



# **Graduate Programs in Forest Resources**

## **2009—2010**

**Departments of  
Forest Ecosystems and Society  
and  
Forest Engineering, Resources and Management**

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## College of Forestry

Forestry is important to the people of Oregon. Forty-nine percent of the state's 61.4 million acres is forest land, which supports Oregon's most important industry, forest resources. The forests provide wood, water, fish habitat, scenery, recreation, cultural sites, wildlife, rangeland, and other resources which contribute to the State's and region's economy and quality of life.

### **Mission and Vision**

The mission of the College of Forestry, as part of Oregon's Land, Sea, Sun, and Space Grant University, is to educate and engage the next generation of scholars, managers, and users of the world's forest resources, to conduct distinctive problem-solving and fundamental research on the nature and use of forests and related resources, and to share our discoveries and knowledge with others.

The Oregon State University College of Forestry combines the warmth of a small school with the rich resources of a comprehensive university. Our students experience a rigorous, demanding, hands-on, professional education. The educational environment is friendly and supportive. College of Forestry students are a close-knit group. Professors teach their own classes and interact with students daily. They are caring and accessible.

### **Facilities and Programs**

Oregonians recognize the importance of their forests and have provided outstanding facilities for the College of Forestry. Peavy Hall and Richardson Hall, home of the College, contain modern classrooms, laboratories, self-learning, and media centers. Office space is provided for research and teaching assistants, and most graduate students. Computer facilities include several microcomputer and GIS laboratories, and other facilities dedicated to graduate student research.

Research conducted through our Forest Research Laboratory keeps the College in the forefront of new developments in forestry. Peavy Hall and Richardson Hall are adjacent to the Forestry Sciences Laboratory of the USDA Forest Service Pacific Northwest Research Station. The Forest and Range Ecosystem Science Center of the USDI Geological Survey also has a campus-based research program that complements and interacts with the College's. Nearby is the Environmental Research Laboratory of the U.S. Environmental Protection Agency. Collectively, these facilities and organizations comprise one of the largest concentrations of forestry and natural resources expertise in the world.

The College of Forestry has a long tradition of graduate education and research. Our programs provide a solid forestry background and competence in specialized fields. These strengths are recognized by potential employers in both the public and private sectors.

### **Research Forests**

The College of Forestry has access to two major forest properties dedicated to research and education. The 15,000-acre H. J. Andrews Experimental Forest is in the Willamette National Forest. It is owned by the USDA Forest Service but jointly managed by OSU and the Pacific Northwest Research Station under a National Science Foundation-sponsored long-term agreement. The McDonald-Dunn, Spaulding, Marchel, and Blodgett forest properties, totaling over 13,000 acres, are owned by the College of Forestry as the result of gifts and are managed by the College for enhancement of education and research.

### **Departments**

Few forestry programs have the breadth represented by the three departments in the College of Forestry at OSU. Wood Science and Engineering (**WSE**--wood industry management and wood science and technology), Forest Ecosystems and Society (**FES**--forest ecology and social science) and Forest Engineering, Resources and Management (**FERM**--engineering, planning and active management) all offer undergraduate, graduate, extended education, and research programs.

### **Graduate Program Areas**

The College of Forestry has four Graduate Program Areas located in its three departments.

1. Forest Engineering is located in the FERM Department.
2. Forest Resources is located in both the FERM and the FES Departments.
3. Forest Science is located in the FES Department.
4. Wood Science and Engineering is located in the WSE Department.

Information about Graduate Programs other than the Forest Resources Graduate Program should be directed to the department in which the program is housed. For more information about these alternative Graduate Programs, consult OSU's Bulletins (Graduate Catalog and General Catalog), or visit the College of Forestry's website at <http://www.cof.orst.edu>.

## Forest Resources Graduate Program Area

The Forest Resources graduate program area is jointly administered by the Departments of Forest Ecosystems and Society (FES) and Forest Engineering, Resources and Management (FERM). The graduate program area includes master of forestry (MF), master of science (MS) and doctoral (PhD) degree programs in an array of areas of concentration depending on the degree program as listed below:

### **Master of Forestry**

- General
- Silviculture

### **Master of Science**

- General
- Forest Biometrics/Modeling
- Forest Management
- Silviculture
- Forest Social Science
- Forestry/Wildlife
- Remote Sensing, GIS and Landscape Ecology
- Natural Resource Education and Extension
- Natural Resource Policy and Law

### **Doctor of Philosophy**

- Forest Measurements
- Forest Operations Research/Management Science
- Silviculture
- Forest Social Science
- Forestry/Wildlife
- Remote Sensing, GIS and Landscape Ecology

Students interested in the Forest Resources graduate program area should apply for admission to either the FES or FERM department depending on the location of their proposed major professor.

Students interested in graduate study in **Forest Economics** should visit the website for the Graduate Program in Applied Economics at [http://oregonstate.edu/dept/grad\\_school/economics/](http://oregonstate.edu/dept/grad_school/economics/). This program is offered by economists located in several departments at Oregon State University, including FERM, FES, the Department of Agricultural and Resource Economics, Department of Economics, and the Department of Public Health. The program is administered by the Graduate School. Interested students are encouraged to directly contact participating faculty in the FES and FERM departments for more information.

## General Information

You can visit Oregon State University and the College of Forestry through the World Wide Web at the following addresses:

Oregon State University	<a href="http://oregonstate.edu/">http://oregonstate.edu/</a>
College of Forestry	<a href="http://www.cof.orst.edu/">http://www.cof.orst.edu/</a>
Dept of Forest Engineering, Resources & Management	<a href="http://www.cof.orst.edu/cof/ferm/">http://www.cof.orst.edu/cof/ferm/</a>
OSU Graduate School	<a href="http://oregonstate.edu/Dept/grad_school/">http://oregonstate.edu/Dept/grad_school/</a>
Office of Financial Aid	<a href="http://oregonstate.edu/admin/finaid/">http://oregonstate.edu/admin/finaid/</a>
Office of Admissions	<a href="http://oregonstate.edu/admissions/">http://oregonstate.edu/admissions/</a>
University Housing & Dining Services	<a href="http://oregonstate.edu/uhds/">http://oregonstate.edu/uhds/</a>
Graduate School Guide to Success	<a href="http://oregonstate.edu/dept/grad_school/current/success.html">http://oregonstate.edu/dept/grad_school/current/success.html</a>

### Graduate School Catalog and Success Booklet

The Oregon State University Graduate Student Catalog, published on the Web at <http://catalog.oregonstate.edu>, provides detailed information on University regulations and procedures. The catalog also contains a complete list of graduate level courses offered by all departments at OSU. The Graduate School Student Success Booklet is a compilation of regulations about graduate programs, examinations, and graduation requirements. The Success Booklet is available online from the Graduate School at [http://oregonstate.edu/dept/grad\\_school/current/success.html](http://oregonstate.edu/dept/grad_school/current/success.html).

### The University and Community

OSU is one of only ten American universities to hold the Land Grant, Sea Grant, Sun Grant, and Space Grant designation and is a Carnegie Doctoral/Research-Extensive university. Approximately 15,800 undergraduate and 3,500 graduate students are enrolled at OSU, including 2,800 U.S. students of color and 900 international students. The university has an institution-wide commitment to diversity and multiculturalism, and provides a welcoming atmosphere with unique professional opportunities. OSU is located in Corvallis, a community of 55,000 people situated in the Willamette Valley between Portland and Eugene. Ocean beaches, lakes, rivers, forests, high desert, and the rugged Cascade and Coast Ranges are all within a 100-mile drive of Corvallis. The surrounding farmland is dedicated to growing a wide variety of crops, and there are extensive recreation areas in local, state and federal parks, including forested lands and rivers. The entire valley corridor enjoys a mild, temperate climate.

## **Housing**

A variety of housing and dining accommodations are available to graduate students. Both one-term and academic-year contracts are available.

All graduate students interested in applying for student family housing owned by the University should contact the Department of Student Housing and Residence programs in advance of the projected need. Other listings and pertinent off-campus housing information to help students obtain local housing are available on the second floor of the Kerr Administration Building adjoining the Student Services area. Postings for off-campus housing can also be found at the following website:

<http://oregonstate.edu/students/offcampus.htm>.

Graduate teaching assistantships as Residence Hall and Cooperative House Directors are sometimes available for those with appropriate experience. There also may be opportunities as Resident Advisors in private living groups. Contact the Department of Student Housing or the Office of the Dean of Students for more information.

University Housing and Dining Services  
102 Buxton Hall  
Corvallis, OR 97331 USA  
Voice: 541-737-4771 or 800-291-4192  
Fax: 541-737-0686  
<http://uhds.oregonstate.edu/>  
[uhds@oregonstate.edu](mailto:uhds@oregonstate.edu)

## **Office Accommodations**

To the extent possible, the Department makes office space available to graduate students. Available desk and file space is assigned by the Department office. Computer access is provided in several computer labs. Students may provide their own computers if they wish, but will be charged for network connection.

## **Computing Facilities**

The College of Forestry maintains an extensive network of computing laboratories for exclusive use by graduate students. Some labs are scheduled for short-term use, others for longer-term projects. Many machines have specialized software for particular applications. All are internet capable. Both Richardson and Peavy Halls also have wifi access in all rooms.

## Admission Procedures

The Admissions Office screens candidates to ensure that the minimum standards of the University are met. The University requires a four-year baccalaureate degree from an accredited college or university, and a combined GPA of 3.00 on the last 90 credit hours of graded undergraduate work on the first baccalaureate degree plus all work completed thereafter; or a four-year baccalaureate degree from an accredited college or university and a 45-quarter credit hour graduate degree from an accredited university.

All applications materials sent to the Office of Admissions will be passed on to the department (either FES or FERM). The Graduate Admissions Coordinator screens applications for satisfaction of the departmental minimum standards and asks a panel of faculty members in the area(s) of the applicant's interests for a detailed review of all materials. **Note:** The department faculty cannot effectively review an application until all materials have been received.

Notice of acceptance by the department is sent within two months after applications are completed. Applicants occasionally confuse Letters of Acceptance from the department, or correspondence from faculty, as equivalent to admission. The "Notice of Admission" issued solely by the Office of Admissions, Oregon State University, is the official University notice to the applicant that all application and review procedures have been completed and that the student may enroll in the term for which he or she has applied.

### Application Procedures

Persons seeking admission to any of the Graduate programs of the department should follow these instructions. Applicants must submit the following to:

Office of Admissions and Orientation  
Oregon State University  
104 Kerr Administration Building  
Corvallis, OR 97331-2106

1. Original and two copies of the paper application form or one electronic version of the graduate application (available at: <http://oregonstate.edu/admissions/index.html>). MAIS applicants must submit an original and five copies. **Note:** In section 10 of the application (degree sought), the 4-digit academic major code for the Forest Resources graduate program area is 3880.

2. A \$50 check or money order in U.S. dollars, payable to Oregon State University. This is a non-refundable application fee. Online applications must be paid by credit card. This fee is subject to change without notice.
3. Three photocopies of all unofficial transcripts (grade slips/reports are not acceptable) of previous academic work, undergraduate and graduate or one sealed official transcript from each institution. MAIS applicants must submit six copies of all transcripts. Transcripts must show:
  - a. the last 90 quarter credits (60 semester credits), of graded course work in the first baccalaureate degree; and
  - b. all course work completed after the first baccalaureate degree.

We suggest that a copy of unofficial transcripts be sent directly to the department.

International applicants must provide a certified English translation of their academic transcripts.

If admitted, two official transcripts from the above institutions must be received by the Office of Admissions prior to the student's second term of registration.

4. Three letters of reference. References should be from instructors in courses related to your major, employers, or others who can critically evaluate your potential as a graduate student in Forest Resources. An applicant with a Master's degree should include a letter from his/her major professor. **These letters should be submitted directly to either the FES or FERM departments, not to Admissions.**
5. Letter stating your objectives for graduate study and particular fields of interest in Forest Resources. Note: Please be as specific as possible. Limit your statement to one or two pages. The Graduate Admissions Committee relies heavily on your letter to determine the appropriate faculty reviewers for your application.
6. Official scores from the general test of the Graduate Record Examination (GRE). All applicants (except MAIS Degree) must do this. No "advanced test" scores are required. **The OSU institution code is R4586.** All scores are received electronically and transferred into the University BANNER system.

7. International Students Only:

For consideration of your application, collect and mail all application materials in one package. Sending materials by FAX is not acceptable.

- a. Photocopy of TOEFL score with a minimum score of 550 (paper) or 213 (computer). Note: IELTS may be substituted for TOEFL (see below). TOEFL scores must be no more than 2 years old at the time registration. (If the applicant is admitted, official TOEFL scores must be received by the Graduate Admissions Office prior to the start of the first term of enrollment.)
- b. Financial Certificate with supporting documentation demonstrating sufficient financial resources for the desired academic program. Even if an applicant is acceptable to the department, a prospective student is required to certify that he/she has adequate funds for proposed studies in this country before a visa form is prepared and acceptance to the university is definite. This Certificate form is available from the Office of Admissions.

**Graduate Record Examination (GRE)**

Information regarding the times, locations, and administration of the GRE is available from the World Wide Web at <http://www.gre.org/> or from:

Counseling and Testing  
Oregon State University  
322 Kerr Administration Bldg  
Corvallis, OR 97331  
Phone: 541-737-2131

Or  
Graduate Record Examinations  
Educational Testing Service  
P. O. Box 955  
Princeton, NJ 08540  
Phone: 609-771-7670

Or  
Phone: 510-873-8100 (Oakland, CA) Fax: 609-771-7906

**Note:** When indicating recipients of scores on your GRE registration form, please specify the Oregon State University institution code (R4586) to ensure that we receive your scores. Take the GRE far enough in advance so your scores will reach the University before application deadlines.

**Test of English as a Foreign Language (TOEFL)/International English Language Testing System (IELTS)**

International applicants must present proof of proficiency in English by submitting acceptable results (a minimum score of 550 paper or 213 computer test on the TOEFL or a score of 7.0 or higher on the IELTS). TOEFL or IELTS is required of all applicants whose first language is not English, including those transferring from English-speaking colleges and universities or entering from a U.S. high school. TOEFL/IELTS is not



required for applicants who are citizens or permanent residents of the U.S. or who have earned Bachelor's or advanced degrees from a U.S. university. Scores more than 2 years old at the time you plan to enroll will not be accepted.

International students may be required to do a test of spoken English prior to enrollment. If this test indicates that remedial work is needed to successfully complete the requirements of the graduate program, the student may be required to take the needed remedial work at his/her own expense through the English Language Institute.

### **Application Deadlines**

We encourage you to apply early and to follow the application procedures carefully. Forest Resources application deadlines are the same as the Oregon State University deadlines.

**Note:** Send your application materials as early as possible; the Admissions Office is very busy in January and may not be able to forward necessary documents to the departmental office in a timely manner. You must be admitted to a department to be considered for fellowships, *so it is highly recommended that you send application materials in early December or before.*

*Students within the U.S.:* Applications must be received by the Office of Admissions absolutely no later than 45 days prior to the first day of classes. Students are advised to submit all materials as early as possible.

*International Students Outside the U.S.:* To allow adequate time for students to obtain Visas and make travel arrangements, the following deadlines have been established for international applicants applying from foreign addresses:

April 1	for Fall Term
July 1	for Winter Term
October 1	for Spring Term
January 1	for Summer Term

### **Delayed Enrollment**

Candidates who have been admitted but fail to enroll and who wish to be considered for a subsequent academic year (within one year of the original application) must reactivate their application through the Office of Admissions.

## **Continuous Enrollment**

All graduate students are required to register for a minimum of 3 credits each term with the exception of summer unless using university services during that time. An official, limited Leave of Absence can be granted for those with good causes. Those who do not register for the required minimum must file an Application for Graduate Readmission, which must be approved by the student's Major Professor, Department/Program Chair, and Graduate Dean and acceptance is not guaranteed. If approved, for the first term of reinstatement, the student must register for a minimum of 3 graduate credits for each term of unauthorized break.

## Financial Assistance

Qualified applicants requesting a “graduate appointment” on the Application Form are automatically considered for financial assistance. No special application or additional materials are required. Notification of the award of financial aid is included with your departmental letter of acceptance.

### Graduate Research Assistantships (GRAs)

Graduate Research Assistantships, the most common form of financial aid, are awarded annually depending on degree, experience, and availability of funds. Some graduate assistants may be members of a Bargaining Unit. For these graduate assistants, terms and conditions of employment for service not required as part of their degree requirements are prescribed in a Collective Bargaining Agreement. **Competition for Assistantships is very intense. There can be no assurance that funding will be available.**

An assistant on a half-time appointment normally spends one-third of his or her time on research during the academic year and full-time during the summer. Assistantship appointments also provide tuition remission. The policy includes summer term. For the complete Graduate Tuition Remission Policy, see:

[http://oregonstate.edu/dept/grad\\_school/Graduate\\_Funding/tuitionremissionhome.htm](http://oregonstate.edu/dept/grad_school/Graduate_Funding/tuitionremissionhome.htm).

Because Research Assistantships are associated with individual faculty research projects, work is supervised by the faculty Principal Investigator, usually the major professor. Normally, this work serves as the basis for the student’s Thesis, although the student may also be required to perform other research tasks. The number of assistantships varies from year to year depending on the research programs of the Department and availability of funds.

### Graduate Teaching Assistantships (GTAs)

Graduate Teaching Assistants are usually appointed for an academic term and include Tuition Waiver. Teaching Assistantships are often combined with Research Assistantships. All PhD students are expected to assist in teaching at least one term during their residency to gain experience in this important endeavor.

## Fellowships

Priority will be given to applications completed and received by the Graduate Coordinator in the department by **January 1** for College fellowship consideration. The College of Forestry administers the Mary McDonald, Schutz, Moltke, Hoener, Alexander, and other Fellowships; requirements vary. All recipients must meet academic standards; Fellowships often accompany a GRA/GTA offer. The department nominates applicants, and the College of Forestry Fellowship Committee considers nominees from all departments and awards the fellowships to the most qualified nominees. In addition, the OSU Graduate School administers numerous fellowships for applicants selected from department nominees.

A number of University fellowships and scholarships are available with complete information through the Graduate School web site at: [http://oregonstate.edu/dept/grad\\_school/future/fellowscholar.html](http://oregonstate.edu/dept/grad_school/future/fellowscholar.html).

## Credit-hours

Departments expect that assistants register for the maximum number of credits. The number of credit-hours allowed each term for graduate research and teaching assistants depends on the appointment level. For example, a 15 percent appointment may register for fifteen credit-hours each term, and a 30 to 50 percent appointment may register for twelve credit-hours. **Graduate assistants must register for and complete a minimum of sixteen credit-hours each term of the appointment, and nine credit hours Summer term.** All students enrolling for at least 9 credits are advised to register for their maximum allowable credits each term, using thesis credits to increase their loads to the allowable maximum.

## Student Hourly Wages

Some professors may hire graduate students to work on an hourly basis for their research projects. These opportunities are limited by available funds. Total compensation may not exceed the equivalent of a 50 percent Graduate Assistantship and does not include a tuition waiver.

## **OSU Financial Aid**

The University Financial Aid Office administers student loans, grants, College work-study, and scholarship programs, including foreign student tuition scholarships. For more information, contact:

OSU Financial Aid Office  
Oregon State University  
218 Kerr Administration Building  
Corvallis, OR 97331  
541-737-2241  
<http://oregonstate.edu/admin/finaid/>

## Graduate Programs

The Forest Resources graduate program area includes MF programs in Forest Management and Silviculture, and MS and PhD programs in Applied Economics, Forest Management, Forest Measurements, Natural Resources Policy and Law, Silviculture, Forest Social Science, Forestry/Wildlife, and Natural Resource Education and Extension. Applicants without forestry backgrounds must achieve competence in forestry through independent study or other means decided by each student's graduate advisory committee.

### Master of Forestry

The degree of Master of Forestry is designed for students who want one or more years of formal graduate work and who plan professional careers as line or operational managers with forestry organizations, either public or private. The general MF program gives graduate level preparation in the full range of disciplines essential to the wise use and management of forest lands. Some specialization is possible, but the main objective is to improve students' knowledge of and competence in comprehensive forest management. The MF is not intended for those students wishing to pursue research interests or a higher degree.

A special option, the MF in Silviculture, is also available and is intended for students desiring to specialize in prescribing silvicultural practices.

### Master of Science

MS students may choose from a variety of concentration areas and may, with consent of their advisor and committee, tailor a concentration to meet their individual needs. Following are brief descriptions of the most common concentrations. Details follow in subsequent pages.

*Forest Measurements, Remote Sensing, GIS:* Students in forest measurements and related disciplines apply statistical methods to forestry problems and develop biologically sound mensuration techniques to assist forest managers. Current research includes forest growth and yield modeling, aerial photogrammetry, remote sensing, Geographic Information Systems, and modern forestry inventory techniques.

*Natural Resources Policy and Law:* Intended for students with interests in the broad policy arena surrounding natural resource management, utilization, and protection. Emphasis is placed on advanced-level work in policy formation, policy analysis, conflict resolution, and law. The goal of this degree program is to prepare students for professional careers in the broad field of natural resource policy and management.

*Forest Social Science:* Students explore social and human dimensions aspects of forests and forest related resources, such as resource ownership, management, recreation, tourism, and policy.

*Natural Resources Education and Extension:* Intended for students who wish to develop their communication and education skills, this program is for people who want to help bridge the information gap that exists between natural resource experts and a variety of audiences. A substantial background in natural resource management is essential for graduate course work in this field.

*Silviculture:* Silviculture focuses on balancing the inherent characteristics of a site with the array of management objectives for that site, analyzing impacts on physical, biological, and social, resource values. Topics for research include forest soils, nutrient cycling, forest regeneration, forest protection, ecology and management of shrubs and hardwoods, growth and yield from large-scale application of silviculture techniques, stand dynamics, fuels management and fire behavior, and wildlife habitat management.

## **PhD**

The doctoral program in Forest Resources is intended for persons seeking careers in teaching and research. The program emphasizes a strong research specialization while maintaining an understanding and appreciation of broader management and resource-use issues. The thesis and associated research play a dual role by enabling the student to develop in-depth knowledge of specific technical areas, while at the same time gaining experience in conceptualizing, planning, conducting, and reporting a major research project. Areas of concentration are described at a later point in this booklet.

Students interested in graduate study in **Forest Economics** should visit the website for the Graduate Program in Applied Economics at [http://oregonstate.edu/dept/grad\\_school/economics/](http://oregonstate.edu/dept/grad_school/economics/). This program is offered by economists located in several departments at Oregon State University, including FERM, FES, the Department of Agricultural and Resource Economics, Department of Economics, and the Department of Public Health. the program is administered by the Graduate School. The program of study includes two areas of concentration, one of which may be designed by the student's committee and the student to address a specific research focus in forestry or other area. Interested students are encouraged to directly contact participating faculty in the FES and FERM departments for more information.

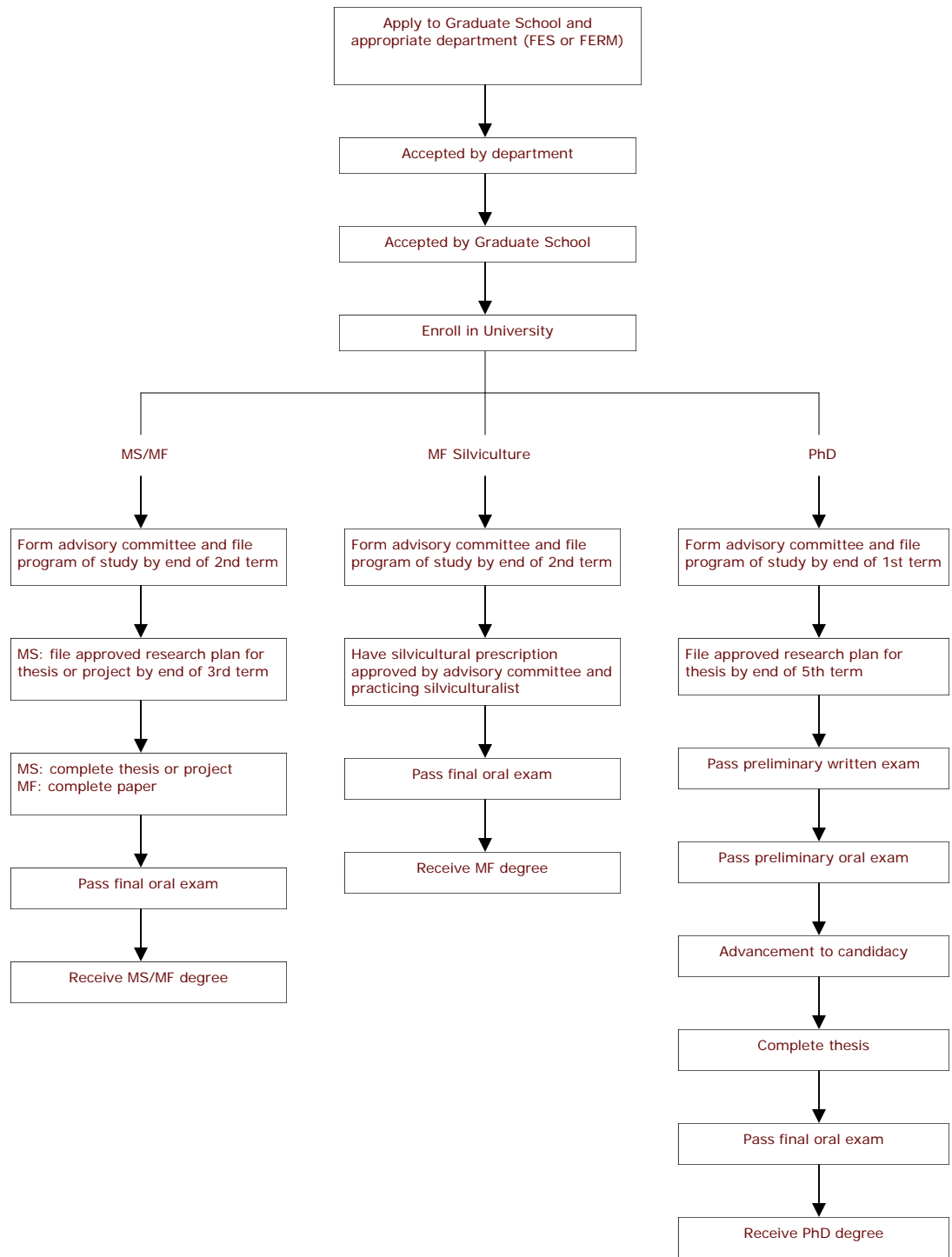
## FR Graduate Faculty in FERM

<u>Name</u>	<u>Research Interests</u>
John Bailey	Silviculture, fuels and fire management, and adaptive ecosystem management.
Richard Fletcher	Private forest management, certification, Christmas trees.
Temesgen Hailemariam	Forest biometrics and measurement.
David Hann	Forest biometrics and measurement.
Douglas Maguire	Mechanisms controlling forest growth and yield; quantitative silviculture; crown structure and dynamics; natural forest regeneration.
Jeffrey McDonnell	Conceptualization of streamflow generation processes in steep terrain, how water flowpaths on steep slopes affect slope stability, use of isotope tracers for determining water source, age and flowpath, study of forest road and logging effects on stream hydrology and water quality.
Claire Montgomery	Natural resource and forest economics, econometrics, applied economics.
Glen Murphy	Harvesting system productivity, economic evaluation of environmental impacts caused by harvesting, value recovery, supply chain management.
Robin Rose	Reforestation; plant physiology; forest nursery management; nursery stock evaluation; forest soils; vegetation management; international forestry — India, Thailand, Vietnam, China, Taiwan, New Zealand, South Africa.
Julian Sessions	Wood transportation, optimal bucking practices, timber harvest scheduling, timber supply, scheduling of silviculture practices, fire hazard reduction, logging mechanics, international forestry.
Michael Wing	Geographic Information Systems (GIS), Global Positioning Systems (GPS), remote sensing, land surveying and geodesy, visualization and visibility analysis, crime mapping and analysis, geographic information science, digital measurement tools for natural resource applications, stream habitat, precision forestry, spatial statistics.

## FR Graduate Faculty in FES

<u>Name</u>	<u>Research Interests</u>
Jo Albers	Natural resource economics, applied economics.
Badege Bishaw	Agroforestry/social forestry, silviculture/international forestry.
John Bliss	Private forest policy, forest-based rural development.
Paul Doescher	Restoration ecology.
Ed Jensen	Natural resource education, forest ecology.
Norman Johnson	Forest planning, harvest scheduling, public land forest policy.
Kreg Lindberg	Eco-tourism (Cascades Campus).
Brenda McComb	Wildlife.
Mark Needham	Recreation, tourism, and human dimensions of natural resources.
Mark Reed	Educational technology, natural resource education.
Ron Reuter	Restoration ecology, pedology, wetland soils, landscape ecology (Cascades Campus).
William Ripple	Wildlife habitat analysis, landscape ecology.
Randall Rosenberger	Recreation economics, applied economics.
Bo Shelby	Sociology of natural resources.
Bruce Shindler	Social aspects of natural resources.
Viviane Simon-Brown	Human dimensions of natural resource sustainability.
Jo Tynon	Recreation resource management.

## Flow Diagram for Graduate Programs in Forest Resources



## Master of Forestry (MF)

### *General Master of Forestry*

The degree of Master of Forestry is designed for students who want one or more years of formal graduate work and who plan professional careers with forestry organizations, either public or private. The general MF program gives graduate level preparation in the full range of disciplines essential to the wise use and management of forest lands. Specialization is possible, but the main objective is to improve students' knowledge of and competence in comprehensive forest management. The MF is not intended for those students wishing to pursue research interests or a higher degree.

### *Master of Forestry in Silviculture*

The MF in Silviculture is a program jointly administered by the departments of Forest Engineering, Resources & Management and Forest Ecosystems and Society. It is designed for practicing foresters who wish to upgrade their professional skills and knowledge of silviculture and forest resource management. The program is aimed at career-oriented persons who wish to expand their capabilities of analyzing silvicultural opportunities in the context of economic production objectives, while maintaining sensitivity to physical, biological, social, cultural, and environmental forest resource values.

The program provides graduate-level education in the full range of disciplines essential for analyzing opportunities, solving problems, and making decisions in silviculture and forest resource management. Graduates from this program should be competent to prepare well-documented silvicultural prescriptions and to supervise their implementation. The program also provides the building blocks for sustained career development in forest resources management. The MF in Silviculture is not intended for those students wishing to pursue research interests or a higher degree.

Application may be made through the Department of Forest Engineering, Resources & Management or the Department of Forest Ecosystems and Society.

### **Accreditation**

Both the general MF degree and the MF in Silviculture degree are accredited by the Society of American Foresters.

## Admission to the Program

Applicants for the MF degree must meet the standards and requirements of the Graduate School (see the OSU Graduate Catalog) and the appropriate department.

## Minimum Educational Background

To pursue this degree program, students must have either:

1. A BS in Forestry from an institution accredited by the Society of American Foresters (SAF),  
or
2. A Bachelor's or higher degree in Forestry or a related area from an institution accredited by the Society of American Foresters.
3. Have a high scholastic record (a grade point average of 3.0 or higher, on a scale of 0-4.0 with 4.0 being highest).

*Basic science and mathematics:* Chemistry, biology, mathematics, statistics, and computer applications. The objective here is a background that will enable the student to successfully complete future courses.

*Liberal arts:* Oral and written communication, literature, economics, sociology, political science, philosophy, history, culture, and contemporary perspectives. The objective here is to provide a broad foundation for developing managerial skills and to place Forestry in the proper social context.

*Forestry:* Forest Biology and Ecology, Forest Measurements, Forest Management, Forest Policy & Administration, and related Natural Resource courses. The objective here is to ensure that students have the coursework equivalent to a BS in Forestry from a SAF-accredited institution.

In cases where the student already has a BS in Forestry, he or she may proceed directly to graduate-level coursework. In cases where the student's background in forestry is limited it may be necessary to take remedial courses or to pursue a Post-Baccalaureate degree in Forestry before or concurrent with embarking on the MF degree program (Track 2). Such determinations will be made prior to enrollment in the MF program.

## Graduate Committee

The department head assigns a major professor for each MF student when admitted. The major professor, who must be a member of the Graduate

Faculty, serves as the student's primary advisor in developing a program of coursework and in other academic matters. During the student's first term, the major professor will help the student establish an advisory committee. For the General MF student, the committee must consist of at least two other faculty members, including one or more from the College of Forestry. For the Silviculture MF, the advisory committee must consist of at least two other faculty members, including one each from the Department of Forest Engineering, Resources & Management and the Department of Forest Ecosystems and Society.

### **Program of Study**

The program of study is based on the student's educational background, professional experience, current interests, and future goals. The program is developed, documented, approved, and its progress monitored by the advisory committee and the department head. The program must be filed with the Graduate School by the end of the second term of residency.

### **Graduate Coursework**

Graduate coursework will be structured to meet all applicable regulations of the Graduate School. A total of 45 credit hours of graduate-level courses is required. Courses taken to meet the minimum educational background may not be used to meet this requirement. At least 21 credits are to be selected from a series of designated courses within the College of Forestry. As many as 24 credits may be elected from other courses offered by the College or University.

### **Time Limit**

All course work, project credit, and examinations must be completed within a seven-year period. This requirement is strictly enforced.

### **Required Courses**

All graduate students must complete FOR 561, Forest Policy Analysis, and one additional course in the FES or FERM departments taught exclusively at the graduate level, plus two additional College of Forestry graduate courses (exclusive of FS 521). The seminar listed below (FOR 507) should be one in which the students give an oral presentation describing their MF project or paper.

## General Master of Forestry

### Requirements

ST 511 and 512 should be completed prior to enrolling in FOR 524; ST 531 may be taken concurrently with FOR 524. Knowledge of FORTRAN (or similar language) and computerized data processing is also required for FOR 524.

ST 511, 512	Methods of Data Analysis	4,4
ST 531	Sampling Methods	3
FOR 524	Forest Biometrics	3
FOR 534	Economics of the Forest Resource	3
FOR 561	Forest Policy Analysis	3
FOR 506	Project (Professional Paper)	3
FOR 507	Seminar	1
FS 543	Advanced Silviculture	4

### Additional Coursework

The student and advisory committee will select at least 13 credit hours of additional courses to either broaden the student's knowledge of management methods or to specialize in a particular subject area such as Economics, Biometrics, or Silviculture.

### Professional Paper

To provide experience in the communication of technical information and in synthesis of material researched from the scientific literature, the student will complete one professional paper. The topic is decided by the advisory committee. The paper should be of sufficient quality and depth to earn, by unanimous agreement of the advisory committee, a grade of B or better in a 3-credit course, FOR 506 Projects.

### Final Oral Examination

Given the broad educational objectives of the MF program, the oral examination is intended as a comprehensive evaluation of the candidate's ability to integrate knowledge from diverse areas of Forest Management. Consideration of the professional paper may catalyze the discussion, but because it is not designed to be a work of original and innovative research, the topic of the paper usually will not dominate the examination.

## **Work Experience**

Because practical experience complements academic education, the student is strongly encouraged to work at least one summer in forestry or for a forestry-related organization while earning the MF degree, if such experience was not obtained previously.

## Master of Forestry in Silviculture

### Requirements

#### Silviculture and Related Courses

FOR 534	Economics of the Forest Resource	3
FS 543	Advanced Silviculture	4

*Two of the following courses or their equivalent:*

FE 530	Watershed Processes	4
FS 545	Advanced Forest Community Ecology	4
FS 646	Ecosystem Analysis and Application	4

#### Forest Protection and Environmental Sciences

*Three of the following courses or their equivalent:*

BOT/ENT 515	Forest Insect and Disease Management	5
CE 556	Environmental Assessment	4
CSS 540	Weed Control	4
FE 532	Forest Hydrology	3
FE 535	Water Quality and Forest Land Use	3
FOR 536	Wildland Fire Science & Management	4
FOR 546	Wildland Fire Ecology	4
FS 548	Biology of Invasive Plants	3
FS 553	Forest Wildlife Habitat Management	4
FW 581	Wildlife Ecology	3

#### Analytical Skills

*One of the following courses is recommended:*

BA 558	Innovation and Product Management	4
BA 571	Information Management	3
FOR 521	Advanced GIS Applications in Forestry	3
FOR 524	Forest Biometrics	3
FOR 525	Forest Modeling	3
FS 521	Natural Resource Research Planning	2
FS 523	Natural Resource Data Analysis	4
ST 511, 512, 513	Methods of Data Analysis	4,4,4
ST 521, 522	Introduction to Mathematical Statistics	4,4
ST 531	Sampling Methods	3
ST 551, 552, 553	Statistical Methods	4,4,4

#### Communication and Integrative Skills

FOR 507	Seminars	2
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**Practicum: A written silvicultural prescription for a forest management situation is required.**

FOR 506	Special Project: Silvicultural Prescription	7
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#### Business Management or Social Science Options

The Business Management Option is designed for students with an interest in legal, financial, and managerial aspects of forest business enterprises. The Social Sciences Option is intended to serve students with an interest in issue management and policy development in the context of forest resource management. Three courses, or courses pertaining to similar topics, in either of the two options listed below are recommended:

### **Business Management Option**

BA 536	Financial Risk Management	4
BA 550	Organizational Management	3
BA 562	Managing Projects	3
BA 571	Information Management	3
FOR 557	Techniques for Forest Resource Analysis	4
PSY 596	Industrial and Occupational Psychology	3

### **Social Science Option**

AREC 550	Environmental Economics	3
ECON 539	Public Policy Analysis	4
FOR 532	Economics of Recreation Resources	4
FOR 537	Valuation of Non-Market Resources	3
FOR 551	History and Cultural Aspects of Recreation	4
FOR 544	Ecological Aspects of Park Management	3
FOR 558	Concepts of Forest Recreation Planning & Management	3
FOR 559	Forest Resource Planning and Decision Making	4
FOR 593	Environmental Interpretation	4
HSTS 513	History of Science	3
HSTS 521	Technology and Change	3
PHL 540	Environmental Ethics	3
PHL 570	Philosophy of Science	3
PS 514	Interest Groups	4
PS 515	Politics and the Media	4
PS 524	Administrative Law	4
PS 572, 573	Public Administration	4,4
PS 574	Bureaucratic Politics	4
PS 575	Environmental Politics and Policy	4
PS 576	Science and Politics	4
SOC 556	Science and Technology in Social Context	3
SOC 575	Rural-Urban Sociology	3

### **Additional Coursework**

The student and advisory committee will select at least 13 credit hours of additional courses to either broaden the student's knowledge of management methods or to specialize in a particular subject area such as Economics, Biometrics, or Silviculture.

### **Special Project — Silvicultural Prescription**

To provide experience in the communication of technical information and in synthesis of material researched from the scientific literature, the student will complete one professional paper. The topic is decided by the advisory committee. The paper should be of sufficient quality and depth to earn, by unanimous agreement of the advisory committee, a grade of B or better in a 3-credit course, FOR 506 Projects.

### **Final Oral Examination**

Given the broad educational objectives of the MF program, the oral examination is intended as a comprehensive evaluation of the candidate's ability to integrate knowledge from diverse areas of Forest Management. Consideration of the professional paper may catalyze the discussion, but because it is not designed to be a work of original and innovative research, the topic of the paper usually will not dominate the examination.

### **Work Experience**

Because practical experience complements academic education, the student is strongly encouraged to work at least one summer in forestry or for a forestry-related organization while earning the MF degree if such experience was not obtained previously.

## **Master of Science (MS, General)**

The Master of Science in Forest Resources is appropriate for students who want two or more years of formal graduate work and who wish to develop a limited research specialization. Designed primarily for persons pursuing careers in research or teaching, the general MS program can be either a first step toward a doctorate or a terminal degree. The program provides an opportunity for independent research to be reported in a formal Master's Thesis. Areas of concentration for thesis research include: Forest Management, Applied Economics, Forest Policy and Law, Forest Biometrics/Modeling, Forest Social Science, Forestry/Wildlife, Silviculture, and Remote Sensing and GIS (Geographic Information Systems).

### **> Admission to the Program**

An applicant for the MS degree must meet requirements of the Graduate School (see OSU Graduate Catalog) in addition to those of the department. An applicant generally must hold a Bachelor's degree in Forestry or a related area from an institution accredited by the Society of American Foresters and have a high scholastic record (a grade point average of at least 3.0). In some cases an applicant who does not meet these requirements may be provisionally admitted when, in the opinion of the Graduate Admissions Committee and department head, his or her accomplishments indicate high potential for success as an MS candidate.

### **> Graduate Committee**

A major professor will be assigned by the department head to each student when admitted. The major professor serves as the student's primary advisor in developing a program of coursework, in selecting a thesis topic, and in other academic matters. An advisory committee will be selected jointly by the student and major professor. It will consist of two members of the Graduate Faculty of the student's department (one being the student's major professor), one member of the Graduate Faculty from each declared minor department if applicable, and a Graduate Representative (appointed by the Graduate School) if the student is writing a thesis. At least one member of the committee (in addition to the Graduate School representative) should be from a department outside of the College of Forestry.

### **> Time Limit for Master's Degree**

All course work, thesis, and examinations must be completed within a seven-year period. This requirement is strictly enforced.

## > Thesis and Language Requirements

The Graduate School prescribes the form of the thesis, as well as the timing and nature of the final oral examination. The MS program has no foreign language requirement unless the student's advisory committee stipulates otherwise.

## > Program of Study

Before completing 18 hours of graduate credit, usually before the end of their second term of residency, the student must select an area of concentration, develop a program of study, and submit it to the advisory committee, department head, and Graduate School for approval.

Each area of concentration has background requirements that must be completed either with acceptable courses taken for a prior degree or with additional courses while enrolled as an MS candidate at OSU. A total of 45 graduate credit hours (500 level or greater) are required to complete the MS degree. Courses taken to meet the minimum educational background may not be used to meet this requirement.

## > Graduate Core

All graduate students in Forest Resources must 1) complete required graduate core courses, and 2) meet the requirements of one area of concentration. The required graduate core courses are:

- FOR 561 (Forest Policy Analysis)
- One additional course in the FES or FERM Departments taught exclusively at the graduate level.
- Two additional College of Forestry graduate courses (exclusive of FS 521).
- At least one of the credits earned in the seminar requirements listed in the concentrations below (FOR 507) should be one in which the student gives an oral presentation describing their thesis.

## > Forest Resources Areas of Concentration

Students may select from a variety of existing areas of concentration. Examples of MS programs in various concentrations are described below. **Note:** These are examples only; programs may vary as approved by the student's advisory committee and the department head. Students may, under the direction of their major professor, and with the approval of their advisory committee and the department head, design a concentration to fit their individual needs.

## Forest Biometrics/Modeling Concentration

The specialization of Forest Biometrics/Modeling develops the statistical, mathematical and associated computer software tools needed to collect and/or project the basic data needed to make intelligent management decisions. These tools include the application of sampling techniques to estimate static data from inventories of stands or forests, and the application of regression techniques to estimate dynamic data from models of the tree or stand.

### Minimum Educational Background

FOR 321	Forest Mensuration	5
FOR 322	Forest Models	3
FOR 443	Silvicultural Practices	4
MTH 251, 252	Calculus	4,4
MTH 253	Infinite Series and Sequences	4
ST 351, 352	Introduction to Statistical Methods	4,4

### Example Program Requirements

FOR 503	Thesis	8
FOR 507	Seminar	1,1
FOR 524	Forest Biometrics	3
FOR 525	Forest Modeling	3
FOR 561	Forest Policy Analysis	3
FS 521	Natural Resource Research Planning	2
FS 543	Advanced Silviculture	4
ST 521, 522	Introduction to Mathematical Statistics	4,4
ST 551, 552, 553	Statistical Methods	4,4,4

## Forest Management Concentration

### Minimum Educational Background

FOR 322	Forest Models	3
FOR 330, 331	Forest Resource Economics	4,4
FOR 341	Forest Ecology	4
FOR 442, 443	Silviculture Reforestation, Silvicultural Practices	4,4

### Program Requirements

FOR 503	Thesis	6-12
FOR 507	Seminar	2
FOR 534	Economics of the Forest Resource	3
FOR 561	Forest Policy Analysis	3
FS 521	Natural Resource Research Planning	2
ST 551, 552	Statistical Methods	4,4

### Additional Coursework

Approximately 13-19 graduate level credits in one or two related basic disciplines or resource management areas are required; applicable disciplines include Economics, Biometrics, Photogrammetry and Interpretation, Modeling, Remote Sensing/Geographic Information Systems (GIS), Operations Research, Management Science, Social Science, Silviculture, Policy, and Biology/Ecology. Resource Management areas include Forest, Range, and Wildlife Management.

## Applied Economics MA/MS Program Requirements

The Graduate Program in Applied Economics is offered by economists in several departments at Oregon State University, including FERM and FES. It is administered by the Graduate School. The program of study includes two areas of concentration, one of which may be designed by the student's committee and the student to address a specific research focus in forestry or elsewhere. Interested students are encouraged to contact participating faculty in the FES and FERM departments directly for more information. Requirements for the masters degree in Applied Economics are duplicated below. See the Program website for details:

[http://oregonstate.edu/dept/grad\\_school/economics/](http://oregonstate.edu/dept/grad_school/economics/)

### Core Courses

The core courses required of all M.A. and M.S. students are AREC/ECON 512 and AREC/ECON 513 (microeconomic theory); AREC/ECON 523 and AREC/ECON 525 (econometrics); and ECON 515 (macroeconomic theory).

### Areas of Concentration/Specialization

MA/MS students are required to complete one area of concentration/specialization with a minimum of 6 credits. Areas currently being offered by the Applied Economics program are International Trade, Public Health Economics, Resource and Environmental Economics, and Transportation Economics. An open area of concentration or the Applied-Economics concentration provides Master's students the option of taking a concentration identified and approved by their Program Committee. Students are required to obtain a B grade or above in each of the courses from the chosen concentration. Students will select additional credits for a Master's program of study totaling at least 45 credits.

### Resource and Environmental Economics

1. AREC 550 (Environmental Economics)
2. AREC 551 (Natural Resource Economics)
3. One of the following:
  - a. FOR 537 (Valuation of Non-market Resources)
  - b. FOR 534 (Economics of Forest Resources)

### International Trade

1. AREC 543 (Applied Trade Analysis)
2. One of the following:
  - a. FOR 535 (Markets and Prices in the Forest Sector)
  - b. AREC 643 (International Trade II)
  - c. Another 500-level course approved by the Student's Committee

### Transportation Economics

1. ECON 565 (Transportation Economics)
2. One of the following:
  - a. AREC 550 (Environmental Economics)
  - b. Another 500-level course approved by the Student's Committee

### Public Health Economics

1. H 532 (Economic Issues in Health and Medical Care)
2. H 533 (Health Systems Organization)

### **Thesis/ Non-thesis options**

Thesis or research-in-lieu-of thesis is required. Additional information on university requirements for the thesis is provided by the Graduate School in its "guidelines for completing our thesis." Students who are in good standing in the OSU Applied Economics program may substitute an approved research project for the Master's thesis. All requirements for non-thesis Master's degrees set by the Graduate School must be satisfied.

### **Graduate School Requirements**

All Oregon State University Graduate School requirements must be satisfied. See general requirements for graduate degrees at "Policies Governing All Graduate Programs" and "Policies Governing Master's Degree Programs."

### **Silviculture Concentration**

#### **Minimum Educational Background**

BOT/ENT 415	Forest Insect and Disease Management	5
CSS 305, 306	Soils	4,1
FOR 220	Aerial Photo Interpretation & Management	4
FOR 341	Forest Ecology	4
FOR 442, 443	Silviculture	4,4
ST 351	Statistics	4

#### **Program Requirements**

FOR 503	Thesis	6-12
FOR 507	Seminar	2
FOR 534	Economics of the Forest Resource	3
FOR 543	Advanced Silviculture	4
ST 551, 552	Statistical Methods	4,4

#### **Additional Course Work**

Approximately 20 hours of graduate level courses selected from the list below or from botany, Soils, Geography, or Statistics Departments.

FE 530	Watershed Processes	4
FE 535	Watershed Quality and Forest Land Use	3
FOR 524	Forest Biometrics	3
FOR 525	Forest Modeling	3
FOR 536	Wildland Fire Science and Management	4
FOR 546	Wildland Fire Ecology	4
FS 523	Natural Resource Data Analysis	4
FS 545	Advanced Forest Community Ecology	4
FS 553	Forest Wildlife Habitat Management	4
FS 561	Physiology of Woody Plants	3

## Forest Social Science Concentration

The Master of Science in Forest Resources with a concentration in Forest Social Science is designed for students wishing to explore linkages among humans, society, and natural resources upon which humans and society depend. Students in this concentration must develop proficiency in the following areas: 1) Social theory relevant to the student's research, 2) Research methods appropriate to the research, 3) Forestry, to ensure an adequate grounding in the field and, 4) Other coursework relevant to the student's particular research topic. Within the framework of these 4 areas, and with guidance from the major professor and graduate committee, students have considerable flexibility in designing their curriculum to meet their needs. A total of 45 credit hours are required including up to 12 thesis credits. Minimum educational background is determined on an individual basis; post-baccalaureate coursework may be needed to prepare some students for entry into the program. Following are examples of courses in each of the 4 proficiency areas:

**Example Courses** (Note: These courses are illustrative only — actual courses taken will be determined through consultation with each student's major professor and graduate committee):

### Social Theory (minimum 6 credits):

ANTH 575	Theory of Culture	3
ANTH 577	Culture of Ecology	3
COMM 540	Theories of Conflict and Conflict Management	3
PHL 570	Philosophy of Science	3
PS 576	Science and Politics	4
SOC 513	Sociological Theory	3

### Research Methods (minimum 9 credits):

ANTH 591	Ethnographic Methods	1-3
FOR 522	Research Methods in Social Science	4
FOR 523	Quantitative Analysis in Social Science	4
FS 521	Natural Resource Research Planning	2
GEO 553	Resource Evaluation Methods	3
SOC 519	Applied Research Methods	3
ST 511, 512	Methods of Data Analysis	4,4

### Forestry Foundation (minimum 8 credits):

FE 530	Watershed Processes	4
FOR 534	Economics of the Forest Resource	3
FOR 537	Valuation of Non-Market Resources	3
FOR 561	Forest Policy Analysis	3
FS 543	Advanced Silviculture	4
FS 553	Forest Wildlife Habitat Management	4
FW 536	Wildland Fire Science	3

### **Example Topical Areas:**

#### **Forest Policy**

FOR 561	Forest Policy Analysis	3
FOR 562	Natural Resource Policy & Law	3
FOR 564	Private Forests in Society	4
GEO 552	Principles & Practices of Rural & Resource Planning	3
PS 574	Natural Resource Policy & Bureaucratic Politics	4

#### **Forest Recreation**

BA 592	Consumer Behavior	3
FOR 507	Seminar	1-16
FOR 537	Valuation of Non-Market Resources	3
FOR 551	History and Cultural Aspects of Recreation	4
FOR 553	Nature Based Tourism	3
FOR 558	Concepts of Forest Recreation Planning & Management	4
FOR 593	Environmental Interpretation	4

### **Forestry/Wildlife Concentration**

This concentration is designed for students interested in topics that involve both forestry and wildlife science as an interdisciplinary approach to attaining sustainability of both forest and wildlife resources. Additional coursework in forestry, statistics, spatial analysis, and/or the biological sciences may be suggested.

#### **Example Program Requirements**

FOR 503	Thesis	6
FOR 507	Seminar	1
FOR 521	Advanced GIS Applications in Forestry	3
FOR 561	Forest Policy Analysis	3
FS 521	Natural Resource Research Planning	2
FS 553	Forest Wildlife Habitat Management	4
FW 551	Avian Conservation and Management	5
FW 558	Management of Big Game Animals	4
FW 563	Conservation Biology of Wildlife	3
FW 581	Wildlife Ecology	3
GEO 546	Advanced Landscape Ecology	3
PHL 543	World Views and Environmental Values	3
RNG 550	Landscape Ecology and Analysis	8
ST 511, 512	Methods of Data Analysis	1

#### **Additional Seminar**

### **Remote Sensing, GIS, and Landscape Ecology Concentration**

#### **Example Program Requirements**

FOR 521	Spatial Analysis of Forested Landscapes	3
GEO 541	Spatio-temporal Variation in Ecology and Earth Science	4
FOR 546	Wildland Fire Ecology	3
FW 579	Wetlands and Riparian Ecology	3
GEO 546	Advanced Landscape Ecology	3

GEO 565	Geographic Information Systems	3
GEO 566	Digital Image Processing	3
RNG 550	Landscape Ecology and Analysis	3
ST 511, 512, 513	Methods of Data Analysis	4,4,4
FOR 507	Seminar	2

**Additional Coursework**

Additional coursework (in an area of specialization such as ecology, statistics, wildlife) 5

FOR 507	Thesis	6-12
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## **MS, Natural Resource Education and Extension (NREE)**

The Master of Science in Forest Resources with a concentration in Natural Resource Education and Extension is intended for people who want to help bridge the information gap that exists between natural resource experts and a variety of client groups, ranging from resource managers to members of the general public. This degree program is intended primarily for people who already possess a Bachelor's degree in Natural Resources (especially land-based resources such as Forestry, Wildlife, and Range) and who wish to further develop their communication and education skills; however, others are welcome to apply if they are willing to develop a sufficient background in the technical aspects of land-based natural resource management. Further, the program is aimed primarily at those who wish to educate adults, although those primarily interested in younger audiences are encouraged to explore options with interested faculty. Graduates of this program might well find themselves working as educators in the Extension Service, as Public Affairs officers in governmental agencies or private organizations, as Education Specialists for arboreta or other natural resource education centers, or as liaisons working between policy makers and the public.

Before completing the MS in Natural Resource Education and Extension, students will be expected to understand the fundamental techniques, concepts, issues, and philosophies associated with the management of forests and other land-based natural resources. A minimum set of undergraduate courses that addresses this requirement is described below under "Minimum Educational Background". However, additional courses may be required depending on the student's career goals. Further, students will be expected to develop knowledge and skills in two separate areas at the graduate level: 1) Land-based natural resource management and, 2) Education and communications. Course requirements are described below under Graduate Program Requirements.

The MS in Natural Resource Education and Extension includes two options for the final project:

**Thesis:** Normally takes two years to complete and includes original research into some aspect of the education or communication process as it applies to natural resources.

**Non-thesis:** Normally takes two years to complete and includes a final project in which the student designs, executes, and describes an educational or communication project aimed at a specific natural resource problem or issue.

## Admission to the Program

A Bachelor's degree in any field is acceptable for admission to the program. However, a substantial background in Natural Resource Management is essential for graduate course work in this field (see Minimum Educational Background). Students entering the program without this background, or wishing to specialize in fields that require detailed knowledge in fundamental skill areas (e.g., Extension) may require additional time to complete the degree.

## Minimum Educational Background

To be effective, a natural resource educator must understand the fundamental terms, concepts, techniques, and philosophies associated with the management of forests and other natural resources. Before completing the MS in Natural Resource Education and Extension, each student must develop a background equivalent to the following list (substitutions may be made on a case-by-case basis, subject to approval by the student's advisory committee). Most of these courses are undergraduate in nature and will not satisfy the Graduate Program Requirements.

<u>Credits</u>	<u>Topic</u>
3	General Ecology (e.g., forest, wildlife, range)
3	Management of Natural Systems (manipulation of biological systems to accomplish human objective — e.g., silviculture, range management, wildlife management)
3	Natural Resource Economics (e.g., forest, recreation, range, agriculture)
3	Forest or Natural Resource Policy
3	Natural Resource Measurements (e.g., forest, range, wildlife, recreation)
3	Resource Protection (e.g., insects, disease, fire, watershed)

## Program of Study

Before completing 18 hours of graduate credit (usually before the end of the second term of residency), the student must develop a program of study and submit it to his or her major professor and advisory committee, department head, and Graduate School for approval. A minimum of 45 graduate credit hours (500 level or greater) is required to complete the MS in Natural Resource Education and Extension Courses taken to meet the Minimum Educational Background may not be used to meet this requirement.

## Graduate Program Requirements

The intent of this requirement is two-fold: 1) To ensure that graduates understand the fundamental concepts, principles, and techniques associated with the management of forests and other land-based natural resources and, 2) To ensure that graduates understand the fundamental

concepts, principles, and techniques associated with design and delivery of effective educational programs. Students who select this graduate program are likely to have diverse career interests that require significantly different types of academic preparation. In addition, they may enter the program with dramatically different educational backgrounds. Therefore, each student's graduate coursework must be carefully planned with the student's major professor and advisory committee. It is entirely possible that two students with diverse career interests will complete this degree program with dramatically different sets of courses. For example, students interested in Forestry Extension might need stronger backgrounds in the fundamental technical skills of forestry than students interested in being education specialists for an urban arboretum, and students interested in public relations might need stronger backgrounds in mass media communications than students interested in community college education. With these broad goals in mind, each student must successfully complete the following graduate-level courses (or substitutes approved by the student's advisory committee), in addition to any courses taken to fulfill the Minimum Educational Background requirements.

**Natural Resource Requirement**

FOR/FS 507	Seminar*	2
Other	Natural Resource Electives**	12
<b>Total</b>		<b>14</b>

\* At least one of the credits earned in the above seminar requirement should be an oral presentation describing the student's project or thesis.

\*\* Courses numbered 500 or greater. At least 6 credits must come from within the College of Forestry. More than 6 credits may be required of students not possessing an undergraduate degree in forestry.

**Education and Communication Requirement**

Students must select at least 18 credit hours from the following list of courses. Substitutions may be made, but must be approved in advance by the student's major professor.

**Program Design, Development, and Delivery**

*Select at least courses from this list:*

AED 552	Program Organization and Management	3
AED 553	Applied Instructional Strategies	3
AED 554	Micro-Teaching	3
AHE 530	Learning and Workplace Cultures	3
AHE 531	Instructional Systems Design I	3
AHE 532	Instructional Systems Design II	3
AHE 533	Workplace Learning Needs Assessment	3
AHE 539	Designing Training Documentation	3
AHE 547	Instructional Strategies for Adult Learners	3
SED 571	Technology and Pedagogy I	1
SED 572	Technology and Pedagogy II	1

## Analytical Techniques/Program Assessment/Program Evaluation

Select at least 2 courses from this list:

AED 533	Rural Survey Methods	3
AHE 562	Introduction to Research Methods in Education	3
FOR 522	Research Methods in Social Science	4
SED 580	Research and Evaluation	3
SED 595	Assessment and Evaluation	3
SOC 515	Understanding Social Research	4
SOC 516	Conducting Social Research	4

## Learning Theory/Communication Theory

Select at least 2 courses from this list:

COMM 522	Small Group Communication Theory and Research	3
COMM 526	Intercultural Communication	3
AHE 521	Cross-Cultural Communications	3
AHE 553	Learning Theories	3
AHE 567	Leadership Development and Human Relations	3
AHE 578	Adult Development and Learning	3
PSY 554	Cognitive Development	3
SED 531	Overview of Free Choice Learning	3

## Electives (minimum of 7 credits required)

Students are required to take a minimum of 45 credit hours for the MS in Natural Resource Education and Extension. In addition, they are encouraged to take elective courses that will better prepare them to meet their career and educational objectives. Although no two programs will be the same, this will leave approximately 7 credits to use as electives. The variety of educational programs conducted by the College of Forestry (e.g., Forestry Extension, Continuing Education, the Forestry Media Center, and the Oregon Forestry Education Program) creates the opportunity for valuable real-world internships directly related to students in this program.

<i>Thesis:</i>	FOR 503	Thesis	6-9 credits
<i>Non-Thesis</i>	FOR 501	Research (in lieu of thesis)	6-9 credits

## Total Credits

Total credits in the program (depending upon student's background and course selection):

<i>Thesis:</i>	45-48 credits
<i>Non-Thesis:</i>	45-48 credits

## Project Paper for Non-Thesis Option

Each student electing the Non-Thesis option will design an educational or communications project that addresses the needs of a specific audience in the natural resource arena. The topic must be approved by the student's advisory committee and be of sufficient quality and depth to earn a grade of "B" or better for 6-9 credit of FOR 501 (Research).

## Time Limit

All course work, the thesis or project, and all examinations must be completed within a seven-year period. This requirement is strictly enforced.

## MS, Natural Resource Policy and Law (NRPL)

The Master of Science in Forest Resources with concentration in Natural Resource Policy and Law is intended for students with interests in the broad policy arena surrounding natural resource management, utilization, and protection. Emphasis is placed on advanced-level work in policy formulation, policy analysis, conflict resolution, and law. Students entering this program should have a Bachelor's degree with undergraduate coursework in disciplines pertinent to natural resource management such as ecology, economics, sociology, environmental sciences, communications, and statistics. Prior work experience in the fields of natural resources or public administration is also desirable.

The goal of this degree program is to prepare students for professional careers in the broad field of natural resource policy and management. Students completing this program should have a solid foundation of concepts and principles governing natural resource systems and the role that humans play in administering them. Graduates should be able to critically analyze information, integrate and synthesize policy options and implications, and collaborate and communicate effectively.

The program is non-thesis, but requires an internship (or equivalent experience) and project paper involving some aspect of natural resource policy and law. In addition, a set of prescribed courses, options, and electives must be completed. The program, totaling 45 graduate credits, is achievable in one year, provided a full course load is taken during the academic year and the internships and project paper are completed concurrently during the following summer.

### Program Requirements

All students must complete at least four courses at the graduate level in the College of Forestry.

#### **Analytical Methods**

One of the following course sequences in Statistical Analysis, Qualitative Analysis or Spatial Analysis must be completed:

#### **Statistical Analysis (select one course from this list):**

ST 511, 512	Methods of Data Analysis	4,4
or ST 551, 552	Statistical Methods	4,4

#### **Qualitative Analysis:**

SOC 516	Conducting Social Research	3
and SOC 565	Qualitative Sociology	3
or SOC 519	Applied Research Methods	3

**Spatial Analysis:**

GEO 544	Remote Sensing	3
and GEO 565	Geographic Information Systems and Science	3
or GEO 569	Topics in Geographic Techniques	3
or FOR 521	Advanced GIS Applications in Forestry	3

**Law**

The following course or its equivalent must be completed:

FOR 562	Natural Resource Policy and Law	3
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One of the following courses or their equivalent must be completed:

AREC 532	Environmental Law	4
AREC 553	Public Land and Resource Law	4
FOR 563	Environmental Policy and Law Interactions	3
SOC 548	Law and Society	3

Other graduate courses pertinent to this category may be substituted as approved by the student's graduate committee.

**Policy**

The following course or its equivalent must be completed:

FOR 561	Forest Policy Analysis	3
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Two of the following courses or their equivalent must be completed:

ANTH 581	Natural Resources and Community Values	3
ECON 539	Public Policy Analysis	4
PHL 540	Environmental Ethics	3
PS 574	Bureaucratic Politics	4
PS 575	Environmental Politics and Policy	4
PS 576	Science and Politics	4

Other courses pertinent to this category may be substituted as approved by the student's graduate committee. Examples include seminars and "Special Topics" course such as FW 699 — Ecological Policy.

**Conflict Management Mediation**

One of the following courses or their equivalent must be completed:

ANS 585	Consensus and Natural Resources	3
COMM 512	Topics in Speech Communication	3
COMM 540	Theories of Conflict and Conflict Management	3
COMM 542	Bargaining and Negotiation Processes	3
COMM 544	Third Parties in Dispute Resolution/Mediation	3

Other courses pertinent to this category may be substituted as approved by the student's graduate committee.

**Seminar**

The seminar listed below (FOR 507) should be one in which the student gives an oral presentation describing their project paper.

FOR 507	Project presentation or equivalent	1
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**Internship**

Each student will complete a 2-3 month internship in a real-world setting in which natural resource law or policy issues are involved. This requirement may be waived at the discretion of the student's advisory committee if the student already has substantial experience in this area.

FOR 510 (TBA) Internship 0-9

**Project Paper**

Each student will prepare a paper on a topic concerning an issue involving natural resource policy, planning, or law. The topic must be approved by the advisory committee and the paper must be of sufficient quality and depth to earn, by unanimous agreement of the committee, a grade of "B" or better.

FOR 506 Projects 1

**Electives**

Sufficient elective credits (1-15), selected from courses listed above or others approved by the student's advisory committee, must be completed to bring the total graduate credit for the program to a minimum of 45 hours.

**Time Limit**

Coursework and project must be completed within a seven-year period. This requirement is strictly enforced.

## Doctor of Philosophy (PhD)

The doctoral program in Forest Resources is intended for persons seeking careers in teaching and research. The program emphasizes strong research specialization while maintaining an understanding and appreciation of broader management and resource-use issues. Specialized areas of concentration for thesis research include Forest Biometrics, Applied Economics, Forest Modeling, Forest Operations Research/Management Science, Forest Social Science, Forestry/Wildlife, Remote Sensing and GIS, and Silviculture.

### > Admission to the Program

Applicants for the PhD degree must meet requirements of the Graduate School (see OSU Graduate Catalog) in addition to those of the department. An applicant generally must hold a Bachelor's degree in Forestry or a related area from an institution accredited by the Society of American Foresters and have a high scholastic record (a grade point average of 3.00 or higher). Students are encouraged to complete a Master's degree before entering the program. In rare cases an applicant who does not meet these requirements may be provisionally admitted where, in the opinion of the Graduate Admission Committee and department head, his or her accomplishments indicate high potential for success as a PhD candidate.

The department head assigns a major professor to each student when admitted, making every effort to accommodate the student's expressed interests within the limitations of faculty work load and research programs.

### > Program of Study

The cumulative equivalent of one full-time academic year of regular non-blanket coursework (defined as 36 credits) must be included in a doctoral program.

As soon as possible after the student's arrival at OSU, but within no more than one year, an advisory committee is selected jointly by the major professor and student. It will consist of five members of the graduate faculty: Two from the student's home department (one being the major professor), one from each declared minor field, and a graduate council representative. At least one member should be from a department outside the College of Forestry. The department head is a de facto member of all doctoral committees.

During the student's first year of enrollment, the committee and the student will select an area of concentration, develop a program of study, and submit it to the department head and Graduate School for approval.

### > **Minimum Educational Background**

Each student must demonstrate competence in broad areas of forestry, knowledge through the completion of appropriate coursework for a prior degree or while in residence at OSU, as determined by his/her advisory committee. The background courses may be different for each area of concentration. All concentrations require background in Forest Ecology, Silviculture, Forest Policy, Applied Economics. and Statistics.

All graduate students must complete FOR 561, Forest Policy Analysis, and one additional course in the Forest Engineering, Resources and Management Department taught exclusively at the graduate level, plus two additional College of Forestry graduate courses (exclusive of FS 521).

### > **Competence**

In addition, each student's program will be designed to ensure competence in the following areas:

1. Coursework and examinations in the field(s) of concentration,
2. Research methods,
3. Seminar,
4. Breadth requirements.

### > **Research**

*Statistics:* Coursework in general probability theory and statistical inference equivalent at a minimum to ST 511, 512 and one of the following: ST 513, 553, or 555. Social Science students may also choose from SOC 516 or SOC 518. ST 557 (or equivalent) is also required.

*Computer Science:* Working knowledge of, or coursework in, programming and computer systems.

*Research Methods:* Coursework in investigative techniques appropriate to the chosen field(s) of concentration as approved by the advisory committee. This must be in addition to those courses selected to fulfill the Statistics and Computer Science requirements. At the discretion of the committee, these may or may not include a foreign language.

### > **Research Project Planning**

Including at a minimum FS 521, Natural Resource Research Planning (or an equivalent course).

### > **Seminar**

Each student must complete two credit-hours of seminar and must give at least one seminar on his/her own research while in residence at OSU. Options for completing the seminar requirements are FOR 607, FS 607, or other arrangements approved by the advisory committee.

### > **Breadth Requirement**

A PhD program involves a process of concentration in an effort to acquire high level of skill and competence in relatively narrow disciplinary areas. In addition, successful application of these skills requires that individuals have or develop some perspective on the place of their work in the broader social and environmental context. Our faculty expect that at a minimum each doctoral candidate should understand who will use his/her work and for what purposes, how these applications might affect society and the natural environment, and what controversies may attend these applications.

### > **Areas of Concentration**

Each student in conjunction with his/her committee will specify, at the time of filing a program of study, a dissertation research area, and one or more areas of concentration within that area. This selection will be recorded in a memorandum of understanding between the committee and the student and will be attached to the departmental copy of the program of study in the student's file. It is possible that in some dissertation research areas the faculty will require more than one area of concentration.

**Specialization details which follow are sample programs for PhD degrees in Forest Resources. Actual requirements for these areas of concentration are set individually by the student's advisory committee.**

## **REMOTE SENSING, GIS, & LANDSCAPE ECOLOGY CONCENTRATION**

This concentration is designed for students interested in studying forests at the stand, landscape, or global level. This program requires a strong background in methodologies of remote sensing, photogrammetry, statistics, field work, and computer mapping. Additional coursework in forest management and/or the biological sciences may be suggested.

### Example Program Requirements

FOR 521	Advanced GIS Applications in Forestry	3
FS 553	Forest Wildlife Habitat Management	4
FW 536	Wildland Fire Science	3
FW 579	Wetlands and Riparian Ecology	3
GEO 546	Advanced Landscape Ecology	3
GEO 565	Geographic Information Systems	3
GEO 566	Digital Image Processing	3
RNG 550	Landscape Ecology and Analysis	3
ST 511, 512, 513	Methods of Data Analysis	4,4,4
Additional coursework (in an area of specialization such as ecology, statistics, wildlife)		5

### SILVICULTURE CONCENTRATION

The Silviculture concentration provides students with a sound biological basis and a grounding in fundamental areas of forest management. In this program, students prepare themselves for research, problem solving, and management related to forests at the stand or forest level; therefore, courses in both management and biological sciences are required.

Application and analysis of silvicultural systems and prescriptions; analyzing and predicting effects of stand tending and silvicultural treatments on stand growth and development; silviculture-soils interactions.

#### Program Requirements

Specialization in an area related to silviculture, e.g., plant ecology, soil science, or biometrics, 9-18 hours.

FOR 524	Forest Biometrics	3
FOR 525	Forest Modeling	3
FS 543	Advanced Silviculture	4
FS 545	Advanced Forest Community Ecology	4
FS 553	Forest Wildlife Habitat Management	4
FS 646	Ecosystem Analysis and Application	4

#### Recommended Courses

FOR 536	Wildland Fire Science and Management	4
FOR 546	Wildland Fire Ecology	4
FS 548	Biology of Invasive Plants	3
FS 561	Physiology of Woody Plants	3

## FORESTRY/WILDLIFE CONCENTRATION

This concentration is designed for students interested in topics that intersect forestry and wildlife science as an interdisciplinary approach to attaining sustainability of both forest and wildlife resources as well as entire ecosystems. Additional coursework in forestry, statistics, spatial analysis, and/or the biological sciences may be suggested.

### Example Program Requirements

FOR 503	Thesis	36
FOR 507	Seminar	1
FOR 521	Advanced GIS Applications in Forestry	3
FOR 561	Forest Policy Analysis	3
FS 521	Natural Resource Research Planning	2
FS 545	Advanced Forest Community Ecology	4
FS 553	Forest Wildlife Habitat Management	4
FS 646	Ecosystems Analysis and Application	4
FW 536	Wildland Fire Science	3
FW 551	Avian Conservation and Management	5
FW 558	Management of Big Game Animals	4
FW 563	Conservation Biology of Wildlife	3
FW 581	Wildlife Ecology	3
GEO 546	Advanced Landscape Ecology	3
PHL 539	Philosophy of Nature	3
PHL 543	World Views and Environmental Values	3
RNG 550	Landscape Ecology and Analysis	3
ST 511, 512, 513	Methods of Data Analysis	4,4,4
	Additional Seminar	1

*Additional coursework may be suggested (in forestry and/or an area of specialization).*

FE 640	Special Topics: Advanced Heuristic Techniques	3
Any 500 or 600 level	Statistics course	

## Applied Economics PhD Program Requirements

The Graduate Program in Applied Economics is offered by economists in several departments at Oregon State University, including the FES and FERM. It is administered by the Graduate School. The program of study includes two areas of concentration, one of which may be designed by the student's committee and the student to address a specific research focus in forestry or elsewhere. Interested students are encouraged to contact participating faculty in the FES and FERM departments directly for more information. Requirements for the doctoral degree in Applied Economics are duplicated below. See the Program website for details: [http://oregonstate.edu/dept/grad\\_school/economics/](http://oregonstate.edu/dept/grad_school/economics/)

### Core Courses

The core courses required of all PhD students are AREC/ECON 512, AREC/ECON 513, AREC/ECON 612, and AREC/ECON 613 (microeconomic theory); AREC/ECON 611 (mathematics for economists); AREC/ECON 523, AREC/ECON 525, and AREC/ECON 526 (econometrics); and ECON 570 (macroeconomic theory). This list includes courses from the MA/MS core course list. Students who have completed courses from the MA/MS course list (or their equivalent from another institution) may enroll directly in the doctoral level courses. Students must pass written preliminary examinations in microeconomic theory and quantitative methods.

### Areas of Concentration/Specialization

PhD students are required to complete two areas of specialization with a minimum of 9 credits each. Areas currently being offered by the Applied Economics program are International Trade, Public Health Economics, and Resource and Environmental Economics. An open area of concentration or the Applied-Economics concentration provides Doctoral students the option of taking a concentration identified and approved by their Program Committee. Students are required to obtain a B grade or above in each of the courses from the chosen concentration. Students will select additional credits for a Doctoral program of study totaling at least 108 credits (including a minimum of 36 thesis credits).

### Resource and Environmental Economics

1. AREC 651 (Advanced Natural Resource Economics)
2. AREC 652 (Advanced Environmental Economics)
3. AREC 653 (Spatial Economics of Natural Resources)

### International Trade

1. AREC 543 (Applied Trade Analysis)
2. AREC 643 (International Trade II)
3. Select one course from the following:
  - a. FOR 535 (Markets and Prices in the Forest Sector)
  - b. Another 600-level course approved by the Student's Committee

### Public Health Economics

1. H 532 (Economic Issues in Health and Medical Care)
2. H 533 (Health Systems Organization)
3. H 605 (Reading and Conference in Health Economics)

### Dissertation and Other Degree Requirements

A doctoral dissertation is required. See information in the graduate catalog on this and other university requirements for PhD students at "Policies Governing All Graduate Programs" and "Policies Governing Master's Degree Programs." Useful information on steps for completing the dissertation is also provided by the Graduate School in its guidelines for completing your thesis.

## FOREST MEASUREMENTS CONCENTRATION

Applying statistical methods to forestry problems and developing biologically sound mensuration techniques to assist forest managers.

**Forest Biometrics:** Sampling Methods, Statistical Inference, Experimental Design. Forest Biometrics is designed for students interested in applying statistical methods to forestry-related problems. The recommended program incorporates many useful statistical tools and provides a sound foundation in statistical theory.

### Program Requirements

Qualifying examinations in both Statistical Inference and Theory administered by the Department of Statistics.

FOR 524	Forest Biometrics	3
FOR 525	Forest Modeling	3
ST 551, 552, 553	Statistical Methods	4,4,4
ST 555	Advanced Experimental Design	3
ST 557	Applied Multivariate Analysis	3
ST 561, 562, 563	Theory of Statistics	3,3,3
ST 565	Time Series and Spatial Statistics	3
ST 573	Ecological Sampling	3
ST 623	Generalized Regression Models I	3
ST 625	Generalized Regression Models II	3
ST 651, 652, 653	Linear Model Theory	3,3,3

**Forest Modeling:** Stand and tree dynamics, yield, and growth potential. Forest Modeling is designated for students interested in developing mensurational tools that are biologically sound and that are useful for answering questions faced by forest managers. The recommended program builds strength in available methodologies used to answer these questions.

### Program Requirements

Qualifying examination in both Statistical Inference and Theory administered by the Department of Statistics.

BOT 543	Plant Community Ecology	3
FOR 524	Forest Biometrics	3
FOR 525	Forest Modeling	3
FS 543	Advanced Silviculture	4
ST 535	Quantitative Ecology	3
ST 551, 552, 553	Statistical Methods	4,4,4
ST 561, 562, 563	Theory of Statistics	3,3,3
ST 565	Time Series and Spatial Statistics	3
ST 573	Ecological Sampling	3
ST 623	Generalized Regression Models I	3
ST 625	Generalized Regression Models II	3

### FOREST OPERATIONS RESEARCH/MANAGEMENT SCIENCE CONCENTRATION

This program is designed to provide a firm foundation for research and practice in the decision sciences as applied to forest management. Subject matter areas include harvest scheduling, economics of stand and forest management, economics of the firm, and related microeconomic fields. Basic coursework is drawn from economics, operations research and statistics.

### Program Requirements

#### *Educational Background*

Knowledge of the following areas based on previous coursework or experience: linear algebra, single- and multi-variable calculus, mathematical statistics (satisfied by ST 521, 522 or equivalent), and intermediate microeconomics (ECON 311 and 312 or equivalent).

#### *Course Requirements*

AREC 507	Introduction to Mathematical Economics	4
AREC 512, 513	Microeconomic Theory I, II	4,4
FE 640	Special Topics: Heuristic Techniques	3
ST 543	Applied Stochastic Models	3
ST 581	Linear Programming	3
ST 583	Nonlinear Optimization	3
ST 551, 552, 553	Statistical Methods	4,4,4
or ECON 523, 525, 526	Econometrics	4,4,4
or equivalent		

*Additional coursework drawn from the following list or as approved by the student's committee:*

ECON 611	Math for Economics	4
ECON 612, 613	Advanced Microeconomic Theory	4,4
ECON 625	Advanced Econometrics	4
ECON 627	Applied Micro-econometrics	4
FOR 535	Markets and Prices in the Forest Sector	3
IE 521, 522	Industrial Systems Optimization I, II	3,3

*Plus Department requirements as listed above (thesis, seminar, forest policy and research methods).*

## FOREST SOCIAL SCIENCE CONCENTRATION

The PhD in Forest Resources with a concentration in Forest Social Science aims to provide rigorous training for students pursuing careers in research and teaching in the human and social dimensions of natural resources. Students in this concentration must develop proficiency in the following areas: 1) Social theory relevant to the student's research, 2) Research methods appropriate to the research, 3) Forestry, to ensure an adequate grounding in the field, and, 4) Other coursework relevant to the student's particular research topic. Within the framework of these 4 areas, and with guidance from the major professor and graduate committee, student have considerable flexibility in designing their curriculum to meet their needs. Following are examples of courses in each of the 4 proficiency areas:

### Example Courses

*Note: These courses are illustrative only — actual courses taken will be determined through consultation with each student's major professor and graduate committee.*

#### Social Theory:

ANTH 575	Theory of Culture	3
ANTH 577	Cultural Ecology	3
COMM 540	Theories of Conflict & Conflict Management	3
PS 576	Science and Politics	4
PHL 570	Philosophy of Science	3
SOC 513	Sociological Theory	3

#### Research Methods:

ANTH 591	Ethnographic Methods	1-3
FOR 522	Research Methods in Social Science	4
FOR 523	Quantitative Analysis in Social Science	4
FS 521	Natural Resource Research Planning	2
GEO 553	Resource Evaluation Methods	3
SOC 519	Applied Research Methods	3
ST 511, 512	Methods of Data Analysis	4,4

#### Forestry Foundation:

FE 530	Watershed Processes	4
FOR 534	Economics of the Forest Resource	3
FOR 537	Valuation of Non-Market Resources	3
FOR 561	Forest Policy Analysis	3
FS 543	Advanced Silviculture	4
FS 553	Forest Wildlife Habitat Management	4
FW 536	Wildland Fire Science	3

#### Example Topical Areas:

##### Forest Policy:

FOR 561	Forest Policy Analysis	3
FOR 562	Natural Resource Policy and Law	3
FOR 564	Private Forests in Society	4
GEO 552	Principles & Practices of Rural & Resource Planning	3
PS 574	Natural Resource Policy & Bureaucratic Politics	4

**Forest Recreation:**

BA 592	Consumer Behavior	4
FOR 507	Seminar	1-16
FOR 537	Valuation of Non-Market Resources	3
FOR 551	History & Cultural Aspects of Recreation	3
FOR 553	Nature Based Tourism	4
FOR 558	Concepts of Forest Recreation Planning & Management	3
FOR 593	Environmental Interpretation	4

**> Breadth Requirement**

Satisfaction of this requirement will be judged in part by the student's performance on broad, integrative questions in the preliminary written and oral qualifying examinations. Prior to these examinations, however, it is the responsibility of the student's advisory committee to evaluate the student's breadth of background and understanding and recommend additional work if needed. Additional work may include (but need not be limited to) additional coursework, conduct of or attendance at seminars intended to provide a broadening experience, service as a teaching assistant, and/or organized Reading and Conference. The committee will submit the recommendation in writing to the department head and the departmental Graduate Affairs Committee for their review following the meeting to approve a program of study.

**> Written Preliminary Examination**

Each student will take a Forest Resource preliminary examination prior to advancement to candidacy for the doctorate degree. The examination is normally taken near the completion of the student's coursework. The examination consists of two parts: written and oral. The purpose of the exam is to provide comprehensive assessment of the student's competence in the theory, application, and research methods appropriate to the concentration area, and the dissertation topic selected within that area. It should assess the student's general understanding of these subjects as well as determine the student's capability for conducting original research. Demonstration of a general knowledge of the field of forest resources is also expected.

The departmental preliminary examination is in addition to any "preliminary" or "comprehensive" examinations required in various concentrations such as Economics and Forest Economics (Economic Theory, Quantitative Methods), Forest Biometrics (Statistical Inference, Statistical Theory), Forest Modeling (Statistical Inference), and Forest Operations Research/Management Science (Operations Research).

Successful completion of a Departmental Written Preliminary examination is a prerequisite to taking the comprehensive Oral Preliminary examination, the major professor will determine the format of the examination.

It may include timed sit-down or multi-day take-home examinations, either open- or closed-reference.

Once the examination format is established and specified in writing, the major professor will solicit written questions from the student's committee and other faculty as appropriate. After the exam has been completed, copies of the student's answers will be distributed by the major professor to all faculty contributing to the examination. Each question will be graded by its proposer. The grade categories will be Fail, Marginal Fail, Marginal Pass, Pass Satisfactory, and Pass Excellent. If the student Fails or Marginal Fails any question, then a second opinion on that question will be solicited from a qualified faculty member. Marginal Pass on the sum of the questions posed is deemed the minimum passing grade. Students will have the opportunity to retake the exam once. Results of the examination will be recorded in the student's file.

### **> Oral Comprehensive Preliminary Examination**

The Oral Comprehensive Preliminary Examination is conducted by the student's advisory committee. It usually occurs soon after the written exam has been passed, and may cover the same topics as the written exam, or it may extend into other relevant areas. The major goal of the exam is to ensure that the student has a comprehensive grasp of the general field of Forest Resources and is prepared to conduct original research in the chosen area of concentration. The examination must comply with all pertinent rules of the Graduate School, including provisions for scheduling.

The examination should be at least two hours in duration, no more than half of which should be devoted to specific aspects of the prospective Dissertation research. No more than one negative vote is allowed to successfully pass this exam, and it must be passed by the third time unless the Department stipulates fewer re-examinations. The results of this exam will be recorded in the student's file, and successful candidates will be advanced to candidacy for the Doctorate degree.

### **> Thesis and Final Oral Examination**

The student and his/her major professor, in cooperation with the advisory committee, will select an appropriate topic for the thesis research. A formal record of the proposed thesis, including the thesis title and a Prospectus or outline, is retained in the student's file. When the student completes the thesis, a final Oral Examination will be scheduled and conducted in accordance with policies and procedures of the Graduate School. The examination generally concentrates on the thesis research, but may cover other areas as well. When the final examination and thesis are completed

to the satisfaction of the Advisory Committee, and as stipulated by the rules of the Graduate School, the candidate is certified for award of the PhD degree. For the Doctoral degree, there is no time limit on course work but the continuous enrollment policy applies. At least one complete academic term must elapse between the time of the preliminary oral examination and the final oral examination. The final oral exam must be taken within 5 years after the preliminary oral exam. If more than 5 years elapse, the candidate will be required to take another preliminary oral exam.

**Important Note to Graduate Students on Permits and Authorization for Dissertation/Thesis Research Involving Humans, Animals and Plants**

Many types of research involving human subjects, animals and plants, both in the laboratory and through field studies, may require specific permits and authorization from University, State, and/or Federal agencies. Graduate students should work with their major professor and committee to ensure that all necessary permits have been obtained. Failure to do so may render all or part of the data collected through such studies unusable in the dissertation/thesis. A starting point for information on these topics is the OSU Office of Research Integrity at <http://oregonstate.edu/research/ori/index.htm>. Also see the Institutional Animal Care and Use Committee (IACUC) site which contains information on the use of vertebrate animals: rule compliance, approval process, permits for field studies and IACUC forms at <http://oregonstate.edu/research/ori/animal/use.html>. If work involves human subjects in any way you must review the materials and requirements of the Institutional Review Board (IRB) at <http://oregonstate.edu/research/ori/humansubjects.htm>. More information can be obtained by contacting Steve Durkee at 7-2762 in the Research Integrity Office [IACUC@oregonstate.edu](mailto:IACUC@oregonstate.edu).