INFORMATION OF NATURAL RESOURCES GRADUATE PROGRAM

FORESTRY EMPHASIS AREA

School of Natural Resources, 203 Natural Resources Building (573) 882-7242

http://www.snr.missouri.edu/forestry/academics/graduate-program.php

Spring 2014

General Resources: University of Missouri Graduate School Webpage: http://gradschool.missouri.edu/

The MU graduate school website contains numerous links to forms, requirements and the graduate catalogue. All critical information and guidelines for graduate education at the University of Missouri are listed or linked from the Graduate School website.

When in doubt about a requirement, please refer to the graduate catalog. It is each *student's responsibility to know the regulations* described in the Catalog. The graduate catalogue for the academic year that the student enters the program represents the applicable policies, requirements and guidelines for that student during that student's tenure in the graduate program at the University of Missouri.

Policies and Forms: The forms described below can be located, downloaded, and printed from the grad school webpage under the forms and downloads link: http://gradschool.missouri.edu/policies/

Master's Students: Background and Policies **http://gradschool.missouri.edu/policies/masters/**

The School of Natural Resources offers a Master's of Science in Natural Resources degree with a Forestry emphasis area.

To attain the Master's degree, 30 credit hours of course work must be completed, and 15 credit hours or more shall be 8000 level or above. Not more than 40 percent of the 30-credit hour requirement can be satisfied by a combination of Special Investigations, Research, Readings, and / or Problems courses. A maximum of 20 percent of the number of credit hours required for a student's degree may be graduate credits transferred from another university, including another campus of the University of Missouri system upon the recommendation of the advisor, the approval of the academic program director of graduate studies and the Graduate School.

Required coursework and research activity are determined by the student's graduate committee. The graduate committee must consist of at least 3 members with one faculty member outside the Forestry Emphasis Area. The cumulative GPA for all course work submitted for the degree must be 3.0 or better.

A thesis, or a minimum of five semester hours of non-thesis research acceptable to the student's committee, shall be completed before the final examination. Research toward a thesis normally shall not exceed eight credit hours. Thesis and defense requirements are as defined by the MU Graduate School. A final oral examination is given to all candidates before completion of the degree.

FORMS AND TIMELINES FOR MASTER'S STUDENTS

http://gradschool.missouri.edu/policies/masters/requirements/

M1 Plan of study for Master's Degree

http://gradschool.missouri.edu/policies/masters/requirements/m1.pdf

Together with the advisor, the student completes this form and provides it to the Director of Graduate Studies in the department. This form provides the student, the department and the Graduate School with a plan for all course work, transfer credit and research hours that will comprise a student's program of study. This form should be completed by the end of the second semester.

M2 Request for Thesis Committee

http://gradschool.missouri.edu/policies/masters/requirements/m2.pdf

This form accompanies the M1, and should be submitted at the same time, by the end of the second semester. It is required of students who will be writing a thesis. The thesis committee for MS students in forestry consists of at least 3 faculty members, 2 from the Department of Forestry and one from an outside discipline within the University. If one member is an affiliated faculty member with the Department of Forestry, the other departmental member must be a tenure track or professional track faculty member in the Department of Forestry.

M3 Report of Master's Examining Committee

http://gradschool.missouri.edu/policies/masters/requirements/m3.pdf

This form reports the final results of 1) master's thesis defense 2) master's project presentation or 3) master's comprehensive examination. Submit to the Graduate School as soon as possible after the exam, project presentation or thesis defense.

Thesis defense seminar: All students must present a defense seminar in advance of his or her examination. The seminar must be publicized and the Director of Graduate Studies needs to be informed of the date as soon as the student arranges it, but at least two weeks before it is presented. If the seminar is not appropriately announced, it may be considered invalid.

PH.D. STUDENTS BACKGROUND AND POLICIES

https://gradschool.missouri.edu/policies/doctoral/

The School of Natural Resources and the Office of Graduate School of the University of Missouri confer the Ph.D. degree only upon those students who have completed necessary coursework and a substantial independent research project resulting in a dissertation. Dissertation research may be directed toward the solution of problems faced by practicing foresters or may consist of fundamental investigations pertinent to the solution of such problems.

The Ph.D. degree in forestry is designed to prepare students for academic careers in research and teaching or other advanced scientific or professional careers. The student pursuing the doctoral program is expected to pass qualifying, comprehensive and final examinations administered by the student's doctoral committee. This committee is structured (at a minimum) as defined by the MU Graduate School and must have representatives from a discipline outside the forestry emphasis area. Although the Graduate School requires 4 members on a Ph.D. committee, the Ph.D. committees in the Forestry emphasis area must consist of 5 members. The forestry emphasis area also strongly recommends that 2 outside disciplines be represented on the committee. An independent scholarly dissertation approved by the student's adviser and program committee must be completed in a form acceptable to the doctoral committee.

The Ph.D. degree is conferred only upon those students who, after extensive study, have demonstrated a high level of achievement in their particular specialization in forestry and have completed independent research contributing to knowledge in the field.

Credit requirement:

1. MU requires a minimum of 72 credit hours beyond the baccalaureate degree for the Ph.D.
2. The committee may recommend that a certain number of credits from the Master's degree be granted toward Ph.D. course requirements.
3. A maximum of 30 credit hours of transferred post-baccalaureate graduate credit from an accredited university can be granted toward the Ph.D. degree program.
4. The program must include a minimum of 15 credit hours of 8000-level or above course work,

exclusive of Special Investigation, Research Reading, and/or Problemscourses.

QUALIFYING EXAMINATION. The qualifying examination determines whether the student's background is adequate to enter the Ph.D. program, as a candidate. It also is intended to ascertain if there are areas of weakness in which a candidate will be required to gain background through appropriate course work. Therefore, it is advisable that the student, in conjunction with advisor, selects a committee and completes the qualifying exam within the first 2-3 semesters.

COMPREHENSIVE EXAMINATION. The comprehensive examination is taken following the completion of most, if not all, the course work requirements established by the graduate committee. The objectives of the comprehensive examination are twofold:

1) to determine if a student has acquired sufficient depth and breadth of knowledge in selected areas of concentration

2) to evaluate the candidate's capacity to apply that knowledge in solving applied or theoretical problems.

FINAL EXAM (DISSERTATION DEFENSE EXAM). The final examination is directed toward, but not limited to, exploration of the dissertation research project.

DISSERTATION DEFENSE SEMINAR: The DGS must be informed of the dissertation defense seminar at least two weeks in advance of the seminar. It must be well advertised and open to the public.

Doctoral Forms (note that forms may change, so always check the graduate school website. See the website: "Doctoral Time Line: Forms and Requirements")
https://gradschool.missouri.edu/policies/doctoral/requirements/

D-1 Qualifying Exam/Committee (PDF)
https://gradschool.missouri.edu/policies/doctoral/requirements/d1.pdf

Submission of this form follows a meeting of the student's graduate committee and approval by the committee, of the student's proposal, plan of research and coursework. This form is to be submitted to the Graduate School no later than the end of the student's second semester of enrollment.

D-2 Plan of Study (PDF)
https://gradschool.missouri.edu/policies/doctoral/requirements/d2.pdf

This form accompanies the D-1, and is also to be submitted to the Graduate School no later than the end of the student's second semester of study. Doctoral students must take a minimum of 15 credit hours of regular 8000/9000 level coursework. This regular coursework cannot include Problems, Independent Readings, Research or other independent study courses.

D-3 Doctoral Comprehensive Exam Form (PDF)and Continuous Enrollment
https://gradschool.missouri.edu/policies/doctoral/requirements/d3.pdf

This form should be completed and filed with the Graduate School within one month of exam completion.

Continuous enrollment is required for all semesters during which a student is a candidate https://gradschool.missouri.edu/policies/doctoral/requirements/candidacy-enrollment.php.

D-4 Report of the Dissertation Defense (PDF)
https://gradschool.missouri.edu/policies/doctoral/requirements/d4.pdf

This form should be completed and filed with the Graduate School as soon as possible after the defense.

Prior to degree completion, Ph.D. students are required to complete additional forms. See the

Graduate School webpage for most recent requirements.

Each student (MS and Ph.D.) is to complete the application for graduation early in the last semester of enrollment. **The student is to inform the Departmental Director of Graduate Studies of his / her intention to graduate**. Students apply for graduation directly to the Graduate School.
Deadlines are early in the semester.
https://gradschool.missouri.edu/policies/commencement/self-graduation.php

THESIS AND DISSERTATION GUIDELINES Every candidate should review the "Guidelines for Preparing Theses and Dissertations" from the Graduate School and should consult the Director of Graduate Studies for academic program style requirements. https://gradschool.missouri.edu/policies/thesis-dissertation/

ENROLLMENT REQUIREMENTS

Enrollment requirements vary by advisor and financial support requirements. The graduate advisor may stipulate the number of credits required each semester. Graduate School requirements, however, are more flexible. A student could be enrolled in 1 credit hour and still get a tuition waiver as long as they hold a qualifying assistantship.

To maintain their visas, international students must be enrolled in 9 credit hours each fall and spring semester, or 6 credit hours if they have an assistantship. If an international student is enrolled for less than 6 credits, the student needs to check with the International Center.

For all students, their FICA exempt status is revoked if they are enrolled less than half-time, e.g., 4 credit hours each fall and spring semesters and 2 credit hours in the summer.

Enrollment requirements may vary, also, depending on loan deferment specifications.

GRADUATE STUDENT PROGRESS SYSTEM

Once a year, typically near the end of the academic year, every graduate student **must** submit an annual report online through the Graduate Student Progress System (GSPS). Go to the graduate school website (http://gradschool.missouri.edu/) and click on "Login to Grad Progress System" under "Policies and Forms". Students complete the sections "Required by the Graduate School" but it is recommended by the Department that the student also complete the "May Be Required by Your Academic Program" Sections as well. As part of this, you will fill out a "Progress Report" that your advisor reviews and responds to.

The annual report is useful for the students since it provides a way to keep track of student accomplishments and awards in one location. This organization greatly facilitates the creation of a CV. Students will receive an email reminder, usually by the end of March.

GRADUATE TENTURE TRACK FACULTY

Francisco Aguilar, Associate Professor
Ph.D. -Louisiana State University
Forest **economics**, **natura**l **resource**s **polic**y, AguilarF@missouri.edu

Hong S. He, Professor
Ph.D. -Chinese Academy of Sciences, China
Landscape **ecolog**y, GIS, and landscape modeling, Heh@missouri.edu

Jason Hubbart, Associate Professor
Ph.D. -University of Idaho
Forest **hydrology**, **wate**r **qualit**y, HubbartJ@missouri.edu

Shibu Jose, Professor
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Agroforestry, Joses@missouri.edu

David R. Larsen, Professor
Ph.D. -University of Washington
Stand dynamics, **biometrics**, **silvicultur**e, Larsendr@missouri.edu

Rose-Marie Muzika, Professor
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Forest **ecology**, **entomolog**y, muzika@missouri.edu

Benjamin O. Knapp, Assistant Professor
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Silviculture, KnappB@missouri.edu

Henry (Hank) E. Stelzer, Associate Professor
Ph.D. -Purdue University
Extension, **fores**t **management**, **fores**t **genetic**s, StelzerH@missouri.edu

GRADUATE RESEARCH FACULTY

Mark V. Coggeshall, Assistant Research Professor
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Michael A. Gold, Research Professor
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Agroforestry , GoldM@missouri.edu

Richard P. Guyette, Research Professor
Ph.D. -University of Missouri-Columbia
Dendrochronology , GuyetteR@missouri.edu

Chung-Ho Lin, Research Assistant Professor
Ph.D. -University of Missouri
Soil chemistry, herbicide sensitivity, LinChu@missouri.edu

Michael C. Stambaugh, Research Assistant Professor
Ph.D.-University of Missouri
Fire ecology, Dendrochronology, stambaughm@missouri.edu

Forest Service Cooperative Graduate Faculty:

Daniel Dey, Ph.D. University of Missouri
Fire ecology, oak silviculture, riparian silviculture, ddey@fs.fed.us

John Kabrick, Ph.D. University of Wisconsin-Madison
Forest soil, forest ecology, silviculture, jkabrick@fs.fed.us

Steve R. Shifley, Ph.D. University of Minnesota
Forest biometrics, inventory, and landscape modeling, shifleys@missouri.edu

Jerry Van Sambeek, Ph.D. Washington University
Plant physiology, jvansambeek@fs.fed.us

COURSEWORK:

The graduate courses available through the Department of Forestry can be found in the graduate catalogue http://gradschool.missouri.edu/programs/catalog/index , or in the MU Registrar's MyZou system page:

https://myzou.missouri.edu/psp/prd/?cmd=login.

Graduate students typically enroll in courses from across campus. For graduate students of Forestry emphasis area and lack academic or experiential background in forestry, the graduate committee may recommend several courses to compensate for that deficiency. Forestry graduate students commonly enroll in dual undergraduate /graduate courses at the 7000 level, such as Silviculture, Forest Stand Dynamics, Forest Ecology, Forest Watershed Management and Water Quality.

For a graduate students emphasizing forestry, Forestry Seminar (FOREST 9087) is the only required course in the graduate student's program of study. As of January 2008, all Ph.D. students must enroll in Forestry Seminar (FOREST 9410) at least twice during the student's graduate program. All graduate students are expected to attend all forestry seminars regardless of whether the student is enrolled in the seminar course

GRADUATE COURSES IN THE DEPARTMENT OF FORESTRY

FOREST 7301 Topics in Forestry (cr.arr.). Organized study of selected topics. Intended for upper-division and graduate students. Subjects and credit may vary from semester to semester. Prerequisite: graduate standing.

FOREST 7320 Forest Ecology (5). Principles of community, ecosystem, and population ecology and examination of the influence of environmental factors and human activity on forest dynamics, composition, structure and function. Prerequisites: graduate standing FOREST 2151 or BIO SC 3210 or instructor's consent.

FOREST 7330 Practice of Silviculture (3). Applied ecological principles, cultural practices, tree improvement techniques and treatments to forest stands and other lands for systematic production of goods and services. Prerequisite: graduate standing and FOREST 4320.

FOREST 7340 Tree Physiology (3). Lectures on physical and chemical phenomena involved in the functions and activities of trees. Prerequisites: graduate standing BIOCHM 2110; BIO SC 1200; CHEM 1100; or instructor's consent.

FOREST 7350 Forest Economics (3). Economic principles applied to production/marketing of goods and services from forest land: emphasizes capital and land factors and investment alternatives related to time. Prerequisites: graduate standing and Mathematics requirement completed; AG EC 1041, or 3080.

FOREST 7360 Photogrammetry, Inventory and Models 3). Applied course in the area of aerial photogrammetry, forest inventory, and simple GIS applications for developing, maintaining, and utilizing these tools in a forest management. Prerequisite: graduate standing and NAT R 1080 or instructor's consent.

FOREST 7365 Logging Systems: Operations and Analyses (3). A systems approach to timber harvesting from acquisition through engineering to log transport. Regional aspects and influences will be considered. Prerequisites: graduate standing and FOREST 2543 and 2544.

FOREST 7370 Wildland Fire Management (3). Management, administration, and organization of wildland and prescribed fires and other natural and manmade disasters. Emphasis placed on organizational arrangements of incidents rather than on either strategy or tactics. Prerequisites: graduate standing and FOREST 3207 or equivalent.

FOREST 7375 Forest Stand Dynamics (3). Examines the development of forest structure, the role of disturbance on forest change and the use of this knowledge in applying silvicultural systems. Both forest stand dynamics theories, structure diagrams, forest growth models, and long term data sets are used to understand stand dynamics. Prerequisite: graduate standing and FOREST 4330 or instructor's consent.

FOREST 7380 Forest Resource Management (3). Teaches resource managers how to develop a plan for the management of forest resources using managerial, economic, silvical and wildlife techniques for its

enhancement and to meet the landowner's objectives. Prerequisites: graduate standing and FOREST 4330 and 4350.

FOREST 7385 Agroforestry I: Theory, Practice and Adoption (4). Understand biophysical, ecological social and economic features of temperate and tropical agroforestry. Covers the basics of design, planning and implementation of agroforestry practices. Prerequisite: graduate standing.

FOREST 7390 Watershed Management and Water Quality (3). Hydrologic processes on wildland watersheds. Effects of forest land management on streamflow, erosion and water quality. Prerequisites: graduate standing and FOREST 2541 or instructor's consent.

FOREST 8050 Research in Forestry (cr.arr.). Original research not leading to preparation of dissertation.

FOREST 8090 Masters Thesis Research in Forestry (1-10). Original investigation for presentation in a M.S. thesis. Graded on a S/U basis only.

FOREST 8390 Physical Hydrology (3). Students will obtain an understanding of hydrologic processes in terms of the occurrence, distribution and movement of water spanning the atmosphere and lithosphere. Students will have an opportunity to develop an understanding of physical processes governing mass and energy flux in wildland and anthropogenic systems. Prerequisites: College Physics and Calculus I. Graded on A/F basis only.

FOREST 8401 Topics in Forestry (cr.arr.). Organized study of selected topics. Subjects and credit may vary from semester to semester. Prerequisite: instructor's consent.

FOREST 8430 Applied Silviculture (3). Ecological and economic factors affecting application of silviculture in each of eighteen forest regions in United States. Prerequisite: FOREST 4330.

FOREST 8450 Forest Soils (3). Physical, chemical and biological properties of forest soils in relation to tree growth. Prerequisites: FOREST 4330 or instructor's consent.

FOREST 8460 Advanced Forest Ecology (3). Lecture/discussion based course emphasizing contemporary and classic ecological studies and concepts in the context of current forest ecology issues and research. Prerequisite: undergraduate ecology course

FOREST 8490 Advanced Forest Management (3). Modern quantitative methods to facilitate decision-making in harvest scheduling and regulation, land use allocation, and production planning in natural resource management. Prerequisite: FOREST 4380.

FOREST 8515 Ecological Modeling (3). An introduction to the topics and philosophy of ecological modeling. The course will guide you through the process of developing a conceptual model, formalizing the model, formulating, parameterizing, and running the model as well as analyzing the results. Prerequisites: graduate standing or instructor's consent.

FOREST 8520 Social Forestry (3). Issues with using forestry as an international development tool; planning, implementing and evaluating farm and community forestry projects. Prerequisite: FOREST 4350, or AG EC 3270, or equivalent and instructor's consent.

FOREST 8530 Ecosystem Management: The Human Dimension (3). Overview of cultural, social, political and economic dimensions of natural resource problems and issues from an ecologically grounded management perspective. Prerequisite: NAT R 4353 or equivalent.

FOREST 8540 Tree Growth-Quality Relationships (3). Response of tree growth (wood formation) to such environmental influences fertilization, moisture, nutrient supply, wounding pruning, etc.

FOREST 8620 Plant-Water Relations (3). Absorption, translocation, utilization and loss of water by plants . Biophysics of water movement in the soil-plant-atmosphere continuum. Effects of water deficits on physiological processes.

FOREST 8625 Plant-Water Relations Laboratory (2). Introduction to techniques and instrumentation used in studies of plant-water relations. Corequisite: FOREST 8620.

FOREST 9090 Dissertation Research in Forestry (1-10). Original investigation for presentation in a doctoral dissertation. Graded on a S/U basis only.

FOREST 9410 Seminar in Forestry (1). Discussions of current developments in Forestry, and critical study of

research programs. Graduate standing required. Graded on a S/U basis only .

GRADUATE COURSES IN THE NATURAL RESOURCES TAUGHT BY FACULTY IN FORESTRY DEPARTMENT

NAT R 7325 Introduction to Geographic Information Systems (3). The course covers basic theories and techniques of GIS; emphasizes on the nature and processing of spatial information including: data representation, input, manipulation, storage, and spatial analyses.

NAT R 7365 GIS Applications (3). The course introduces logical thinking and techniques in applying GIS to practical problems, covers general GIS functionalities, including database management, spatial and non-spatial query, terrain analysis, hydrological analysis, grid, and remote sensing image processing. Prerequisite: NATR4325/7325, GEOG4840, or consent of the instructor.

NAT R 8395 Landscape Ecology and GIS Analysis II (3). The course covers principles and applications of landscape ecology, metrics for spatial pattern analysis, models for landscape dynamic simulation, and spatial analysis techniques using GIS. Prerequisite: NATR4325/7325, GEOG4840, or consent of the instructor.