Management Chair and Undergraduate Education Coordinator using a standard petition. Students are responsible for meeting the prerequisite requirements for individual courses, as applicable.

Core course:

FOR 442 Watershed Ecology and Management (3)

Approved elective courses are:

CIE471 Environmental Chemistry (3, at SU)  
EFB415 Ecological Biogeochemistry (3)  
EFB423 Marine Ecology (4)  
EFB424 Limnology (3)  
EFB486 Ichthyology (3)  
EFB487 Fisheries Science and Management (3)  
EFB488 Fisheries Science Practicum (3)  
EFB496 Watershed Ecology with Focus on the Hudson River (2)  
EFB500 The Hudson River Watershed: Source to Sink in Eight Days (1-2)  
EFB525 Limnology Practicum (2)  
EFB554 Aquatic Entomology (3)  
ENS601 Water Resources Management  
ENS607 Wetland Practicum  
ERE440 Water Pollution Engineering (3)  
ERE445 Hydrologic Modeling (3)  
ERE496 River Form and Process (3)  
ERE548 Open Channel Hydraulics (3)  
ERE571 Fluid Mechanics (3)  
EST796 Human Dimensions of Water Problems  
EST625 Wetland Management Policy (3)  
EST628 Great Lakes Policy and Management (3)  
FEG340 Engineering Hydrology and Hydraulics (3)  
FCH510 Environmental Chemistry I (3)  
FCH515 Methods in Environmental Chemical Analysis (3)  
FOR338 Meteorology (3)  
FOR340 Watershed Hydrology (3)  
GEO316 River Environments (3, at SU)  
GOL400 Contaminant Hydrogeology (3, at SU)  
GOL400 Aqueous Geochemistry (3, at SU)  
GOL541 Hydrogeology (3, at SU)

## Combining Ranger School A.A.S. Diploma with a FNRM B.S. Degree

SUNY ESF Ranger School graduates who go on to pursue a bachelor's degree have a solid field education as well as a professional orientation. Students wishing to transfer from the Ranger School into either the FRM, or the NRM, or the FES programs are usually admitted as juniors. They will be given credit for the Summer Program and several other courses depending on the program pursued at the Range School and the program chosen at Syracuse. Each student must complete all physical sciences, social sciences and humanities requirements while at ESF in Syracuse. The number of courses taken depends on the student's prior preparations. All other requirements in the undergraduate degree programs must be met. The following tables illustrate how the Ranger School credits can be brought into the B.S. degree.

### Forest Technology A.A.S. to B.S. Program

R.S. Course #	FRM Program		NRM Program		FES Program	
	Equivalent BS Course #	Transfer Credits	Equivalent BS Course #	Transfer Credits	Equivalent BS Course #	Transfer Credits
FTC200(3)	<b>EFB336</b>	3	Free elec.	3	<b>EFB336</b>	3
FTC202(3)	Free elec.	3	Free elec.	3	Free elec.	3
FTC204(4)	<b>FOR304</b>	3	<b>FOR304</b>	3	<b>FOR304</b>	3
FTC206(4)	<b>FOR304</b>	1	<b>EFB320</b>	4	<b>FOR304</b>	1
	<b>FOR332</b>	3			<b>FOR332</b>	3
FTC208(3)	Free elec.	3	Free elec.	3	Free elec.	3
FTC210(3)	Free elec.	3	Free elec.	3	Free elec.	3
FTC211(4)	<b>Veg. Mgmt elec.</b>	3	<b>FOR304</b>	1	<b>Mgmt. elec</b>	3
	Free elec.	1	<b>FOR321</b>	3	Free elec.	1
FTC215(2)	Free elec.	2	Free elec.	2	Free elec.	2
FTC217(2)	Free elec.	2	--	--	Free elec.	2
FTC221(3)	Free elec.	3	Free elec.	3	<b>Mgmt. elec.</b>	3
FTC223(1)	Free elec.	1	Free elec.	1	Free elec.	1
FTC234(3)	<b>Wildlife elec.</b>	3	<b>Wildlife/Fish elec</b>	3	<b>Mgmt. elec.</b>	3
FTC238(3)	<b>Protection elec.</b>	3	Free elec.	3	<b>Bio. elec.</b>	3
<b>TOTAL</b>		<b>37</b>		<b>35</b>		<b>37</b>

### Land Surveying Technology A.A.S. to B.S. Program

R.S. Course #	FRM Program		NRM Program		FES Program	
	Equivalent BS Course #	Transfer Credits	Equivalent BS Course #	Transfer Credits	Equivalent BS Course #	Transfer Credits
FTC200(3)	<b>EFB336</b>	3	Free elec.	3	<b>EFB336</b>	3
FTC202(3)	Free elec.	3	Free elec.	3	Free elec.	3
FTC204(4)	<b>FOR304</b>	3	<b>FOR304</b>	4	<b>FOR304</b>	3
FTC206(4)	<b>FOR304</b>	1	<b>EFB320</b>	4	<b>FOR304</b>	1
	<b>FOR332</b>	3			<b>FOR332</b>	3
FTC210(3)	Free elec.	3	Free elec.	3	--	--
FTC225(3)	Free elec.	3	Free elec.	3	Free elec.	3
FTC251(5)	Free elec.	5	Free elec.	5	Free elec.	5
FTC253(3)	Free elec.	3	Free elec.	3	Free elec.	3
FTC255(2)	Free elec.	1	Free elec.	1	Free elec.	1
<b>TOTAL</b>		<b>28</b>		<b>29</b>		<b>25</b>

**Environmental and Natural Resources Conservation A.A.S. to B.S. Program**

R.S. Course #	FRM Program		NRM Program		FES Program	
	Equivalent BS Course #	Transfer Credits	Equivalent BS Course #	Transfer Credits	Equivalent BS Course #	Transfer Credits
FTC200(3)	<b>EFB336</b>	3	Free elec.	3	<b>EFB336</b>	3
FTC202(3)	Free elec.	3	Free elec.	3	Free elec.	3
FTC204(4)	<b>FOR304</b>	3	<b>FOR304</b>	3	<b>FOR304</b>	3
	--	--	Free elec.	1	--	--
FTC206(4)	<b>FOR304</b>	1	<b>EFB320</b>	4	<b>FOR304</b>	1
	<b>FOR332</b>	3	--	--	<b>FOR332</b>	3
FTC207(1)	Free elec.	1	Free elec.	1	Free elec.	1
FTC209(3)	Free elec.	3	Free elec.	3	Free elec.	3
FTC210(3)	Free elec.	3	Free elec.	3	Free elec.	3
FTC211(4)	<b>Veg. Mgmt elec.</b>	3	<b>FOR304</b>	1	<b>Mgmt. elec.</b>	3
	Free elec.	1	<b>FOR321</b>	3	Free elec.	1
FTC221(3)	Free elec.	3	Free elec.	3	<b>Mgmt. elec.</b>	3
FTC223(1)	Free elec.	1	Free elec.	1	Free elec.	1
FTC234(3)	<b>Wildlife elec.</b>	3	<b>Wildlife/Fish elec</b>	3	<b>Mgmt. elec.</b>	3
FTC237(3)	Free elec.	3	Free elec.	3	Free elec.	3
FTC238(3)	<b>Protection elec.</b>	3	--	--	<b>Bio. elec.</b>	3
FTC208(3)	<b>ESF300</b>	1	<b>ESF300</b>	1	<b>ESF300</b>	1
FTC239(2)		2		2		2
<b>TOTAL</b>		<b>40</b>		<b>38</b>		<b>40</b>

**For More Information Contact:**

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Undergraduate Studies Coordinator  
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## Appendices

## **Appendix A: Miscellany**

### ***Petitions***

The petition process exists to provide needed flexibility in the curriculum. Students often encounter situations that require minor adjustments from the academic requirements. As such, petitions at ESF generally handle two basic kinds of actions: (1) variances to degree requirements and (2) transfer of credit from another institution after the admissions process is completed. Petition forms are available from the Registrar's Office. Before completing a petition form, meet with your advisor. Many simple problems can be solved with a memo from the advisor to the Undergraduate Education Committee. Complete the petition forms legibly and clearly explain what you want to have happen. There are four parts of the petition form that must be completed:

***Informational heading.*** Be sure to provide all contact information requested and *sign* at the appropriate place. A petition that is missing this information can not be processed.

***Request.*** This should be clear and concise. What is the variance being requested? What specific course is being transferred? ... from which institution?

- Requests to substitute courses require the consent of the instructors.
- Often, the best way to fill out a petition is to write a simple memorandum and attach it to the petition form.

***Justification.*** This should be clear, logical, and detailed. You want to include a reasoned justification for the request. Explain the rationale for your request. Clarity is important, but more detail is better than less. It is important to remember that those acting on the petition will only see what you have written as a justification for your request. If the request is a variance, what are the circumstances? If a course transfer, what requirement is it meeting (how should it be slotted on the Plan Sheet)? Depending upon what is being petitioned, you will want to include additional information here:

- *Variances.* The student to obtain any additional items that are helpful - letters of support or explanation from relatives, doctors, instructors, etc. - and to attach them to the petition before the advisor signs the petition.
- *Course transfers.* The student must attach a description of the course, obtained from a catalog, or the WWW address. Exceptions include any course for which a transfer agreement has already been established (see below: such a listing should be noted on the petition).

***Signatures.*** Undergraduate petitions must be signed by the advisor, then brought to the Undergraduate Curriculum Coordinator (Dr. Chris Nowak) who signs and forwards it to the Department Chair (Dr. David Newman) and then to the Dean of Instruction and Graduate Study for final approval. The Dean may choose to consult with the Committee on Instruction (Academic Standards Subcommittee) before acting. If approved, the petition is forwarded to the Registrar, who makes the appropriate change in the record.

### ***More on Transferring Courses***

- *Transfer Articulation Guidelines (TAG)*. The Admissions Office maintains a listing of courses at articulating institutions that are predetermined to be acceptable substitutes for requirements in the various ESF curricula. The list (TAG-list) is available from the Admissions homepage, under *Cooperative Transfer Colleges*.
- *Grades do not transfer*. Credit can be transferred - if the grade is C or better - but the grade cannot, so it cannot affect the GPA.
- *Making up lower division deficiencies*. These should be satisfied as soon as possible, since they may be prerequisites for upper division classes or conflict with desired electives. Students should try to make up these classes (commonly organic chemistry, physics, and calculus) during the summer, at a local community college, if possible.
- *Petition courses before taking them*. Students should submit petitions *before* taking classes elsewhere. This way they know in advance if the course will transfer and meet the intended purpose.
- *Required upper division subjects* may be satisfied by acceptable lower division courses taken at another institution. Usually the transfer is handled at admission, but sometimes a course is named in a way that obscures its relationship to the FNRM curriculum, and a later petition is needed. Such courses are placed in the upper division of the Plan Sheet, in the appropriate slot.

### ***Late Adds, Late Drops***

After the add date, about 10 days into the semester, students must petition to add a class. By that time considerable material usually has been presented, and the instructor has the right to refuse admission; if the instructor approves, the petition is virtually always successful. Common late adds include research projects (FOR 498) or internships (Forestry 499) that are developed later in the semester.

In contrast, no petition is harder to get approved than one to drop a course after the drop deadline. Late drop petitions go automatically to the Academic Standards subcommittee, who look for some significant circumstance that occurred after the drop date (which is a couple months into the semester). Before filing such a petition, be sure you have read about the process on the Registrar's FAQ page (important enough to reproduce below).

***Guideline Criteria for Successful Late Drops.*** A petition must exhibit a clear and significant mitigating or extenuating circumstance outside of "normal" and predictable distractions from college coursework, etc. Examples might include illness, injury, death in the immediate family, financial emergency, and others.

The mitigating or extenuating circumstance must occur after or extend beyond the college designated "drop deadline".

The mitigating or extenuating circumstance must be clearly the result of actions outside the control of the student, i.e. not self-inflicted hardship. Similarly, if the student is innocently a victim of poor advising or administrative mishandling, justifiable grounds for the petition may be found

The clear message contained in these criteria should be "late drops are only justifiable under exceptional conditions." The drop deadline placed by the college (ESF, not SU - it differs in intent and date) is exactly that - normal drops are not accepted after that deadline. You may find it useful to see what is not appropriate as well as knowing what is.

The following are "typical" examples of petition justifications which would **not** be accepted:

- *student missed the "drop deadline" by accident*
- *student coursework load is too heavy*
- *student is failing the course*
- *student has missed too many classes or has fallen too far behind*
- *student has changed major and the course is not required in the new major*
- *student intends to retake the course later or at another college*
- *student gambles unsuccessfully in taking an exam or attempting a project on or after the drop deadline*

Two other points are of noteworthy consideration: first, a late change to "audit" a course is considered equivalent to dropping, and all the above criteria apply; second, a petition to late drop is not approved until final review by the Dean of Instruction and the Subcommittee on Academic Standards. Students petitioning for late drops should continue to attend class until they receive final notification of the subcommittee's action. Even if your advisor and instructor approve the petition, it is not a done deal.

### ***Incompletes***

A grade of "I" may be assigned only when the student is passing and has nearly completed the course, if the work is not completed because of circumstances beyond the student's control. The incomplete must be resolved prior to the end of the semester following the one in which the grade was given. It may be extended by one semester by petition with the consent of the instructor. If the incomplete is not resolved by the appropriate deadline it will be changed to a grade of "F".

### ***Taking a Course at another College after Matriculation at ESF***

Following matriculation at ESF, students who wish to take courses for credit at other colleges or universities (other than ESF or Syracuse University) must submit a petition prior to taking the course. If the petition is approved, the student must request the registrar at the other college send a transcript directly to the ESF Registrar. To receive credit, a grade of "C" or higher must be earned. Before taking the course the student should:

- Obtain a course description or syllabus and submit it with the petition.
- Have the instructor of the ESF course review the proposed substitution and write a brief memo evaluating its applicability.
- Obtain a signature from the faculty advisor on the petition.

### ***Taking Graduate Courses***

ESF courses numbered 500 and above are graduate courses. Undergraduate enrollment in these is governed as follows:

700-900 level classes - undergraduates are *absolutely excluded*

600-level classes - to enroll, undergraduates must have: 1) senior standing; 2) a GPA of 3.0 or better; and 3) an approved petition (at least pending at time of registration) showing instructor consent (this consent also needs to be indicated on the SCORE form).

500-level classes - according to written ESF academic policy, instructor permission is required. This may be ignored by faculty members and the Registrar, but it does provide the instructor with some control over enrollment.

### ***Credit-Hour Loads***

For four-year students with no Advanced Standing credit, an average of 15 credit-hours per semester is an appropriate pace. The amount of AS credit awarded to transfer students often affects the loads they attempt to carry; they may have lower division deficiencies but still want to complete a BS degree in four years. A common problem is to over-reach the first semester, under the false assumption that ESF classes are no more difficult than what they have had in the past. Academic difficulties may result.

- Undergraduate students are considered full-time with a load of 12 credit-hours. This status is important for most forms of financial aid.
- 14-16 credit hours are typical semester loads; only exceptional students should take 18 or more.
- Students in academic difficulty, or those enrolled through the Educational Opportunity Program (EOP), should try to minimize their credit-hour loads.

### ***Academic Probation, Suspension and Dismissal***

While some subjectivity is involved, the Dean of Instruction and Graduate Studies will usually place a student on academic probation if their cumulative grade point average (GPA) drops below 2.0, which is the minimum required for graduation. If satisfactory progress is not made after one semester on probation, the student is suspended from ESF. Advisors are kept apprised by the Dean by means of copies of communication with probationary students.

- *Satisfactory progress* is determined in comparison with a target GPA, the semester GPA a student would need to maintain to finish with a 2.0 cumulative GPA.
- Students on probation are restricted to a maximum load of 15 credit hours and should minimize extra-curricular activities. *Reminder:* while courses may be taken over the summer and transferred to lighten loads at ESF, the grades do not count in the GPA.
- Students may appeal an academic dismissal, and the advisor may volunteer (or be solicited for) comment on the probability of success, should the appeal be granted. Suspended students may reapply after one semester. A second suspension leads to dismissal, which is permanent.

### ***Privacy Issues***

Most information about you is private. Examples of private information include:

- Grades, or other information on plan sheets and transcripts (*private even from parents!*)
- Special enrollment (EOP, for example) or minority standing
- Disabilities
- Probationary standing
- Non-public personal information, including social security numbers.

### ***Independent Study and Internships***

An independent study is learning that the student undertakes with a particular faculty member. An internship is a working and learning opportunity sponsored by an employer with oversight from a faculty member. In both independent study and internships, strong emphasis is placed on student initiative. The Forestry Internship Agreement is included as Appendix B in this Handbook.

### ***Changes between FRM and NRM, FRM and FES, or NRM and FES***

Undergraduate students in the Department of Forest and Natural Resources Management are admitted to either the Forest Resources Management (FRM) degree program, or the Natural Resources Management (NRM) degree program, or the Forest Ecosystem Science (FES) degree program. Consequently, to change from one to another after admission is considered a change of degree program and you must follow the established College policy. Students considering making this type of change should go to the **Office of Career and Counseling Services** and discuss their request.

## **Appendix B: Internships**

### ***Internship Guidelines for Students***

These are general guidelines to be followed by any student undertaking an internship for academic credit. These general guidelines can be supplemented or amended by the particular faculty advisor and student depending on special circumstances.

1. All internships for which academic credit is desired must be set up in advance of beginning the internship. If circumstances preclude this then a meeting or discussion between the student, field supervisor, and faculty advisor must take place at the beginning of the internship period.
2. Students must complete, in consultation with the faculty advisor and field internship supervisor, a FNRM Internship Agreement (page 45 of this handbook).
3. Students will maintain periodic contact with their faculty advisor during the internship. This can either be by phone, email, or regular mail. Contact every two weeks is recommended.
4. Students will keep a journal in which they enter the activities in which they participate, meetings attended, and observations about the company/agency etc. with which they are working.
5. Students will keep a record of any projects for which they have particular responsibility for completion. This record would consist of copies of written reports, display material, data analyses, etc.
6. At the completion of the internship the student will prepare a written report that will address the following:
  - a. How did the internship relate to the course work you have had?
  - b. What different courses might you have taken or might now take after completing this internship?
  - c. What were the particular things you learned on this internship?
  - d. How did the work you were engaged in relate to things such as:

measuring natural resources	managing natural resources
biological and physical factors	policy making
communicating	ethics and leading
problem solving	other items as needed

7. At the completion of the internship here will be a one to two hour debriefing session which shall include the student and faculty advisor, and, if feasible, the field supervisor and another faculty member. During this debriefing the student will be asked questions such as those addressed in the written report.
8. The grade for the internship will be determined by the faculty advisor and field supervisor based on student's performance on the job, depth of thinking, observations contained in journal, final written report, and any written or oral presentations.

***FNRM Internship Agreement***

Preparation of this agreement is the responsibility of the student. It must be typed and written clearly and concisely. Please refer to the guidelines for the Internship Agreement. It must be on file with all approval signatures prior to registration for credit.

Internship Title:

Approvals:

Student: \_\_\_\_\_ Date: \_\_\_\_\_

Faculty sponsor: \_\_\_\_\_ Date: \_\_\_\_\_

Field Supervisor: \_\_\_\_\_ Date: \_\_\_\_\_

Addresses:

	Student	Field Supervisor	Alternate Supervisor
Name:	_____	_____	_____
Street:	_____	_____	_____
City:	_____	_____	_____
State:	_____	_____	_____
Zip:	_____	_____	_____
Phone:	_____	_____	_____

Internship Objectives:

Scope of Work:

Anticipated Work Schedule:

Commencement: \_\_\_\_\_

Completion: \_\_\_\_\_

Credit Hours: \_\_\_\_\_

Necessary Skills:

Previous Experience:

Support Being Provided:

Evaluation Procedures:

*Internship Evaluation*

Supervisor: \_\_\_\_\_

Student: \_\_\_\_\_

Please rate the student intern on each of the characteristics listed below by circling the appropriate number: (1) Outstanding, (2) Above average, (3) Average, (4) Below Average, (5) Unsatisfactory and (6) Unable to Judge.

- |                                |   |   |   |   |   |   |
|--------------------------------|---|---|---|---|---|---|
| 1. Ability to learn:           | 1 | 2 | 3 | 4 | 5 | 6 |
| 2. Interest:                   | 1 | 2 | 3 | 4 | 5 | 6 |
| 3. Preparation of assignments: | 1 | 2 | 3 | 4 | 5 | 6 |
| 4. Initiative:                 | 1 | 2 | 3 | 4 | 5 | 6 |
| 5. Quality of Work:            | 1 | 2 | 3 | 4 | 5 | 6 |
| 6. Reaction to criticism:      | 1 | 2 | 3 | 4 | 5 | 6 |
| 7. Cooperation:                | 1 | 2 | 3 | 4 | 5 | 6 |
| 8. Dependability:              | 1 | 2 | 3 | 4 | 5 | 6 |
| 9. Judgement:                  | 1 | 2 | 3 | 4 | 5 | 6 |
| 10. Communication:             | 1 | 2 | 3 | 4 | 5 | 6 |
| 11. Creativity                 | 1 | 2 | 3 | 4 | 5 | 6 |
| 12. Overall Evaluation:        | 1 | 2 | 3 | 4 | 5 | 6 |

Where your expectations of the intern [ ] met, [ ] exceeded, or [ ] not met?

In which ways? On the next sheet, please comment on the student's overall performance, including any strengths or weaknesses you feel are important.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**Appendix C: Faculty Directory**

**Nasri Abdel-Aziz**, Instructor: 205 Marshall Hall, 315-470-6972, e-mail: nabdel@esf.edu.  
Calculus.

**Lawrence P. Abrahamson**, Senior Research Associate: 126 Illick Hall, 315-470-6777, e-mail: labrahamson@esf.edu. Forest Entomology, Forest Pathology, Pesticides, Integrated Pest and Vegetation Management, Woody Biomass for Energy Crops.

**Eddie Bevilacqua**, Associate Professor: 301 Bray Hall, 315-470-6697, e-mail: ebevilacqua@esf.edu. Forest Measurements, Applied Statistics, and GIS.

**Russell D. Briggs**, Professor: 358 Illick Hall, 315-470-6989, e-mail: rdbriggs@esf.edu. Forest Soils and Silviculture.

**Karen Conahan**, Instructor: 206 Marshall Hall, 315-470-4815, e-mail: kconahan@esf.edu.  
Calculus.

**René H. Germain**, Professor and Graduate Studies Coordinator: 316 Bray Hall, 315-470-6698, e-mail: rhgermai@syr.edu. Sustainable Forestry Systems, Business.

**Diane Kuehn**, Associate Professor: 310A Bray Hall, 315-470-6561. e-mail: dmkuehn@esf.edu.  
Recreation Resources Management, Tourism Planning, Commercial Recreation

**Jacqueline LaVie**, Instructor: 204 Marshall Hall, 315-470-4818, e-mail: jelavie@esf.edu.  
Calculus.

**Robert W. Malmshemer**, Professor: 305 Bray Hall, 315-470-6909, e-mail: rwmalmsh@esf.edu. Forest and Natural Resource Law and Policy.

**Charles A. Maynard**, Professor: 216 Marshall Hall, 315-470-6560, e-mail: cmaynard@syr.edu.  
Forest Genetics, Tree Improvement, Plant Tissue Culture and Transformation.

**Douglas A. Morrison**, Research Associate: 306 Bray Hall, 315-470-6740, e-mail: damorris@esf.edu. Sociology, Psychology, Forest Recreation.

**David Newman**, Department Chair and Professor: 320 Bray Hall, email: dnewman@esf.edu.  
Forest Resource Economics, Land Use Change, Taxation, Policy.

**Christopher A. Nowak**, Professor and Undergraduate Studies Coordinator: 317 Bray Hall, 315-470-6575, e-mail: canowak@esf.edu. Vegetation Management, Silviculture, Forest Ecology, Sustainable Forest Management.

**Ralph D. Nyland**, Distinguished Service Professor: 312 Bray Hall, 315-470-6574, e-mail: rnyland@syr.edu. Silviculture, Forest Practice.

**Stephen V. Stehman**, Professor: 322 Bray Hall, 315-470-6692, e-mail: svstehma@syr.edu.  
Statistics, Sampling.

**John Stella**, Assistant Professor: 206 Marshall Hall, 315-470-4902, e-mail: stella@esf.edu.  
Hydrology, Watershed Management.

**Phillip Vidon**, Associate Professor: 309 Bray Hall, 315-470-4765, e-mail: pgvidon@esf.edu.  
Hydrology, Biogeochemistry.

**Timothy A. Volk**, Senior Research Associate: 346 Illick Hall, 315-470-6774, e-mail:  
tavolk@esf.edu. Short Rotation Intensive Culture Forestry, International Forestry.

**Sarah L. Vonhof**, Instructor: 303A Bray Hall, 315-470-6594, email: slvonhof@esf.edu.  
Environmental & Natural Resources History, Property Systems.

**John E. Wagner**, Professor: 304 Bray Hall, 315-470-6971, e-mail: jewagner@esf.edu. Forest  
Resources Economics.

**Ruth Yanai**, Professor: 210 Marshall Hall, 315-470-6955, e-mail: rdyanai@syr.edu. Forest  
Soils.

**Lianjun Zhang**, Professor: 323 Bray Hall, 315-470-6557, e-mail: lizhang@syr.edu. Forest  
Biometrics.

**Appendix D: Who to Call**

Below is a short list of offices/people that help get answers to your questions.

**Forest and Natural Resources Management Curriculum Coordinator** (Dr. Christopher Nowak, x 6575) for questions about:

- FNRM academic policies (general or specific)
- advisor assignments, temporary substitutions
- advising and registration schedules
- petitions
- complaints and (hopefully) recommendations

**Admissions Office** (Susan Sanford, Director, x 6600) for questions about:

- explanation and (early) modification of advanced standing credit
- advice on course equivalencies relating to petitions

**Registrar's Office** (Ray Blaskiewicz, Registrar, x 6654, x 6657) for questions about:

- access to online advising services mentioned above
- clarification of course slotting on Plan Sheet
- implementation of academic policies and procedures

**Office of Instruction and Graduate Studies** (Scott Shannon, Dean, x 6599) for questions about:

- interpretation of academic policies and procedures
- student probation and dismissal
- applicability of courses to General Education requirements
- special programs (minors, honors, science education)

**Office of Financial Aid & EOP** (John View, x 6670) for questions about:

- effects of credit load and academic standing on financial aid
- special considerations for students in Educational Opportunity Program

**Office of Multicultural Outreach** (Dr. Raydora Drummer, x 4815) for questions about:

- special concerns of minorities

**Office of Career and Counseling Services** (x 6660) for questions about:

- career exploration, testing, and related services
- personal advising/counseling, tutoring, disabilities
- program changes, withdrawal, and readmission