



Sustainable Forest Management

Graduate Program

2012—2013

**Forest Engineering, Resources and Management
Department Office — 204 Peavy Hall
541-737-4952**

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Preface

Welcome from the Department of Forest Engineering, Resources and Management (FERM) faculty, staff, and students. This department is recognized throughout the world for excellence in graduate student education, creative problem-solving research, and innovative extended education. The faculty is a unique combination of forest scientists, engineers, and hydrologists who use forestry principles to solve complex forestry problems in forested watersheds and support sustainable forests. If you are interested in a graduate program in Sustainable Forest Management (SFM) with a concentration in 1) Forest Operations Planning and Management, 2) Forest Policy Analysis and Management, 3) Forest Biometrics and Geomatics, 4) Silviculture, Fire and Forest Health, 5) Forest Watershed Management, or 6) Engineering for Sustainable Forest Management, we invite you to further explore the opportunities described in this booklet.

Many FERM faculty members are recognized research leaders and several provide leadership in international scientific organizations. The faculty is pursuing a wide range of basic and applied research projects on topics that include: active forest management for healthy, sustainable forests, advanced technologies for forest measurements and modeling, forest supply chain management, wildland fire management, understanding and mitigating environment impacts of forestry activities, spatially-explicit landscape modeling, applications of emerging information technologies, forestry workforce issues, basic hydrological sciences, harvesting process engineering, and transportation system design.

In addition to the individual programs, we have developed several decision-support systems that are used by the practitioners and policy makers throughout the world. We are proud of the contributions these programs have made to the practice of sustainable forestry.

The collective strengths of the faculty, the university and associated research partners, and the Oregon environment make this a special place for pursuing a graduate education. The Corvallis community is a very pleasant place to live, and it is just a short distance to abundant recreational and cultural opportunities at the Oregon coast, the Coast Range and Cascade Mountains, and the metro areas of Portland, Salem, and Eugene.

This booklet provides only a brief overview of opportunities for graduate study within the FERM Department. If it attracts your interest, I encourage you to seek further information from the individual faculty in your area of interest.

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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, practitioners, 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.

Oregon State University's 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 — students and professors are on a first-name basis.

Oregon State's College of Forestry has been educating professionals for more than a century. We've earned a reputation as a world-class center of teaching and learning about forests and related resources. We offer undergraduate and graduate degrees in three departments: Forest Engineering, Resources and Management, Forest Ecosystems and Society, and Wood Science and Engineering. We also jointly offer an interdisciplinary undergraduate degree in Natural Resources and several interdisciplinary graduate programs. We operate about 14,000 acres of College Forests, most of it within minutes of campus. Oregon State University is a Land Grant, Sea Grant, Sun Grant, and Space Grant university, an NCAA Division I university, and a member of the Pac-10 athletic conference. It carries the prestigious ranking of a Carnegie Doctoral/Research-Extensive University.

Facilities and Programs

Oregonians have long recognized the importance of their forests and have provided outstanding facilities for the College of Forestry. Peavy Hall and Richardson Hall have state-of-the-art classrooms, computer and research laboratories, and designated self-learning and media centers for undergraduate and graduate students. Office space is provided for all Graduate 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 USDI Forest and Range Ecosystem Science of the U.S. Geological Survey also has a campus-based research program that complements and interacts with ours. 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 Forestry Extension and Outreach Education programs at OSU are among the finest in the nation – the world. Numerous Extension forestry specialists, county forestry agents, and other faculty provide educational opportunities, forestry information, and advice for practicing foresters, the forest industries, forest landowners, and other audiences.

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. Employers in the forest industries, universities, NGOs, and government agencies recognize this strength.

Research Forests

The College of Forestry has access to two major forest properties dedicated to research and education. The McDonald-Dunn, Spaulding, Marchel, and Blodgett forest properties, totaling about 14,000 acres, are owned by the College of Forestry as the results of gifts and are managed by the College for student learning, discovery and engagement. A growing number of state-wide “Discovery Forests” are managed to demonstrate innovative forestry practices for family forest owners and others. The 15,000-acre H. J. Andrews Experimental Forest on the Willamette National Forest 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.

Departments

Few forestry programs have the breadth represented by the three departments in the College of Forestry at OSU.

Forest Engineering, Resources and Management (engineering, planning and active management), **Forest Ecosystems and Society** (ecological and social sciences), and **Wood Science and Engineering** (wood industry management and wood science and technology) all offer undergraduate, graduate, extended education, and research programs.

Graduate Program in Sustainable Forest Management

The Sustainable Forest Management (SFM) graduate program is administered by the Department of Forest Engineering, Resources and Management. It emphasizes the management of forests to meet a defined set of ecological, economic and social criteria. The SFM program (MF, MS, PhD) provides a strong grounding in the principles and techniques of active management of forests to improve forest health



and condition while producing a full range of products and ecosystems services. The SFM program supports six areas of concentration.

1. **Forest Operations Planning and Management** – *Planning, organizing, and executing forest plans; enhancing supply chain efficiency and improving international competitiveness*
2. **Forest Policy Analysis and Management*** - *Analyzing tradeoffs in the forest and resource policy decision process; public land use policy; interpretations of regulations; markets for forest products; forest certification; theoretical and applied research related to ecosystem services*
3. **Forest Biometrics and Geomatics** - *Modeling tree and stand development; forest data sampling and monitoring methods; forest measurements and assessments; mapping and data management technologies*
4. **Silviculture, Fire, and Forest Health** - *Manipulating vegetation to achieve management objectives, from restoration to intensive timber production; fire ecology and fire management; forest ecosystem health*
5. **Forest Watershed Management** - *Understanding watershed conditions and processes in forested ecosystems and the effects of management activities; evaluating and improving soil and water quality and related practices and policies for forest operations*
6. **Engineering for Sustainable Forestry** – *Designing forest operations to achieve sustainable forest management objectives; ecological restoration operations; road design and construction*

*The Forest Policy Analysis and Management area of concentration is jointly sponsored by the Forest Engineering, Resources and Management department, Applied Economics graduate program, and the Agricultural and Resource Economics department.

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	http://oregonstate.edu/
College of Forestry	http://www.forestry.oregonstate.edu/
Dept of Forest Engineering, Resources & Management	http://www.ferm.forestry.oregonstate.edu/
OSU Graduate School	http://oregonstate.edu/dept/grad_school/
Office of Financial Aid	http://oregonstate.edu/financialaid/
Office of Admissions	http://oregonstate.edu/admissions/
University Housing & Dining Services	http://oregonstate.edu/uhsd/

Graduate School Catalog and Success Booklet

The Oregon State University Graduate Student catalog provides detailed information on University regulations and procedures. <http://catalog.oregonstate.edu/Default.aspx?section=Graduate>. The catalog also contains a complete list of graduate level courses offered by all departments at OSU. The Graduate School Student Success Booklet, found on their home page, is a compilation of regulation about graduate programs, examinations, and graduation requirements.

The University and Community

OSU is one of only ten US universities to hold the Land Grant, Sea Grant, Sun Grant, and Space Grant designation and is a Carnegie Doctoral/Research-Extensive university. Approximately 19,600 undergraduate and 4,400 graduate students are enrolled at OSU, including 2,600 U.S. students of color and 1100 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://oregonstate.edu/cw_tools/mailto/uhds/

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. Our Departmental 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 they has applied.

Application Procedures

Persons seeking admission to any of the Graduate programs of the department should follow these instructions from the Graduate School.

<http://oregonstate.edu/admissions/graduate-required-documents>

All admissions application forms are available on the Graduate School web site. Although they no longer provide printable forms, if you are unable to access a form because you lack reliable internet access or you do not have a credit card for payment, please send a message to them at graduate.admissions@oregonstate.edu or a note to their postal address to see if alternative arrangements can be made.

The Graduate school address is:

Oregon State University
Graduate School
300 Kerr Administration Building
Corvallis, Oregon 97331

Please send:

1. One **official** transcript from all previous academic work, undergraduate and graduate (grade slips and web printable transcripts or reports will not be accepted). All documents must be issued to the OSU Graduate School directly from the registrar or equivalent official office at your university. If the school is unable to send materials directly to OSU, they may give sealed documents to you to send. If the seal is unbroken when the envelope reaches OSU, the records will be accepted.

We suggest that a copy of unofficial transcripts also be sent directly to the FERM department office at 204 Peavy Hall, Corvallis OR 97331 in addition to the official transcripts sent to the Graduate School.

Note: Current and former Oregon State University students are not required to provide OSU transcripts. You may be required to provide transcripts from prior institutions attended if OSU is no longer in possession of the original transcript.

International Official academic records

All applicants are expected to provide **OFFICIAL** academic records for all post-secondary work completed.

2. All documents must be issued to OSU directly from the registrar or equivalent official office at your university. If the school is unable to send materials directly to OSU, they may give sealed documents to you to send. If the seal is unbroken when the envelope reaches OSU, the records will be accepted. **Faxed, scanned, and notarized copies are not considered official and will not be accepted.** Records certified by lecturers, professors, or other school officials who do not hold primary responsibility for maintaining the academic records of the institution **will not be accepted.**

Upon admission and prior to registration, the Graduate School must receive official confirmation of undergraduate degree completion shown by receipt of official academic records that include the degree earned and date granted. If your country issues them, we also require official degree certificates.

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

3. 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 our program. **These letters should be submitted directly to the Forest Engineering, Resources and Management department, not to University Admissions.**
4. Letter stating your objectives for graduate study and particular area of concentration. (See page 15.) Note: Please be as specific as possible. Limit your statement to one or two pages. The Departmental Graduate Admissions Committee relies heavily on your letter to determine the appropriate faculty reviewers for your application.
5. Office score slip 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.
6. **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), 213 (computer) or 80 (Internet Based Test). No subscore below 18 will be accepted on the IBT. Note: IELTS may be substituted for TOEFL (see below). TOEFL scores must be no more than 2 years old at the time of 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, 213 computer test or 80 internet based 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. To be considered for a fellowship students need to submit their applications no later than December 31st.

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.

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.

Department Fellowships

The Department of Forest Engineering, Resources and Management administers the Strachan and Lematta Fellowships. Priority will be given to applications completed and received by the Graduate Coordinator in the department by **January 1** for Department fellowship consideration.

College 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; College 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.

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 twelve 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. Professors may hire eligible graduate students to work on research projects, based on availability of funds. For additional information regarding student employment, please refer to the Student Employment Policy and Procedure Manual at: <http://oregonstate.edu/dept/budgets/STUEMPManual/STUEMPManual.htm>, or contact Human Resources personnel in the Forestry, Oceanic and Atmospheric Business Center, 154 Peavy Hall, Corvallis, OR 97331.

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/financialaid/>

Graduate Degrees in Sustainable Forest Management

The Sustainable Forest Management graduate program offers Master of Forestry (MF), Master of Science (MS), and PhD degrees. Students choose one of six areas of concentration:

1. **Forest Operations Planning and Management** – *Planning, organizing, and executing forest plans; enhancing supply chain efficiency and improving competitiveness*
2. **Forest Policy Analysis and Management*** - *Analyzing tradeoffs in the forest and resource policy decision process; public land use policy; interpretations of regulations; markets for forest products; forest certification; theoretical and applied research related to ecosystem services*
3. **Forest Biometrics and Geomatics** - *Modeling tree and stand development; forest data sampling and monitoring methods; mapping and data management technologies*
4. **Silviculture, Fire, and Forest Health** - *Managing vegetation to achieve management objectives, from restoration to intensive timber production; fire ecology and fire management; forest ecosystem health.*
5. **Forest Watershed Management** - *Understanding watershed conditions and processes in forested ecosystems and the effects of management activities; evaluating and improving soil and water quality and related practices and policies for forest operations*
6. **Engineering for Sustainable Forestry** – *Designing forest operations to achieve sustainable forest management objectives; ecological restoration operations; road design and construction*

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 (MF)

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 MF is not intended for those students wishing to pursue research interests or a higher degree.

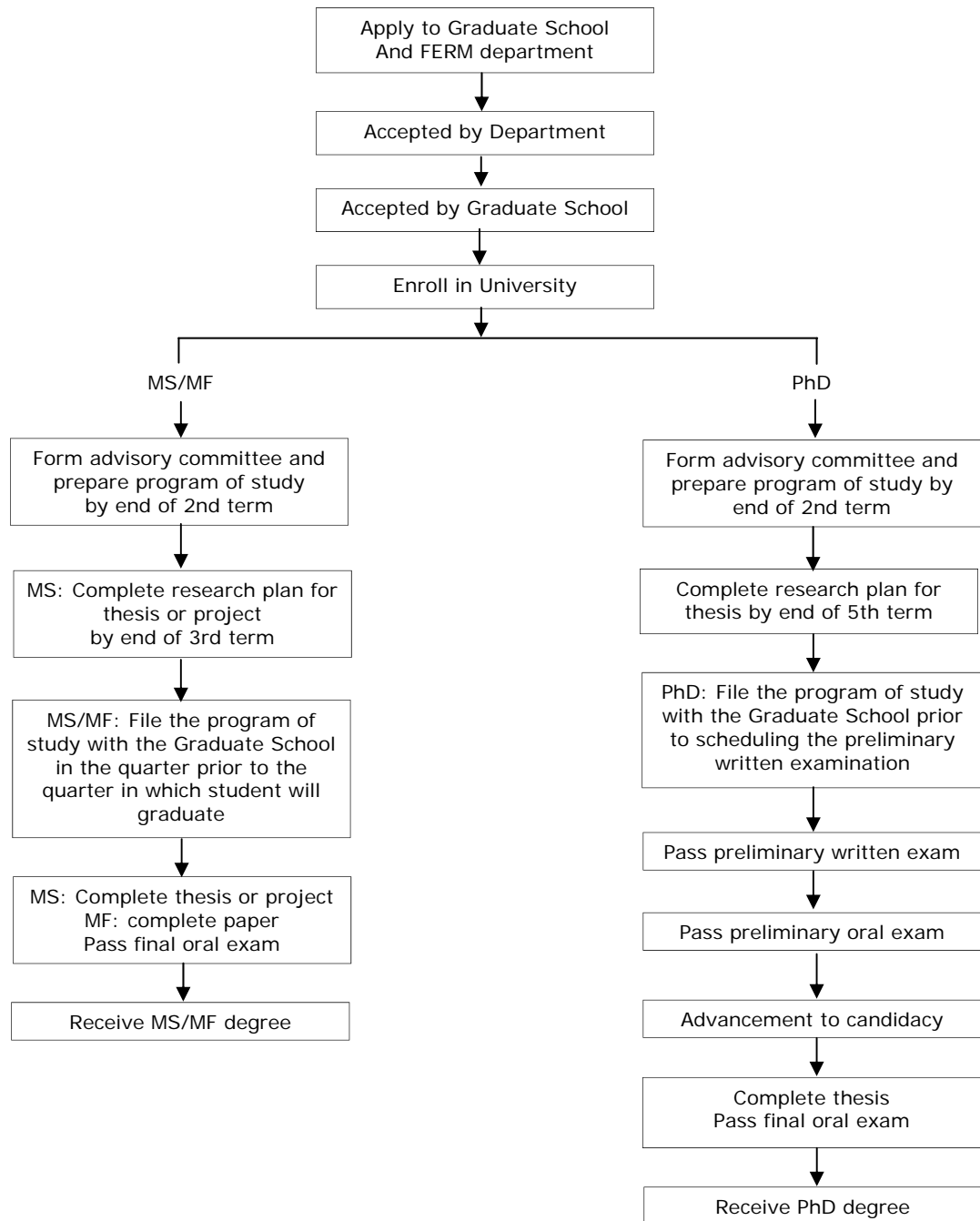
Master of Science (MS)

The degree Master of Science is designed for students who want two or more years of formal graduate work that includes the pursuit of an original research interest, perhaps preparing them for a higher degree.

Doctor of Philosophy (PhD)

The doctoral program in Sustainable Forest Management 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.

Flow Diagram for Graduate Program in Sustainable Forest Management



Master of Forestry in Sustainable Forest Management (MF)

The degree of Master of Forestry in Sustainable Forest Management 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 main objective is to improve students' knowledge of and competence in the principles and practice of active forest management to provide the full range of products and ecosystem services from forested landscapes. The MF is not intended for those students wishing to pursue research interests or a higher degree. MF students choose from one of the six concentrations from the Sustainable Forest Management program:

1. Forest Operations Planning and Management
2. Forest Policy Analysis and Management*
3. Forest Biometrics and Geomatics
4. Silviculture, Fire, and Forest Health
5. Forest Watershed Management
6. Engineering for Sustainable Forestry.

*The Forest Policy Analysis and Management area of concentration is jointly sponsored by the Forest Engineering, Resources and Management Department. Applied Economics Graduate Program and the Agricultural Resource Economics Department.

Admission to the Program

An applicant for the MF degree must meet requirements of the Graduate School (see OSU Graduate Catalog) in addition to those of the Forest Engineering, Resources and Management department. An applicant generally must hold a Bachelor's degree in Forestry or Forest Engineering 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 MF candidate. For students with limited preparation, 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. Such determinations are 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 MF student, the committee must consist of at least two other faculty members, including one or more from the College of Forestry.

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 within 15 weeks of the final examination but we encourage it to be filled 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. At least 50% of the coursework including project must be graduate level only (G).

Time Limit

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

Required Courses

All graduate students majoring in any concentration in the Sustainable Forest Management graduate program are required to undertake a 12/14-credit core in forest management and research methods consisting of:

- 1) *Sustainable Forest Management (3 credits total)*: An overview of the role of forests in providing products and ecosystems services around the world and criteria and indicators of sustainable forest management, forest policy and regulations.
- 2) *Critical Thinking and Research Methods (2-3 credits total)*: Lectures and seminars in research philosophies and methods with special emphasis on applied research;
- 3) *Graduate Level Statistics or Econometrics (6-8 credits total)*: Graduate level courses in either statistics or econometrics to be agreed upon by the student's committee and approved by Program Director.

Two required courses (6-8 credits total) from the concentration the student has chosen.

A 3 credit project, leading to a professional paper, that permits the student to pursue an interest in Sustainable Forest Management in their chosen concentration while providing practice in technical communication.

A 1 credit graduate seminar during the first year of their program to present their professional paper proposal and 1 credit of graduate seminar at the end of their program to present their professional paper.

The specific program will be developed by the student and student's committee and may include work in another field as needed to prepare the student for the MF project.

Example Programs

The specific program will be developed by the student and student's committee and may include work in another field as needed to prepare the student for the MS thesis. Example programs for concentration follow. A program of study must include a minimum of 50% of the coursework, including thesis at the graduate student only level (G). Classes where seniors are also permitted are designated as (g).

Forest Operations Planning and Management (MF)

An example of a program for an MF in Forest Operations Planning and Management might look like:

		Credits	Level
SFM Core:			
FOR 550	Sustainable Forest Management	3	G
FS 521	Natural Resource Research Planning	2	G
ST 511	Methods of Data Analysis I	4	g
ST 512	Methods of Data Analysis II	4	g
Required Concentration Courses:			
FE 547	Tactical and Operational Planning Techniques	3	g
FE 555	Forest Supply Chain Management	3	G
Example Pool of Supporting Courses (21-24 credits):			
FE 522	Forest Geomatics	4	g
FE 540	Forest Operations Analysis	3	g
FE 541	Production Planning	3	g
FE 552	Forest Transportation Systems	4	G
FE 560	Forest Operations Regulations and Policy Issues	3	g
FE 571	Harvesting Management	3	g
FOR 521	Spatial Analysis of Forested Landscapes	3	g
FOR 561	Forest Policy Analysis	3	G
FS 543	Advanced Silviculture	3	G
FS 553	Forest Wildlife Habitat Management	4	G
IE 521	Industrial Systems Optimization I	3	G
FE 640	ST/Heuristics for Combinatorial Optimization	3	G
Other			
FE 506	Project/Professional Paper	3	G
FE 507	Seminar	2	G
Total		45+	

Forest Policy Analysis and Management (MF)

An example of a program for an MF in Forest Policy Analysis and Management might look like:

	Credits	Level
SFM Core:		
FOR 550 Sustainable Forest Management	3	G
FS 521 Natural Resource Research Planning	2	G
Statistics Satisfied by AEC 523, AEC 525		
Required Concentration Courses:		
FOR 561 Forest Policy Analysis	3	G
AEC 512 Microeconomic Theory I	4	G
Example Pool of Supporting Courses (28-30 credits):		
FOR 534 Economics of the Forest Resource	3	G
FOR 536 Wildland Fire Science and Management	4	g
FOR 546 Wildland Fire Ecology	3	g
AEC 523 Statistics and Optimization for Economics	4	G
AEC 525 Applied Econometrics	4	G
FOR 521 Spatial Analysis of Forested Landscapes	3	g
One of:		
ST 581 Linear Programming	3	g
FOR 557 Techniques for Forest Resource Analysis	4	g
IE 521 Industrial Systems Optimization I	3	G
One of:		
PS 574 Natural Resource Policy & Bureaucratic Politics	4	g
FOR 562 Natural Resource Policy and Law	3	G
Other:		
FOR 503 Thesis/Professional Paper	3	G
FOR 507 Seminar	2	G
Total	45+	

Forest Biometrics and Geomatics (MF)

An example of a program for an MF in Forest *Biometrics* might look like:

		Credits	Level
SFM Core:			
FOR 550	Sustainable Forest Management	3	G
FS 521	Natural Resource Research Planning	2	G
ST 521	Introduction to Mathematical Statistics I	4	g
ST 522	Introduction to Mathematical Statistics II	4	g
Required Concentration Courses (6 credits, two courses):			
FOR 524	Forest Biometrics	3	G
FOR 525	Forest Modeling	3	G
Geomatics	Satisfied by a new or an existing geospatial course	3	G
Example Pool of Supporting Courses (18-20 credits):			
ST 551	Statistical Methods I	4	G
ST 552	Statistical Methods II	4	G
ST 553	Statistical Methods III	4	G
ST 571	Environmental Sampling	3	G
FS 543	Advanced Silviculture	3	G
FOR 561	Forest Policy Analysis	3	G
Other:			
FOR 506	Project/Professional Paper	3	G
FOR 507	Seminar	2	G
Total		45+	

Forest Biometrics and Geomatics (MF) continued

An example MF program in Forest *Geomatics* might look like:

		Credits	Level
SFM Core:			
FOR 550	Sustainable Forest Management	3	G
FS 521	Natural Resource Research Planning	2	G
ST 511	Methods for Data Analysis I	4	g
ST 512	Methods for Data Analysis II	4	g
Required Concentration Courses (two courses):			
FE 522	Forest Geomatics	4	g
FOR 524	Forest Biometrics	3	G
CE 513	GIS in Water Resources	3	g
Example Pool of Supporting Courses (18-20 credits):			
FOR 521	Spatial Analysis of Forested Landscapes	3	g
FE 515	Forest Road Engineering	3	g
FE 532	Forest Hydrology	4	G
FE 541	Production Planning	3	g
FE 549	Strategic and Tactical Planning Techniques	3	g
GEO 541	Spatio-Temporal Variation in Ecology & Earth Science	4	G
CE 562	Digital Terrain Modeling	4	G
GEO 580	Advanced GIS Applications in the Geosciences	4	G
GEO 544	Remote Sensing	4	g
GPH 640	Geodesy	4	G
GEO 546	Advanced Landscape Ecology	3	G
FOR 534	Economics of the Forest Resource	3	G
FOR 536	Wildland Fire Science and Management	4	g
Other:			
FE 506	Project/Professional Paper	3	G
FE 507	Seminar	2	G
	Total	45+	

Silviculture, Fire and Forest Health (MF)

An example of a program to address a forest restoration and management project might look like:

		Credits	Level
SFM Core:			
FOR 550	Sustainable Forest Management	3	G
FS 521	Natural Resource Research Planning	2	G
ST 511	Methods of Data Analysis I	4	g
Required Concentration Course:			
FS 543	Advanced Silviculture	3	G
At least one of:			
PS 574	Natural Resource Policy and Bureaucratic Politics	4	G
FOR 561	Forest Policy Analysis	3	G
FOR 562	Natural Resource Policy and Law	3	G
Example Pool of Supporting courses (26-28 credits):			
FE 532	Forest Hydrology	4	G
FE 535	Water Quality and Forest Land Use	3	G
FOR 520	Advanced Aerial Photos and Remote Sensing	3	g
FOR 521	Spatial Analysis of Forest Landscapes	3	g
FOR 536	Wildland Fire Science and Management	4	g
FOR 545	Ecological Restoration	4	g
FOR 546	Wildland Fire Ecology	3	g
FOR 554	Managing at the Wildland-Urban Interface	3	g
FS 515	Forest Insect and Disease Management	5	g
FS 545	Advanced Forest Community Ecology	4	G
FS 548	Biology of Invasive Plants	3	G
FS 553	Forest Wildlife Habitat Management	4	G
Other:			
FOR 506	Project/Professional Paper	3	G
FOR 507	Seminar	2	G
Total		45+	

Forest Watershed Management (MF)

A program of study in Forest Watershed Management might look like:

		Credits	Level
SFM Core:			
FOR 550	Sustainable Forest Management	3	G
FS 521	Natural Resource Research Planning	2	G
ST 511	Methods for Data Analysis I	4	g
ST 512	Methods for Data Analysis II	4	g
Required Concentration Courses:			
FE 532	Forest Hydrology	4	G
FE 535	Water Quality and Forest Land Use	3	G
Example Pool of Supporting Courses (20-22 credits):			
FE 538	Field Hydrology	3	G
FE 537	Hillslope and Watershed Hydrology	4	G
FE 530	Watershed Processes	4	g
FE 534	Forest Watershed Management	4	g
FS 646	Forest Ecosystem Analysis and Application	4	G
FE 536	Forest Erosion Processes	3	G
FE 550	Forest Operations Design I	3	g
FE 551	Forest Operations Design II	3	g
BEE 512	Physical Hydrology	3	G
FE 560	Forest Operations Regulations and Policy Issues	3	g
FOR 521	Spatial Analysis of Forested Landscapes	3	g
Other:			
FE 506	Project/Professional Paper	3	G
FE 507	Seminar	2	G
Total		45+	

Engineering for Sustainable Forestry (MF)

An example of a program for an MF in Engineering for Sustainable Forestry might look like:

		Credits	Level
SFM Core:			
FOR 550	Sustainable Forest Management	3	G
FS 521	Natural Resource Research Planning	2	G
ST 511	Methods for Data Analysis I	4	g
ST 512	Methods for Data Analysis II	4	g
Required Concentration Courses:			
FE 552	Forest Transportation Systems	4	G
FE 532	Forest Hydrology	4	G

Engineering for Sustainable Forestry (MF) continued

		Credits	Level
Example Pool of Supporting Courses (20-22 credits)			
FE 515	Forest Road Engineering	3	g
FE 516	Forest Road System Management	4	g
FE 535	Water Quality and Forest Land Use	3	G
FE 540	Forest Operations Analysis	3	g
FE 541	Production Planning	3	g
FE 550	Forest Operations Design I	3	g
FE 551	Forest Operations Design II	3	g
FE 570	Logging Mechanics	4	g
FE 571	Harvesting Management	3	g
FE 522	Forest Geomatics	4	g
GEO 580	Advanced GIS Applications in the Geoscience	4	G
FS 543	Advanced Silviculture	3	G
Other:			
FE 506	Project/Professional Paper	3	G
FE 507	Seminar	2	G
Total		45+	

Professional Paper

Students must complete a professional paper in order to provide experience in the communication of technical information and in synthesis of relevant material researched from the scientific literature. The topic is decided by the student and their 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 their entire program of study. Consideration of the professional paper may catalyze some 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, particularly if such experience was not obtained previously.

Master of Science in Sustainable Forest Management (MS)

The Master of Science in Sustainable Forest Management 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 MS program can be either a terminal degree or the first step toward a doctorate. The program provides an opportunity for independent research to be reported in a formal Master's Thesis. MS students choose from one of the six concentrations from the Sustainable Forest Management program:

1. Forest Operations Planning and Management
2. Forest Policy Analysis and Management*
3. Forest Biometrics and Geomatics
4. Silviculture, Fire, and Forest Health
5. Forest Watershed Management
6. Engineering for Sustainable Forestry

*The Forest Policy Analysis and Management area of concentration is jointly sponsored by the Forest Engineering, Resources and Management Department, Applied Economics Graduate Program and the Agricultural Resource Economics Department.

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 research/thesis topic, and in other academic matters — the major professor typically provides some or all of the funding for the research. 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). 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 a 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 and department head. 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. The program must be filed with the Graduate School within 15 weeks of the final examination but we encourage it to be filed by the end of the second term of residency.

Required Courses

All graduate students majoring in any concentration in the Sustainable Forest Management graduate program are required to undertake a 12-credit core in forest management and research methods consisting of:

1. *Sustainable Forest Management (3 credits total)*: An overview of the role of forests in providing products and ecosystems services around the world and criteria and indicators of sustainable forest management, forest policy and regulations.
2. *Critical Thinking and Research Methods (3 credits total)*: Lectures and seminars in research philosophies and methods with special emphasis on applied research.
3. *Graduate Level Statistics or Econometrics (6 credits total)*: Graduate level courses in either statistics or econometrics to be agreed upon by the student's committee and approved by the Program Director.

Two required courses (6-8 credits total) from the concentration the student has chosen.

A 6-12 credit thesis in Sustainable Forest Management in their chosen concentration.

A 1 credit graduate seminar during the first year of their program to present their thesis proposal and 1 credit of graduate seminar at the end of their program to present their thesis results.

Example Programs

The specific program will be developed by the student and student's committee and may include work in another field as needed to prepare the student for the MS thesis. Example programs for concentration follow. A program of study must include a minimum of 50% of the coursework, including thesis at the graduate student only level (G). Classes where seniors are also permitted are designated as (g).

Forest Operations Planning and Management (MS)

An example of a program for an MS in Forest Operations Planning and Management might look like:

		Credits	Level
SFM Core:			
FOR 550	Sustainable Forest Management	3	G
FS 521	Natural Resource Research Planning	2	G
ST 511	Methods for Data Analysis I	4	g
ST 512	Methods for Data Analysis II	4	g
Required Concentration Courses:			
FE 547	Tactical and Operational Planning	3	g
FE 555	Forest Supply Chain Management	3	G
Example Pool of Supporting Courses (18-24 credits):			
FE 522	Forest Geomatics	4	G
FE 540	Forest Operations Analysis	3	g
FE 541	Production Planning	3	g
FE 552	Forest Transportation Systems	4	G
FE 560	Forest Operations Regulations and Policy Issues	3	g
FE 571	Harvesting Management	3	g
FOR 521	Spatial Analysis of Forested Landscapes	3	g
FOR 561	Forest Policy Analysis	3	G
FS 543	Advanced Silviculture	3	G
FS 553	Forest Wildlife Habitat Management	4	G
IE 521	Industrial Systems Optimization I	3	G
FE 640	ST/Heuristics for Combinatorial Optimization	3	G
Other:			
FE 503	Thesis/Professional Paper	3	G
FE 507	Seminar	2	G
	Total	45+	

Forest Policy Analysis and Management (MS)

An example of a program to address a policy question in wildland fire management might look like:

	Credits	Level
SFM Core:		
FOR 550 Sustainable Forest Management	3	G
FS 521 Natural Resource Research Planning	2	G
Statistics Satisfied by AEC 523, AEC 525		
Required Concentration Courses:		
FOR 561 Forest Policy Analysis	3	G
AEC 512 Microeconomic Theory I	4	G
Example Pool of Supporting Courses (19-25 credits):		
FOR 534 Economics of the Forest Resource	3	G
FOR 536 Wildland Fire Science and Management	4	g
FOR 546 Wildland Fire Ecology	3	g
AEC 523 Statistics and Optimization for Economics	4	G
AEC 525 Applied Econometrics	4	G
FOR 521 Spatial Analysis of Forested Landscapes	3	g
One of:		
ST 581 Linear Programming	3	g
FOR 557 Techniques for Forest Resource Analysis	4	g
IE 521 Industrial Systems Optimization I	3	G
One of:		
PS 574 Natural Resource Policy and Bureaucratic Politics	4	G
FOR 562 Natural Resource Policy and Law	3	G
Other:		
FOR 503 Thesis/Professional Paper	3	G
FOR 507 Seminar	2	G
Total	45+	

Forest Biometrics and Geomatics (MS)

An example of a program for an MS in Forest *Biometrics* might look like:

SFM Core:		
FOR 550 Sustainable Forest Management	3	G
FS 521 Natural Resource Research Planning	2	G
ST 521 Introduction to Mathematical Statistics I	4	g
ST 522 Introduction to Mathematical Statistics II	4	g

Forest Biometrics and Geomatics (MS) continued

	Credit	Level
Required Concentration Courses (6 credits, two courses):		
FOR 524 Forest Biometrics	3	G
FOR 525 Forest Modeling	3	G
Geomatics Satisfied by a new or an existing geospatial course	3	G
Example Pool of Supporting Courses (18-24 credits):		
ST 551 Statistical Methods I	4	G
ST 552 Statistical Methods II	4	G
ST 553 Statistical Methods III	4	G
ST 571 Environmental Sampling	3	G
FS 543 Advanced Silviculture	3	G
Other:		
FOR 503 Thesis/Professional Paper	3	G
FOR 507 Seminars	2	G
Total	45+	

An example of a MS program in Forest **Geomatics**:

	Credits	
Level SFM Core:		
FOR 550 Sustainable Forest Management	3	G
FS 521 Natural Resource Research Planning	2	G
ST 511 Methods for Data Analysis I	4	g
ST 512 Methods for Data Analysis II	4	g
Required Concentration Courses (select two courses):		
FE 522 Forest Geomatics	4	g
FOR 524 Forest Biometrics	3	G
CE 513 GIS in Water Resources	3	g
Example Pool of Supporting Courses (18-24 credits):		
FOR 521 Spatial Analysis of Forested Landscapes	3	g
FE 515 Forest Road Engineering	3	g
FE 532 Forest Hydrology	4	G
FE 541 Production Planning	3	g
FE 549 Strategic and Tactical Planning Techniques	3	g
GEO 541 Spatio-Temporal Variation in Ecology & Earth Sci	4	g
CE 562 Digital Terrain Modeling	4	G
ST 535 Quantitative Ecology	3	g
GEO 580 Advanced GIS Applications in the Geosciences	4	G
GPH 640 Geodesy	4	G
GEO 546 Advanced Landscape Ecology	3	G

Forest Biometrics and Geomatics (MS) continued

		Credits	Level
FOR 534	Economics of the Forest Resource	3	G
FOR 536	Wildland Fire Science and Management	4	g
Other:			
FE 503	Thesis/Professional Paper	6-12	G
FE 507	Seminars	2	G
Total		45+	

Silviculture, Fire, and Forest Health (MS)

A program of study in Silviculture, Fire, and Forest Health might look like:

		Credits	Level
SFM Core:			
FOR 550	Sustainable Forest Management	3	G
FS 521	Natural Resource Research Planning	2	G
ST 511	Statistics I	4	g
ST 512	Statistics II	4	g
Required Concentration Course:			
FS 543	Advanced Silviculture	3	G
Example Pool of Supporting Courses (select 23-29 credits)			
BI 570	Community Structure and Analysis	4	G
BOT 543	Plant Community Ecology	3	G
BOT 550	Plant Pathology	5	g
FE 532	Forest Hydrology	4	G
FE 535	Watershed Quality and Forest Land Use	3	G
FOR 520	Advanced Aerial Photos and Remote Sensing	3	g
FOR 521	Spatial Analysis of Forest Landscapes	3	g
FOR 536	Wildland Fire Science and Management	4	g
FOR 545	Ecological Restoration	4	g
FOR 546	Wildland Fire Ecology	3	g
FOR 554	Managing at the Wildland-Urban Interface	3	g
FOR 561	Forest Policy Analysis	3	G
FOR 562	Natural Resource Policy and Law	3	G
FS 515	Forest Insect and Disease Management	5	g
FS 523	Natural Resource Data Analysis	4	G
FS 545	Advanced Forest Community Ecology	4	G
FS 548	Biology of Invasive Plants	3	G

Silviculture, Fire and Forest Health (MS) continued

		Credits	Level
FS 553	Forest Wildlife Habitat Management	4	G
ST 531	Sampling Methods	3	g
Other:			
FOR 503	Thesis/Professional paper	6-12	G
FOR 507	Seminar	2	G
Total		45+	

Forest Watershed Management (MS)

A program of study in Forest Watershed Management might look like:

		Credits	Level
SFM Core:			
FOR 550	Sustainable Forest Management	3	G
FS 521	Natural Resource Research Planning	2	G
ST 511	Methods for Data Analysis I	4	g
ST 512	Methods for Data Analysis II	4	g
Required Concentration Courses:			
FE 537	Hillslope and Watershed Hydrology	4	G
FE 530	Watershed Processes	4	g
Pool of Supporting Courses (16-22):			
FE 538	Field Hydrology	3	G
FE 534	Forest Watershed Management	4	g
FE 535	Water Quality and Forest Land Use	3	G
FE 532	Forest Hydrology	4	G
FS 646	Forest Ecosystem Analysis and Application	4	G
FS 547	Nutrient Cycling	3	G
BEE 512	Physical Hydrology	3	G
GEO 512	Igneous Petrology	4	G
GEO 487	Hydrogeology	4	G
CSS 523	Principles of Stable Isotopes	3	
Other:			
FE 503	Thesis/Professional Paper	6-12	G
FE 507	Seminar	2	G
Total		45+	

Engineering for Sustainable Forestry (MS)

An example of a program for an MS in Engineering for Sustainable Forestry might look like:

		Credits	Level
SFM Core:			
FOR 550	Sustainable Forest Management	3	G
FS 521	Natural Resource Research Planning	2	G
ST 511	Methods for Data Analysis I	4	g
ST 512	Methods for Data Analysis II	4	g
Required Concentration Courses:			
FE 552	Forest Transportation Systems	4	G
FE 532	Forest Hydrology	4	G
Example Pool of Supporting Courses (17-23 credits):			
FE 515	Forest Road Engineering	3	g
FE 516	Forest Road Management	4	g
FE 535	Water Quality and Forest Land Use	3	G
FE 540	Forest Operations Analysis	3	g
FE 541	Production Planning	3	g
FE 550	Forest Operation Design I	3	g
FE 551	Forest Operation Design II	3	g
FE 570	Logging Mechanics	4	g
FE 571	Harvesting Management	3	g
FE 522	Forest Geomatics	4	g
GEO 580	Advanced GIS Applications in the Geosciences	4	G
FS 543	Advanced Silviculture	3	G
Other:			
FOR 503	Thesis/Project Paper	6-12	G
FOR 507	Seminar	2	G
Total		45+	

Doctor of Philosophy in Sustainable Forest Management (PhD)

The doctoral program in Forest Resources is intended for persons seeking careers in teaching and/or research. The program emphasizes strong research specialization while maintaining an understanding and appreciation of broader management and resource-use issues. The dissertation 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. PhD students choose from one of the six concentrations from the Sustainable Forest Management program:

1. Forest Operations Planning and Management
2. Forest Policy Analysis and Management*
3. Forest Biometrics and Geomatics
4. Silviculture, Fire, and Forest Health
5. Forest Watershed Management
6. Engineering for Sustainable Forestry

*The Forest Policy Analysis and Management area of concentration is jointly sponsored by the Forest Engineering, Resources and Management Department, Applied Economics Graduate Program and the Agricultural Resource Economics Department.

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, accomplishments indicate high potential for success as a PhD candidate.

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, and certainly within 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 one 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 field of concentration.

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. Teaching methods.

Dissertation and Language Requirements

The Graduate School prescribes the form of the dissertation, as well as the timing and nature of the final oral examination. The PhD 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 and the department head, for approval. The program of study must be filed with the Graduate School prior to scheduling the preliminary written examination. Each area of concentration has background requirements that must be completed either with acceptable courses taken for prior degree or with additional courses while enrolled as a PhD candidate at OSU. A total of 108 graduate credit hours (500 level or greater) are required to complete the PhD degree. Courses taken to meet the minimum educational background may not be used to meet this requirement.

Required Courses

All graduate students majoring in any concentration in the Sustainable Forest Management graduate program are required to undertake a 12-credit core in forest management and research methods consisting of:

1. *Sustainable Forest Management (3 credits total)*: An overview of the role of forests in providing products and ecosystems services around the world and criteria and indicators of sustainable forest management, forest policy and regulations.
2. *Critical Thinking and Research Methods (3 credits total)*: Lectures and seminars in research philosophies and methods with special emphasis on applied research;

3. *Graduate Level Statistics or Econometrics (6 credits total):* Graduate level courses in either statistics or econometrics to be agreed upon by the student's committee and approved by the Program Director.

Two required courses (6-8 credits total) from the concentration the student has chosen.

1. A minimum of 36 credits of dissertation in Sustainable Forest Management in their chosen concentration.
2. A 1 credit graduate seminar during the first year of their program to present their dissertation proposal and 1 credit of graduate seminar at the end of their program to present their dissertation results.

Example Programs

The specific program will be developed by the student and student's committee and may include work in another field as needed to prepare the student for the PhD dissertation. Example programs for concentration follow. A program of study must include a minimum of 50% coursework, including thesis at the graduate student only level (G). Classes where seniors are also permitted are designated as (g). Courses taken during an MS program can substitute for core or supporting courses.

Forest Operations Planning and Management (PhD)

An example of a program for a PhD in Forest Operations Planning and Management might look like:

		Credits	Level
SFM Core:			
FOR 550	Sustainable Forest Management	3	G
FS 521	Natural Resource Research Planning	2	G
ST 511	Methods for Data Analysis I	4	g
ST 512	Methods for Data Analysis II	4	g
Required Concentration Courses:			
FE 547	Tactical and Operational Planning	3	g
FE 555	Forest Supply Chain Management	3	G
Example Pool of Supporting Courses (51-52 credits):			
FE 522	Forest Geomatics	4	G
FE 540	Forest Operations Analysis	3	g
FE 541	Production Planning	3	g
FE 552	Forest Transportation Systems	4	G
FE 560	Forest Operations Regulations and Policy Issues	3	g
FE 640	ST/Heuristics for Combinatorial Optimization	3	G
FOR 521	Spatial Analysis of Forested Landscapes	3	g
FOR 524	Forest Biometrics	3	G
FOR 561	Forest Policy Analysis	3	G
FS 543	Advanced Silviculture	3	G
FS 553	Forest Wildlife Habitat Management	4	G

Forest Operations Planning and Management (PhD) continued

		Credits	Level
IE 521	Industrial Systems Optimization I	3	G
IE 522	Industrial Systems Optimization II	3	G
IE 536	Lean Manufacturing Systems Engineering	4	g
IE 563	Advanced Production Planning and Control	3	G
ST 521	Introduction to Statistical Methods I	4	g
ST 522	Introduction to Statistical Methods II	4	g
ST 551	Statistical Methods I	4	G
ST 552	Statistical Methods II	4	G
BA 562	Managing Projects	3	G
BA 550	Organizational Management	3	G
WSE 555	Marketing and Innovation in Renewable Materials	3	g
Other:			
FE 603	Dissertation	36	G
FE 507	Seminar	2	G
Total		108+	

Forest Policy Analysis and Management (PhD)

An example of a program to address a policy question in wildland fire management:

		Credits	Level
SFM Core:			
FOR 550	Sustainable Forest Management	3	G
FS 521	Natural Resource Research Planning	2	G
Required Concentration Courses:			
FOR 561	Forest Policy Analysis	3	G
AEC 512	Microeconomic Theory I	4	G
Example Supporting Courses for a PhD Program (58):			
FOR 534	Economics of the Forest Resource	3	G
FOR 536	Wildland Fire Science and Management	4	g
FOR 546	Wildland Fire Ecology	3	g
AEC 523	Statistics and Optimization for Economics	4	G
AEC 525	Applied Econometrics	4	G
FE 640	ST/Heuristics for Combinatorial Optimization	3	G
PS 574	Natural Resource Policy and Bureaucratic Politics	4	G
FOR 562	Natural Resource Policy and Law	3	G
FOR 521	Spatial Analysis of Forested Landscapes	3	g
One of:			
ST 581	Linear Programming	3	g
IE 521	Industrial Systems Optimization I	3	G

Forest Policy Analysis and Management (PhD) continued

		Credits	Level
Two of:			
AEC 611	Advanced Microeconomic Theory I	4	G
AEC 515	Macroeconomic Theory	4	G
AEC 615	Advanced Macroeconomic Theory	4	G
AREC 651	Advanced Natural Resource Economics	3	G
AREC 562	Advanced Environmental Economics	3	G
Other:			
FOR 603	Dissertation	36	G
FOR 507	Seminar	2	G
Total		108+	

Forest Biometrics and Geomatics (PhD)

An example of a program for a PhD in **Forest Biometrics** might look like:

		Credits	Level
SFM Core:			
FOR 550	Sustainable Forest Management	3	G
FOR 521	Natural Resource Research Planning	2	G
ST 521	Introduction to Mathematical Statistics I	4	g
ST 522	Introduction to Mathematical Statistics II	4	g
Required Concentration Courses (6 credits, two courses):			
FOR 524	Forest Biometrics	3	G
FOR 525	Forest Modeling	3	G
Geomatics	Satisfied by a new/existing geospatial course	3	G
Example Pool of Supporting Courses (51-53 credits):			
ST 551	Statistical Methods I	4	G
ST 552	Statistical Methods II	4	G
ST 553	Statistical Methods III	4	G
ST 561	Theory of Statistics I	3	G
ST 562	Theory of Statistics II	3	G
ST 563	Theory of Statistics III	3	G
FS 543	Advanced Silviculture	3	G
GEO 541	Spatio-Temporal Variation in Ecology & Earth Sci	4	G
FOR 561	Forest Policy Analysis	3	G
ST 535	Sampling Methods	3	g
ST 555	Advanced Experimental Design	3	G
ST 557	Applied Multivariate Analysis	3	G
ST 565	Time Series and Spatial Statistics	3	G
ST 571	Environmental Sampling	3	G
ST 623	Generalized Regression Models I	3	G
ST 625	Generalized Regression Models II	3	G

Forest Biometrics and Geomatics (PhD) continued

		Credits	Level
Other:			
FOR 603	Dissertation	36	G
FOR 507	Seminars	2	G
	Total	108+	

An example of a PhD program in **Forest Geomatics** might look like:

		Credits	Level
SFM Core:			
FOR 550	Sustainable Forest Management	3	G
FS 521	Natural Resource Researching Planning	2	G
ST 511	Methods for Data Analysis I	4	g
ST 512	Methods for Data Analysis II	4	g
Required Concentration Courses (two courses):			
FE 522	Forest Geomatics	4	g
FOR 524	Forest Biometrics	3	G
CE 513	GIS in Water Resources	3	g
Example Pool of Supporting Courses (51-53 credits):			
FOR 521	Spatial Analysis of Forested Landscapes	3	g
FOR 525	Forest Modeling	3	G
FE 515	Forest Road Engineering	3	g
FE 532	Forest Hydrology	3	G
FE 541	Production Planning	3	g
FE 549	Strategic and Tactical Planning Techniques	3	g
FE 640	Combinatorial Optimization	3	G
GEO 541	Spatio-Temporal Variation in Ecology and Earth Science	4	g
ST 565	Time Series and Spatial Statistics	3	G
CE 562	Digital Terrain Modeling	4	G
GEO 580	Advanced GIS Applications in the Geosciences	4	G
GEO 544	Remote Sensing	4	g
CS 553	Scientific Visualization	4	g
GPH 640	Geodesy	4	G
GEO 546	Advanced Landscape Ecology	4	G
FOR 534	Economics of the Forest Resource	3	G
FOR 536	Wildland Fire Science and Management	4	g
Other:			
FE 603	Dissertation	36	G
FE 507	Seminars	2	G
	Total	108+	

Silviculture, Fire, and Forest Health (PhD)

An example of a program to address a forest restoration project might look like:

		Credits	Level
SFM Core:			
FOR 550	Sustainable Forest Management	3	G
FS 521	Natural Resource Research Planning	2	G
ST 551	Statistics I	3	g
ST 552	Statistics II	3	g
Required Concentration Course:			
FS 543	Advanced Silviculture	3	G
Supporting courses (select 56+ credits):			
BI 570	Community Structure and Analysis	4	G
BOT 543	Plant Community Ecology	3	G
BOT 550	Plant Pathology	5	g
CSS 540	Weed Management	4	g
FE 532	Forest Hydrology	4	G
FE 534	Forest Watershed Management	4	g
FE 535	Water Quality and Forest Land Use	3	G
FOR 520	Advanced Aerial Photos and Remote Sensing	3	g
FOR 521	Spatial Analysis of Forested Landscapes	3	G
FOR 536	Wildland Fire Science and Management	4	g
FOR 545	Ecological Restoration	4	g
FOR 546	Wildland Fire Ecology	3	g
FOR 554	Managing at the Wildland-Urban Interface	3	g
FOR 561	Forest Policy Analysis	3	g
FOR 562	Natural Resource Policy and Law	3	G
FS 515	Forest Insect and Disease Management	5	g
FS 523	Natural Resource Data Analysis	4	G
FS 545	Advanced Forest Community Ecology	4	G
FS 548	Biology of Invasive Plants	3	G
FS 561	Physiology of Woody Plants	3	G
FS 600	Global Change Ecology	3	G
FS 646	Forest Ecosystem Analysis and Application	4	G
GEO 541	Spatio-Temporal Variation in Ecology and Earth Sci	4	G
GEO 546	Advanced Landscape Ecology	3	G
ST 531	Sampling Methods	3	g
ST 535	Quantitative Ecology	3	g
ST 571	Environmental Sampling	3	G
Other:			
FOR 603	Dissertation	36	G
FOR 507	Seminars	2	G
Total		108+	

Forest Watershed Management (PhD)

A program of study in Forest Watershed Management might look like:

		Credits	Level
SFM Core:			
FOR 550	Sustainable Forest Management	3	G
FS 521	Natural Resource Research Planning	2	G
ST 511	Methods for Data Analysis I	4	g
ST 512	Methods for Data Analysis II	4	g
Required Concentration Courses:			
FE 537	Hillslope and Watershed Hydrology	4	G
FE 530	Watershed Processes	4	g
Example Pool of Supporting Courses (49-51 credits)			
FE 538	Field Hydrology	3	G
FE 534	Forest Watershed Management	4	g
FE 535	Water Quality and Forest Land Use	3	G
FE 532	Forest Hydrology	4	G
FOR 545	Ecological Restoration	4	G
FS 545	Advanced Forest Community Ecology	4	G
FS 547	Nutrient Cycling	3	G
FS 564	Interaction of Vegetation and the Atmosphere	3	G
FS 646	Forest Ecosystem Analysis and Application	4	G
BEE 512	Physical Hydrology	3	G
BEE 525	Stochastic Hydrology	3	G
BEE 545	Sediment Transport	4	G
CE 513	GIS in Water Resources	3	g
CE 518	Ground Water Modeling	4	G
CE 543	Applied Hydrology	4	G
CE 547	Principles of Fluid Mechanics	4	G
CE 548	Water Quality Dynamics	3	G
CSS 535	Soil Physics	3	G
CSS 536	Vadose Zone Hydrology Lab	1	G
GEO 548	Field Research in Geomorphology	3	G
GEO 582	Geomorphology of Forest and Streams	3	G
GEO 487	Hydrogeology	4	G
ST 513	Methods of Data Analysis III	4	g
ST 515	Design and Analysis of Experiments	3	g
FW 556	Limnology	5	G
FW 580	Stream Ecology	3	G
Other:			
FE 603	Dissertation	36	G
FE 507	Seminar	2	G
Total		108+	

Engineering for Sustainable Forestry (PhD)

An example of a program for a PhD in Engineering for Sustainable Forestry might look like:

		Credits	Level
SFM Core:			
FOR 550	Sustainable Forest Management	3	G
FS 521	Natural Resource Research Planning	2	G
ST 511	Methods for Data Analysis I	4	g
ST 512	Methods for Data Analysis II	4	g
Required Concentration Courses:			
FE 552	Forest Transportation Systems	4	G
FE 532	Forest Hydrology	3	G
Example Pool of Supporting Courses (50 credits):			
FE 515	Forest Road Engineering	3	g
FE 516	Forest Road System Management	4	g
FE 535	Water Quality and Forest Land Use	3	G
FE 536	Forest Erosion Processes	3	G
FE 540	Forest Operations Analysis	3	g
FE 541	Production Planning	3	g
FE 550	Forest Operations Design I	3	g
FE 551	Forest Operations Design II	3	g
FE 570	Logging Mechanics	4	g
FE 571	Harvesting Management	3	g
FE 522	Forest Geomatics	4	g
GEO 580	Advanced GIS Applications in the Geosciences	4	G
FOR 534	Economics of the Forest Resource	3	G
FS 543	Advanced Silviculture	3	G
FE 572	Advanced Logging Mechanics I	4	G
FE 555	Forest Supply Chain Management	3	G
IE 521	Industrial Systems Optimization I	3	G
IE 522	Industrial Systems Optimization II	3	G
IE 545	Human Factors Engineering	4	G
FE 640	ST/Heuristics for Combinatorial Optimization	3	G
Other:			
FOR 603	Dissertation	36	G
FE 507	Seminar	2	G
Total		108+	

PhD Qualifying Examination for Advancement to Candidacy

Written Preliminary Examination

Successful completion of a written preliminary examination is a prerequisite to the oral comprehensive examination. The written examination will consist of questions in each field of specialization and such additional questions as the student's committee deem appropriate. The examination must provide a comprehensive assessment of the student's competence in both the theory and research methods appropriate to the dissertation area and fields of specialization elected within that area.

The written exam contains questions submitted and evaluated by the candidate's committee. The major professor coordinates the testing. It is scheduled by the student's committee near the completion of courses and is intended to test the student's preparation to do graduate research and to determine the extent of the student's knowledge in the major and minor subject areas. The topics should be integrative in nature, requiring the student to demonstrate the ability to apply principles to current problems. Additional questions can be solicited from other faculty to completely cover the topics in the candidate's program.

Oral Comprehensive Examination

The oral comprehensive examination may cover the same area as the written examination, the prospective dissertation research, and other topics relevant to the student's preparation. The oral examination will be schedule as soon as possible after the successful completion of the written examination. In all deliberations and decisions regarding the oral examination, the current rules of the Graduate School will apply. Upon successful completion of the oral examination, the student is advanced to candidacy for the doctorate.

PhD Final Oral Examination

In all deliberations and decisions regarding the final examination, the current rules of the Graduate School will apply. Upon successful completion of the final oral examination, the candidate is certified for award of the PhD degree.



**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 AICUC 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/irb.htm>. More information can be obtained by contacting Steve Durkee at 7-2762 in the Research Integrity Office IACUC@oregonstate.edu.