

# **GRADUATE STUDENT HANDBOOK**

Policies and Procedures for Graduate Studies

School of Forestry  
College of Ecosystem Science and Management  
Northern Arizona University

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## **INTRODUCTION**

The Graduate Student Handbook summarizes the requirements and responsibilities of faculty and graduate students in the School of Forestry at Northern Arizona University. It provides students and faculty with information needed to successfully complete or direct graduate programs. Detailed information regarding general Graduate Admissions and Academic Services requirements is available in the Graduate catalog. Some of the information presented in those documents is duplicated here for clarity. The Graduate Admissions and Academic Services has final authority on all policy matters and changes in Graduate Admissions and Academic Services policy usually automatically change School of Forestry policies and procedures. It is the student's responsibility to become aware of and adhere to all policies and requirements established by the Graduate Admissions and Academic Services and the School of Forestry. The final responsibility for meeting all School, Graduate Admissions and Academic Services, and University requirements and deadlines rests with the student.

This handbook applies to all Doctor of Philosophy students and all Master of Science students in the School of Forestry admitted for the Fall 2000 semester or later. Students admitted prior to this semester have the option of continuing under the previous requirements or under these requirements.

## **ADMISSION TO GRADUATE PROGRAMS**

### **GENERAL ADMISSION REQUIREMENTS**

A minimum grade point average of 3.0 (on a 4 point scale) in all college and university work is required for admission.

No student will be admitted to either the Masters or the Ph.D. programs without a faculty member in the School of Forestry agreeing to act as that student's Major Professor. The Major Professor must be a regular member of the School's faculty. Applicants are encouraged to contact a professor in their field of interest in the School prior to application to establish a basis for acceptance.

All applicants must take the Graduate Record Examination (GRE) and arrange for submission of their scores to the School. A minimum score of 500, 600, and 600 on the verbal, quantitative, and analytical portions, respectively, of the examination is required for admittance. These numerical scores equate to scoring in the top 40<sup>th</sup> percentile of those taking the exam (recorded as 60 % below on GRE report of scores). Provisional admittance may be granted in special cases without GRE scores. The prospective Major Professor of an applicant may petition for admittance of a student with a lower score. Such a petition must clearly explain why an exception should be granted.

The Faculty of the School recognizes the difficulties that foreign students may face in taking the GRE. Foreign students may apply without GRE scores and be admitted in provisional standing if all other admission requirements are met. However, the GRE must be taken as soon as possible upon enrollment. Students who do not take the examination by the end of the second semester or who do not receive a minimum score of 500, 600, and 600 on the verbal, quantitative, and analytical portions, respectively, will have their provisional standing status canceled and will be dropped from the Graduate program. The student's Major Professor in such circumstances may, however, petition for admittance of the student with a lower score. The petition must clearly explain why an exception should be granted.

All foreign students applying to the Masters or Ph.D. programs must take the Test of English as a Foreign Language (TOEFL) and arrange for submission of their scores to the School as part of the supporting documentation for their application. A minimum score of 550 on the TOEFL is required for admission.

### **ADMISSION REQUIREMENTS FOR THE MASTER OF SCIENCE PROGRAM**

#### **REQUIREMENTS FOR STUDENTS WITH A BACHELOR OF SCIENCE DEGREE IN FORESTRY**

Successful applicants for the Master of Science Program meeting all the general admission requirements detailed above, and having a Bachelor of Science degree in forestry or natural resources from a Society of American Foresters accredited program, will be admitted with regular standing to the Master of Science in Forestry program.

## REQUIREMENTS FOR STUDENTS WITHOUT A BACHELOR OF SCIENCE DEGREE IN FORESTRY

Successful applicants for the Master of Science Program meeting all the general admission requirements detailed above, but not having a Bachelor of Science degree in forestry or natural resources from a Society of American Foresters accredited program, will be granted admission with provisional standing. Admission to regular standing is provisional on the completion of 15 semester hours of remedial coursework in forestry with an average grade of "B". The intent of these requirements is to assure that a student who graduates with a Master of Science in Forestry has a breadth of knowledge in forestry. Note that the student's Thesis or Program (for non-thesis students) committee may specify additional remedial requirements.

## **ADMISSION REQUIREMENTS FOR THE PH.D. PROGRAM**

Entrance to the Ph.D. program is contingent on a student having demonstrated competence in scientific research. A Master of Science (thesis option) serves as the standard for such demonstrated competence. Other advanced degrees with demonstrated scientific research outputs equivalent to a masters thesis may qualify a student for admission. Such equivalents may include a masters of arts with a thesis requirement, or a non-thesis masters degree with research outputs such as sole or primary author of peer reviewed publications. Students seeking admission to the Ph.D. program should include in their applications an explicit statement of how their education and experience satisfies the intent of this requirement.

Applicants may be granted admission with provisional standing to the Ph.D. program if they have not yet completed their Masters degree and if they meet all other requirements for admission. Students have a maximum of 1 calendar year from the time of enrollment to complete their Masters degree and submit the appropriate proof of completion to the School. Students failing to complete this requirement will be dropped from the Ph.D. program at the end of the 1 year period.

## REQUIREMENTS FOR STUDENTS WITH AT LEAST ONE DEGREE IN FORESTRY

Successful applicants with at least one degree in Forestry Resources from a Society of American Foresters accredited program, and who meet all other admission requirements, will be admitted with regular standing to the Ph.D. program.

## REQUIREMENTS FOR STUDENTS WITHOUT AT LEAST ONE DEGREE IN FORESTRY

Successful applicants without at least one degree in Forestry Resources from a Society of American Foresters accredited program, and who meet all other admittance requirements, will be admitted with provisional standing to the Ph.D. program. These students must complete, at a minimum, 15 semester hours of remedial coursework in forestry with an average grade of "B". The student's Dissertation Committee may specify additional remedial requirements. These requirements must be successfully completed before the student can advance to Candidacy.

## **APPLICATION PROCEDURES**

All applicants must submit an Application for Admission to the School of Forestry and a separate application to the Graduate Admissions and Academic Services. Applicants must submit a detailed Statement of Intent (250 to 500 words in length) with their application that clearly defines the applicant's educational and professional background, interests, and career objectives.

Applicants must submit an official transcript of all college and university work to the Graduate Admissions and Academic Services. Applicants must also submit a transcript of all college and university work to the School of Forestry. A photocopy of an official transcript will be accepted by the School.

Applicants must have 3 letters of recommendation to support their application. Letters should be submitted on the forms available from the School (see appendix). Applicants are encouraged to arrange for recommendations from individuals with whom they have recent familiarity.

For fall semester admissions, completed applications with all supporting documentation must be received by March 15. For spring semester admissions, completed applications with all supporting documentation must be received by October 15 of the previous year. Applications received after these dates, including those only partially complete, will receive consideration only after full consideration of completed applications received by the deadline.

Information for the School of Forestry is available from the following source:

Coordinator of Graduate Studies  
School of Forestry  
P.O. Box 15018  
Northern Arizona University  
Flagstaff, AZ 86011-5018  
Telephone: 928-523-7491  
Web: <http://www.for.nau.edu>

Application materials are available from the Graduate Admission / Graduate College; see the following source:

Graduate Admissions / Graduate College  
P.O. Box 4125  
Northern Arizona University  
Flagstaff, AZ 86011-4125  
Telephone: 928-523-4349  
Web: <http://www.nau.edu/gradcol>

## **GRADUATE STUDIES COMMITTEE**

The establishment and review of Forestry graduate policies and procedures is the responsibility of the Graduate Studies Committee. This Committee will recommend to the faculty changes in this document when Graduate Admissions and Academic Services policies change and when policies herein no longer serve the interest of the Forestry Graduate Program. The faculty must approve all policies and procedures. The Coordinator of Graduate Studies also serves as the Chair of the Graduate Studies Committee. The Coordinator of Graduate Studies/Chair Graduate Studies Committee is appointed by the Forestry School Chair.

### **RESPONSIBILITIES OF COORDINATOR OF GRADUATE STUDIES**

1. Correspond with prospective School of Forestry graduate students.
2. Prepare reports and documents on graduate programs.
3. Represent the School of Forestry as necessary in relations with the Graduate Admissions and Academic Services.
4. Inform faculty in the School of Forestry of changing procedures and programs in graduate education at NAU.
5. Chair the Graduate Studies Committee.
6. Others as appropriate.

### **RESPONSIBILITIES OF GRADUATE STUDIES COMMITTEE**

1. Screen graduate student applications to the School of Forestry and make admission decisions. Determine if remedial coursework is required and the number of credits (Thesis/Dissertation Committee determines which courses are required.)
2. Propose policy for graduate student responsibilities in assisting in instruction, research, and School of Forestry administration. Policy will be established by the faculty and approved by the Chair of the School of Forestry.
3. Propose policy for financial support of graduate students in the School of Forestry:
  - By categories, i.e., M.S./Ph.D. research assistantships.
  - Selection criteria within categories. All such policy will be established by the faculty.
  - Oversee the above policies to ensure compliance by School of Forestry faculty and students.
4. Review the progress of graduate students in the School of Forestry and advise the Major Professor if student performance is inadequate.
5. Promote, through various media and student recruitment, those programs established above.
6. Monitor policies and programs and recommend changes as necessary to faculty of the School of Forestry and the School Chair for approval.



## **GRADUATE STUDIES COMMITTEE MEMBERSHIP**

The Graduate Studies Committee shall consist of the Chair (Coordinator of Graduate Studies) and four additional members (3 faculty and 1 graduate student) all from the School of Forestry. The term of appointment to the Graduate Studies Committee shall be three years with a mandatory one year between terms for any member, except for the Coordinator of Graduate Studies. The Coordinator of Graduate Studies and one of the faculty members will be appointed by the Chair of the School of Forestry. The Forestry Chair may appoint a member for a term of less than three years to create staggered terms of office. Two faculty members will be elected by general ballot of all School of Forestry faculty. The graduate student shall be elected by their peer graduate students in forestry. The graduate student representative shall have full rights to vote on all committee matters except admission or financial aid decisions. The student may, however, participate in policy discussions and decisions in these matters.

## **FULFILLMENT OF REMEDIAL REQUIREMENTS**

Graduate students, who have been admitted provisional on completing fifteen (15) credit hours of remedial coursework, shall work with their committee (Program, Thesis, or Dissertation) to design a remedial coursework program that develops basic competency in the field of forestry. The intent of these requirements is to assure that a student who graduates with a Master of Science or Doctor of Philosophy in Forestry has a breadth of knowledge in forestry.

### **REMEDIAL COURSEWORK DISTRIBUTION**

The remedial coursework will be distributed in the following three areas (adapted from the Society of American Foresters Accreditation Standards, Revised 1994):

#### **A. Forest Ecology and Biology**

##### **Minimum of 6 semester credit hours in the following subjects:**

Topics include taxonomy, distribution, and ecological characteristics of trees and other important plants; physiology of trees, including metabolism and growth; basic and applied genetics; ecological concepts and principles, including structure and function of ecosystems; soil formation, classification, composition, and properties; silviculture, including methods of establishing and controlling the composition, growth, and quality of forest stands, including fire ecology and use of fire; water in forest ecosystems, including plant-water relationships, watershed condition and forest water quality; entomology and pathology, including the study of representative forest organisms and the application of integrated pest management; and wildlife and fish biology and ecology.

#### **B. Management of Forest Resources, and Forest Resource Policy and Administration**

##### **Minimum of 6 semester credit hours in the following subjects:**

Integrated forest resource management at stand, system and landscape scales, with consideration of wood, forage, water, wildlife, fish, recreation, cultural, educational and aesthetic benefits; forest engineering, harvesting and utilization as appropriate to program goals.

This area of study integrates all aspects of forestry education. It provides the student with an understanding of the social, cultural, political, legal, economic, institutional, and historical influences on forestry. Topics should include policy development, administration, land and resource planning, budgeting, and financial and personnel management.

#### **C. Measurement of Forest Resources**

##### **Minimum of 3 semester credit hours in the following subjects:**

Topics include land measurement, geographic information systems, photogrammetry and remote sensing; sampling theory and methods; measurement of trees, forests, and forest products; wildlife habitat assessment; measurement of water yields and quality; assessment of air quality and of the aesthetic, cultural, mineral, range, recreation, and wilderness values of forests.

Students are advised that these requirements do not necessarily meet the educational requirements to qualify for Federal service in forestry. Students desiring to meet the Federal requirements should consult with their Major Professor to determine how these requirements can be satisfied.

## NAU COURSES SATISFYING REMEDIAL COURSEWORK REQUIREMENT

The following courses offered at NAU satisfy the remedial coursework requirement in the distribution categories as described.

### A. Forest Ecology and Biology

FOR 212	Trees and Forests of North America	2
FOR 220	Introduction to Forest and Range Plants	2
FOR 380	Ecological Restoration Principles	3
FOR 398	Environmental Hydrology	3
FOR 452	Forest Pathology	3
FOR 453	Forest Insects	3
FOR 454	Forest Health	3
GGR 452	Nature and Properties of Soils	3
FOR 500	Ecosystem Science and Management Principles	3
FOR 504	Forest Wildlife Ecology and Management	3
FOR 521	Forest Soils	3
FOR 544	Landscape Ecology	3
FOR 550	Forest Tree Ecophysiology	3
FOR 552	Forest Tree Diseases	3
FOR 553	Forest Entomology	3
FOR 554	Integrated Forest Health	3
FOR 563	Watershed Hydrology	3
FOR 580	Ecological Restoration Principles	3

### B. Management of Forest Resources, and Forest Resource Policy and Administration

PRM 301	Recreation Economics	3
PRM 346	Wildland Recreation Management	3
FOR 381	Forest Ecosystem Management	3
FOR 382	Ecological Restoration Applications	3
FOR 415	Developing World Forest	2
FOR 440	Benefit-Cost Analysis	3
FOR 445	Wilderness Management	3
FOR 500	Ecosystem Science and Management Principles	3
FOR 503	Management Science Modeling for Multi-Resource Management	3
FOR 506	Watershed Restoration	3
FOR 515	Forestry in Developing Countries	2
FOR 541	Wood Products	3
FOR 551	Fire Ecology and Management:Lab	3:1
FOR 573	Issues in Recreation Management	3
FOR 582	Ecological Restoration Applications	3
FOR 593	Natural Resource Economics	3

### **C. Measurement of Forest Resources**

FOR 211	Forest Mapping and Measurement	3
FOR 524	Aerial Photo Interpretation	3
FOR 525	Geographic Information Systems	4
GGR 320	Introduction to Remote Sensing	4
GGR 422	Remote Sensing Techniques I	4
GGR 423	Remote Sensing Techniques II	4
GGR 424	Remote Sensing Techniques III	2
GGR 433	Survey of Geographic Information Systems	4
STA 575	Applied Sampling	3

### **SPECIAL CONSIDERATION**

Completion of the sixteen credit hours of For 311 - Forest Science A or For 312 - Forest Science B will fulfill all remedial requirements. Completion of the sivicultural section (6 credit hours) of For 311 - Forest Science A will fulfill 3 credit hours of category A (Forest Ecology and Biology) and 3 credit hours of category B (Management of Forest Resources, and Forest Resource Policy and Administration). Graduate courses, offered as FOR 506 Special Studies in Forestry, will fulfill remedial requirements in the distribution categories specified in the syllabus. The Program, Thesis, or Dissertation Committee must approve any other NAU forestry course to be used in satisfying remedial requirements.

### **TRANSFER COURSES SATISFYING REMEDIAL COURSEWORK REQUIREMENT**

Transfer course may be used to satisfy remedial coursework requirements if they meet the spirit and intent of the above described remedial coursework distribution areas. Any transfer course must have significant forestry content, and must be analogous to a course, which fulfills an upper division requirement of a professional forestry program. The use of transfer courses in a remedial coursework program must still adhere to the distribution requirements.

The student's Program, Thesis, or Dissertation Committee must approve all transfer courses. No course allowed for transfer into the Master program required coursework may count as fulfilling the remedial coursework requirement. No course that constitutes part of the maximum of 24 semester credit hours allowed as transfer units into the Ph.D. program may count as fulfilling the remedial coursework requirement.

Coursework from a Society of American Foresters accredited forestry or natural resources program clearly satisfies the spirit and intent of the remedial coursework requirement, and must be placed in the appropriate distribution category in the remedial coursework program. Courses taken at Universities outside the United States may be used as transfer courses, satisfying remedial coursework requirement, as long as they meet the spirit and intent of remedial coursework requirements.

Students who have completed both Phase I and Phase II Peace Corps training in forestry may count this training as nine (9) semester credit hours towards the remedial coursework requirement upon presentation of the necessary documents. The remaining six (6) semester credit hours of remedial work must include coursework in Area B (Management of Forest

Resources and Forest Resource Policy and Administration) and Area C (Measurement of Forest Resources).

### **MAJOR PROFESSOR AND PROGRAM, THESIS, AND DISSERTATION COMMITTEE RESPONSIBILITY**

The Major Professor is expected to thoroughly evaluate the student's academic capabilities and preparation in order to develop the student's remedial coursework requirements. The fifteen (15) semester credit hours is a minimum requirement, and the Major Professor should decide if this requirement is sufficient. The Major Professor will develop, with the student, a recommended program that meets the student's remedial coursework requirements.

The Major Professor shall review any transfer courses to be used to satisfy remedial coursework requirements to insure that they meet the spirit and intent of the above described competency areas. Any transfer courses used to satisfy remedial coursework requirements must be justified in a memo to Program, Thesis, or Dissertation Committee members.

The Program, Thesis, or Dissertation Committee shall also thoroughly evaluate the student's academic capabilities and preparation in regard to the student's remedial coursework requirements. Committee members shall review any recommended transfer courses and justification memo that the Major Professor submits, to insure that the courses meet the spirit and intent of the remedial coursework requirements.

The student's Program of Study submitted during the first semester of residence must include all required remedial coursework, as determined by the Program, Thesis, or Dissertation Committee. After approval by the Program, Thesis, or Dissertation Committee, the Program of Study and justification memo for any transfer credits must be submitted to the Coordinator of Graduate Studies for review prior to submission to the School Chair for approval.

### **COORDINATOR OF GRADUATE STUDIES AND GRADUATE STUDIES COMMITTEE RESPONSIBILITY**

The Coordinator of Graduate Studies and Graduate Studies Committee will revisit the courses specified as fulfilling remedial coursework requirements on a regular basis, and review new courses and special offerings to help determine where they fit in remedial coursework categories. The Coordinator of Graduate Studies will review all Programs of Study, which contain remedial requirements and justification memos for any transfer credits used to satisfy remedial requirements. The Coordinator of Graduate Studies will forward Programs of Study that clearly meet the spirit and intent of remedial requirements to the School Chair for approval. Programs of Study that do not clearly meet the spirit and intent of remedial requirements will be submitted to the Graduate Studies Committee for further review and recommendation.

## **MASTER OF SCIENCE IN FORESTRY (THESIS OPTION)**

### **THESIS COMMITTEE ESTABLISHMENT**

The Graduate Studies Committee will recommend to the Forestry School Chair 1 faculty member to serve as the student's Major Professor. The Major Professor, in conjunction with the student will recommend to the Graduate Studies Committee two additional faculty members to serve on the Thesis Committee. The Forestry Chair must approve the Major Professor and Thesis Committee. Adjunct faculty may serve as members of the Thesis Committee, but not as the Major Professor. The Thesis Committee shall be established within 8 weeks of a student beginning coursework.

### **THESIS COMMITTEE RESPONSIBILITIES**

The Thesis Committee has the following responsibilities:

1. To thoroughly evaluate the student's academic capabilities and preparation in order to develop the student's coursework requirements.
2. Approve the nature and scope of the thesis problem to be studied.
3. Approve the Program of Study including the assignment of all remedial and supplemental coursework.
4. Meet with the student during the first semester of coursework, and at least once a year thereafter, to assess the student's progress in coursework and the thesis.
5. Review the student's draft thesis, approve the thesis, participate in the final oral defense of the thesis, and certify that the student has successfully completed their Program of Study.

### **THE ROLE OF THE MAJOR PROFESSOR**

The Major Professor is expected to carry out the following functions for each graduate student advisee:

1. Function as research advisor, counselor, and mentor for each graduate student. The Major Professor will work very closely with students in all aspects of the graduate program.
2. Working with the student, recommend to the Graduate Studies Committee, two faculty members to serve as members of the student's Thesis Committee.
3. Working with the student, establish a program of courses for the first semester prior to the establishment of the Thesis Committee.
4. Develop, with the student, a recommended Program of Study that meets the needs of the student and the requirements of the graduate program.
5. Ensure that the Thesis Committee meets periodically and functions effectively.

6. Review and approve the student's thesis before submitting it to other members of the student's Thesis Committee.
7. Keep the student informed about what must be done to move smoothly through the graduate program.
8. Organize and administer the student's final oral defense of thesis.
9. Approve the student's application for graduation.

### PROGRAM OF STUDY

By the end of the first semester of coursework the Major Professor, in consultation with the Thesis Committee and the student, must submit an approved Program of Study to the Graduate Admissions and Academic Services. The Program of Study contains a planned series of coursework and academic experiences outlined for each individual student. It clearly specifies required courses and lists a tentative thesis topic. Once a Program of Study has been filed with the Graduate Admissions and Academic Services, a student is expected to adhere to the Program. The Thesis Committee, Graduate Coordinator, School Chair, and the Graduate Admissions and Academic Services must approve any changes in the Program of Study.

The Program of Study form, including any revised Programs of Study, must be completed and sent to the Graduate Admissions and Academic Services, Coordinator of Graduate Studies, Forestry School office, Major Professor, and the student's Thesis Committee.

### **COURSEWORK**

The Major Professor and the Thesis Committee in consultation with the student determine the courses required for each graduate student.

The following general rules should be considered:

1. The Master of Science in Forestry requires 32 semester credit hours including 8 hours of thesis. A minimum of 24 semester credit hours of formal coursework is required. No remedial coursework may satisfy these requirements.
2. For the thesis program all students must take, at a minimum, the 32 credit hours listed below, as well as any required remedial coursework:
  - FOR 690 Research Methods (3)
  - FOR 692 Proseminar (2)
  - STA 570 Statistical Methods I (3) plus 3 hours from:
    - STA 571 Statistical Methods II (3)
    - STA 572 Multivariate Statistical Methods (3)
    - STA 574 Categorical Data Analysis (3)
    - STA 676 Experimental Design (3)
    - BIO 682 Quantitative Biology (3)
    - FOR 603 Forest Biometrics (3)
    - SOC 655 Quantitative Analysis (3)

- Or another graduate-level (500-, 600-, 700-) course with significant content in statistics
  - 13 hours of formal coursework chosen in consultation with the major professor and thesis committee
  - 8 hours of thesis credit (note: more than 8 hours of thesis may be taken, but only 8 hours may be counted toward coursework requirements)
3. All graduate students must maintain a GPA of 3.0 or better. Only 6 hours of grade C are acceptable on the Master's degree program. A grade below C does not earn graduate credit.
  4. No graduate credit is allowed for courses numbered 100-399. With the approval of the Thesis Committee, up to two 400-level courses may be used on a Master's degree program.
  5. The maximum graduate course load is 16 hours/semester. Graduate research assistants may take only 12 hours/semester. The minimum course load for full-time graduate students is 9 hours/semester. Graduate assistants must be full-time graduate students (i.e., must maintain a course load of 9 - 12 hours/semester).
  6. In the summer, all graduate research assistants on a 12-month appointment are required to enroll for at least one credit hour during the term of employment. This may mean one credit hour each in of the five-week sessions or one credit hour during the 10-week session. Note: to be exempt from paying FICA tax on university-paid summer salaries, graduate assistants must enroll at least half time - 2 credit hours for each of the five-week sessions or 5 hours for the ten-week session - and attend classes regularly. If the student is not enrolled at least half time for the period of employment, the graduate assistant and the funding department are liable for FICA tax of 7.65% on the student's gross earnings. The employer's share of FICA charges for graduate assistants paid from grants and local accounts will be charged to the grant or local account.
  7. Graduate students working independently, such as writing their theses, are required to be registered for at least 3 credits. Students away from campus but corresponding with their Major Professor should register for a minimum of 1 credit. During the final semester of a program, whether on or off campus, students should register for 3 credits to reflect demands on faculty time for thesis review.
  8. Contingent on approval of the Major Professor and Thesis Committee, up to 25% of the credits required for the M.S. degree may be transferred to NAU from another graduate institution.
  9. A graduate student may not repeat a course and have the second grade substituted for the first grade. A graduate student, however, may repeat a course, but both grades are used in computing the grade point average.

## **STUDY PLAN**

All students in the Masters program must prepare a detailed study plan for their thesis research. The Study Plan demonstrates that the student has reviewed the literature and outlines in detail how the research will be conducted.



The Study Plan should be completed by the end of the second semester of regular graduate coursework. A major objective of Forestry 690 (Research Methods) is to provide the skills and guidance necessary for each student to complete a successful Study Plan. Research Methods is required of all Master of Science students and fulfills the Study Plan requirement. One copy of the Study Plan shall be placed in the student's academic file.

## **THESIS REQUIREMENTS**

The purpose of a thesis is to give the student experience in carrying out the kind of research he or she may expect to do throughout a professional career. A thesis involves a significant amount of investigation of the literature. It may involve a re-examination or re-evaluation of information generated by others in an effort to confirm or review their conclusions. It may also involve generating new knowledge through original research. In any event, it is intended to demonstrate ability to work independently on a problem, wide familiarity with the literature in the field of the program, command of the techniques and the principles of research, and ability to form valid generalizations from the data used.

No acceptable or unacceptable length to a thesis exists; the nature of the subject must determine the amount of writing necessary. In general, the acceptability of a thesis can be measured by asking whether the study would be suitable for publication in a national refereed research journal in the field. Graduate students in forestry are expected to have at least 1 draft manuscript suitable for publication before graduation.

Detailed thesis format requirements are specified in "The Format Manual" available from the Graduate Admissions and Academic Services. Each graduate student must ensure that their thesis meets general university requirements by working with the Graduate Admissions and Academic Service's Format Editor. Theses in manuscript format are acceptable to the Graduate Admissions and Academic Services and endorsed by the Forestry faculty.

Theses in manuscript format should have all of the same basic components that occur in a normal thesis. The main distinction of a manuscript format thesis is that within the context of the thesis there are 1 to several distinct manuscript chapters. The intent of the manuscript chapter format is to facilitate the preparation of manuscripts for submission to professional journals while completing the thesis requirement. A manuscript format thesis has the usual introduction and literature review (of the entire thesis), then is divided into chapters or manuscripts. Each chapter has a title, preface, abstract, introduction, materials and methods, results, discussion, and literature cited section. The preface is an explanatory statement to aid the reader to understand how the manuscript fits the remainder of the thesis. Following the individual manuscript chapter(s) there is an overall summary of the entire thesis project. Some redundancy may exist in the thesis to maintain integrity of the individual manuscripts, but this should be kept to a minimum. There may also be slight variations in style between manuscripts reflecting different journal requirements. The non-manuscript portion of the thesis should have consistent style. Students are advised to visit with the Graduate Admissions Format Editor well in advance of preparing their thesis.

The following schedule for thesis completion is required of all students:

1. The first draft of the thesis must be provided to the Major Professor at least 8 weeks prior to graduation. The Major Professor must review the thesis and return to the student for revision. The thesis should be submitted for format review by the Graduate Admissions and Academic Services at this time.
2. The revised thesis is to be submitted to the Thesis Committee at least 6 weeks prior to graduation. The Committee will review the thesis within 2 weeks. If a Committee member determines the thesis to be inadequate they may return it to the student with requested revisions.
3. The final revised draft of the thesis should be submitted to the Major Professor at least 4 weeks prior to graduation. Students are expected to carefully consider the comments of their Thesis Committee. The Major Professor has responsibility to ensure that the recommendations of the committee are incorporated into the revised thesis. The Major Professor has final responsibility for thesis approval.
4. The final copies of the approved thesis, including format review, should be submitted to the Graduate Admissions and Academic Services at least 1 week prior to graduation. The student is responsible for all costs associated with thesis production and binding. Students must register for 3 credits of thesis for each semester after the defense until final copies of the thesis are submitted to the Graduate Admissions and Academic Services.

Students should be aware that this is the minimum acceptable time for each review step. The Graduate Admissions and Academic Services estimates the average time required to complete the thesis is 3 months following approval of the format by the Graduate Admissions and Academic Services. Consequently, students are advised to arrange their first format review with the Graduate Admissions and Academic Services Format Editor in the first 2 weeks of the semester they plan to complete the thesis.

## **FINAL EXAMINATION**

The final defense is open to all faculty including adjunct faculty and other professionals by invitation. Normally, the student will begin with a brief summary A final defense of thesis is required for all Master of Science candidates. The of the thesis research (15-30 minutes). The presentation portion of the final defense is open to all students and staff. General questions from the audience are permitted within the 50 minute maximum presentation period. Non-faculty must leave the final defense following the presentation.

The final defense examining committee must consist of at least the Thesis Committee. The Major Professor has the responsibility to ensure that the examination is conducted in a fair and appropriate manner. The Major Professor will direct questions from the examining committee to the student. Questions will be limited to the thesis or general knowledge related to the thesis. An oral examination would normally require extended responses from the student rather than "yes" or "no" answers. Oral examination questions should be designed to allow the student to demonstrate their ability to integrate information gained from coursework and the thesis research project. The Major Professor will determine if questions are appropriate. Following the

examination period (maximum time two hours) the student will be asked to leave the room, while the Major Professor leads a discussion of the examination. All faculty members may discuss the student's performance. However, only the student's Thesis Committee shall vote whether to pass or fail the student. A 2/3 majority of the Thesis Committee members is required to declare that a student has passed the examination. Students will be notified immediately as to the outcome of the examination. The Major Professor must submit a "Report on Final Examination for Masters Degree" to the Graduate Admissions and Academic Services following the examination (See appendix).

The following rules apply to the final oral examination:

1. The examination must be announced to the faculty (via memo) at least 1 week in advance. The exam announcement should be made to other appropriate departments. A copy of the thesis shall be available to all faculty 1 week in advance.
2. The final examination must be taken at least 1 week prior to graduation.
3. The final examination is open to faculty, but is closed to other graduate students. However, graduate students may attend the presentation part of the final examination.

Table 1. Recommended Time Line for Master of Science (Thesis Option)

<b>By no later than ...</b>	<b>Required activity or status:</b>
The end of the first 8 weeks of coursework	<ul style="list-style-type: none"> <li>• Thesis Committee formed</li> </ul>
The end of the first semester	<ul style="list-style-type: none"> <li>• Thesis Committee meets</li> <li>• Program of Study developed and approved by Thesis Committee</li> </ul>
The end of the second semester of coursework (unless remedial course requirements preclude)	<ul style="list-style-type: none"> <li>• Study Plan prepared (Forestry 690 taken)</li> </ul>
The end of the next to last semester of coursework	<ul style="list-style-type: none"> <li>• Apply for graduation</li> </ul>
8 weeks prior to graduation	<ul style="list-style-type: none"> <li>• Draft of thesis to Major Professor</li> <li>• Draft of thesis to Graduate Admissions and Academic Services for format review</li> </ul>
6 weeks prior to graduation	<ul style="list-style-type: none"> <li>• Revised draft of thesis to Thesis Committee</li> </ul>
4 weeks prior to graduation	<ul style="list-style-type: none"> <li>• Final revised draft of thesis to Major Professor</li> <li>• Thesis submitted to Graduate Admissions and Academic Services for second format review (if required)</li> </ul>
1 week prior to graduation	<ul style="list-style-type: none"> <li>• Final copies of thesis submitted to Graduate Admissions and Academic Services</li> <li>• Final oral examination</li> </ul>

## **MASTER OF SCIENCE IN FORESTRY (NON-THESIS OPTION)**

### **MULTI-RESOURCE FOREST MANAGEMENT**

Students seeking a terminal degree that will prepare them for careers as multi-resource managers, as opposed to careers in research and education, normally select the non-thesis option. This option includes the preparation of a professional paper, rather than a research thesis, on a subject relating to multi-resource forest management. Together, the successful completion of the academic coursework and the preparation and defense of the professional paper lead to a Master of Science degree. The student's Program of Study includes all of the multi-resource management core courses, as specified below, plus a selection of courses tailored to the student's personal interests. The Program of Study involves a minimum of 33 semester hours of coursework plus 3 hours of credit for the professional paper, plus any remedial coursework required as part of the admission, and is designed by the student in consultation with the student's Major Professor whose interests complement those of the student. A Program Committee of two additional faculty members also approves the student's Program of Study and the professional paper. Although no set length of time for the Program of Study exists in the non-thesis option, some of the core courses are offered only during alternate years. As a result, most students require 2 calendar years of academic work to complete the program.

The multi-resource forest management core course work requirements are designed to introduce multi-resource management concepts and procedures, together with appropriate theory and analytical techniques. Team assignments may be used to examine important concepts, and students may be required to prepare frequent written reports. Students are exposed to problem-solving principles using computer models, teamwork, and individual study. The development of both oral and written communications skills is an integral and essential part of the program.

Each student in the non-thesis option must prepare a professional paper under the guidance of the Major Professor. Upon the successful completion of the professional paper, which must be acceptable to both the Major Professor and the members of the student's Program Committee, the student presents a seminar that serves as an oral defense of the ideas developed in the professional paper.

### **PROGRAM COMMITTEE ESTABLISHMENT**

The Graduate Studies Committee will recommend to the School Chair 1 faculty member to serve as the student's Major Professor. The Major Professor, in conjunction with the student, will recommend to the Graduate Studies Committee two additional faculty members to serve as the Program Committee. The Program Committee is functionally identical to the Thesis Committee for thesis students. The Chair of the School of Forestry will make the final decision on the membership of the Program Committee. Adjunct Faculty may serve on the Program Committee, but not as the Major Professor. The Program Committee shall be established within 8 weeks of a student beginning graduate coursework.

## ASSIGNMENT OF A MAJOR PROFESSOR

Admission of a student who is otherwise fully qualified for the non-thesis option depends upon the availability and willingness of a faculty member to serve as the student's Major Professor. No student will be admitted to the non-thesis Masters program without a faculty member in the School of Forestry agreeing to act as that student's Major Professor. The Major Professor must be a regular member of the School's faculty. Applicants are encouraged to contact a professor in their field of interest in the School prior to application to establish a basis for acceptance. During the admission process the Graduate Studies Committee of the School of Forestry attempts to match the student's expressed interests with those of a faculty member. If this can be done, and the faculty member is willing to serve as the student's Major Professor, then the student is admitted. The faculty member identified through this process then serves as the student's Major Professor throughout the student's tenure in the program.

## CONVENING THE PROGRAM COMMITTEE

Within the first 8 weeks of the first academic semester following the student's full admission to the non-thesis program, the student and Major Professor together must select and obtain the consent of 2 additional faculty members to serve on the student's Program Committee. Prior to the end of the same semester, the Program Committee will meet and determine: 1) the program of graduate courses to be taken by the student in addition to the program "core" courses; and 2) the general topic the student will address in the professional paper. The Program of Study form, which summarizes this information must then be approved by the Coordinator of Graduate Studies, Chair of the School of Forestry, and submitted to the Graduate Admissions and Academic Services through the Coordinator of Graduate Studies.

## PROGRAM OF STUDY

The Program of Study for the non-thesis option includes a 17-18 semester credit hours of "core courses" required of all non-thesis students. Courses taken in addition to this core depend upon the decision of the student's Program Committee. A Program of Study form, signed by the Major Professor, the members of the Program Committee, and the Chair of the School of Forestry, must be submitted to the Graduate Admissions and Academic Services through the Coordinator of Graduate Studies no later than the end of the first semester of coursework after the student has been fully admitted into the non-thesis option. The minimum Program of Study comprises 33 semester hours of coursework, plus 3 semester hours of credit for the professional paper. Students may enroll in additional courses, but must satisfactorily complete all of the courses indicated in the Program of Study. Each graduate student is required to maintain a 3.0 grade-point average for all courses taken and must also maintain a 3.0 grade-point average for all courses required in the student's program. Only 6 semester hours of graduate coursework with a grade of "C" are acceptable on the master's degree program.

## NON-THESIS PROGRAM COURSEWORK REQUIREMENTS

The courses required for each graduate student are determined by the Major Professor and the Program Committee in consultation with the student.

The Non-Thesis Program has the following coursework requirements:

1	<u>Required Courses (8 hours):</u>		
	FOR 690	Research Methods	3
	FOR 692	Pro Seminar I	2
	STA 570	Statistical Analysis I	3
2	<u>Core Courses (17-18 hours):</u>		
	You must take at least 2 courses from each of the forestry emphasis areas listed under the Ph.D. coursework requirements.		17-18
3	<u>Elective Courses (7-8 hours):</u>		
	You must take 7-8 hours of electives, chosen in consultation with your committee.		7-8
4	<u>Professional Paper (3 hours):</u>		
	FOR 689	Professional Paper	3
	TOTAL REQUIRED:		36

## COURSE LOADS

For graduate students, 9 credit hours during fall and spring semester and the 10-week summer session are considered to be full-time enrollment. The minimum full-time course load is 9 credit hours during fall or spring semester, and 16 hours is the maximum (12 hours for graduate assistants).

In the summer, all graduate research assistants on a 12-month appointment are required to enroll for at least one credit hour during the term of employment. This may mean one credit hour each in of the five-week sessions or one credit hour during the 10-week session. Note: to be exempt from paying FICA tax on university-paid summer salaries, graduate assistants must enroll at least half time - 2 credit hours for each of the five-week sessions or 5 hours for the ten-week session - and attend classes regularly. If the student is not enrolled at least half time for the period of employment, the graduate assistant and the funding department are liable for FICA tax of 7.65% on the student's gross earnings. The employer's share of FICA charges for graduate assistants paid from grants and local accounts will be charged to the grant or local account.

## THE PROFESSIONAL PAPER

Each student in the non-thesis option of the graduate program in multi-resource forest management is required to prepare a professional paper under the supervision of the student's Major Professor. The Major Professor must also convene a Program Committee of 2 additional faculty members who approve the student's Program of Study and also serve as readers for the professional paper. The professional paper will be granted 3 semester hours of graduate credit on a Pass/Fail basis through Forestry 689, Professional Paper.

## REQUIREMENTS OF THE PROFESSIONAL PAPER

1. The final product must be a manuscript of length appropriate for submission to a professional journal and judged by the Major Professor and the members of the student's Program Committee to represent "publishable quality" with respect to a relevant refereed journal. Actual publication, with the Major Professor as co-author, is encouraged but not required.
2. The paper should have a multi-resource management orientation. It may address a specific multi-resource management field problem, or it might have a more philosophical or theoretical orientation. Examples of professional paper topics might include the following:
  - an article describing the multi-resource management philosophy and practices of Native Americans;
  - a literature review relating to specific multi-resource management policies or activities of an agency such as the USDA Forest Service;
  - an essay on the potential application of multi-resource management principles to community forestry in the tropics;
  - a paper describing the utility of technology such as an electronic spreadsheet or geographical information system for solving multi-resource management problems;
  - an analysis of potential local, regional, national, or international economic impacts associated with multi-resource management as compared to commodity-oriented management;
  - an analysis of a complex local, regional, national, or international natural resources problem that has implications for multi-resource management;
  - a compilation of background material that might form the basis for a research proposal relating to multi-resource management;
  - results of pilot studies, establishment of research methodologies for future analysis.

We recognize that some of these topics might not be publishable in professional journals. Such topics could nevertheless be acceptable if, in the opinion of the Major Professor and the student's program committee, the resulting manuscript meets the standard of publishable quality.

3. The student must present a seminar to faculty and graduate students based on the professional paper. The seminar may not be scheduled until both the Major Professor and the members of the student's Program Committee are satisfied that the professional paper meets the standards of professional quality outlined above. This seminar along with appropriate responses to questions from the faculty, will satisfy the requirement for the oral examination. The Program Committee must vote to pass the student by a 2/3 majority. The Major Professor must submit a "Report on Final Examination for Masters Degree" to the Graduate Admissions and Academic Services following the examination.

### IDENTIFYING THE TOPIC FOR THE PROFESSIONAL PAPER

Prior to the end of the first semester of coursework, the student and the Major Professor will jointly identify a topic to be used for the student's professional paper. The subject of the professional paper may be suggested by either the student or the Major Professor, but must be agreed upon by both. After the topic has been identified, it must then be approved by the student's Program Committee.

### DEVELOPING A STUDY PLAN FOR THE PROFESSIONAL PAPER

As soon as possible after beginning the Program of Study, the student will enroll in Forestry 690, Research Methods. As part of the required work for this course, the student will prepare a Study Plan. If appropriate, the Study Plan should relate to the study to be undertaken in conjunction with the preparation of the professional paper. The student should consult the Major Professor regularly during the preparation of the Study Plan to ensure that the plan is relevant to the professional paper.

### COMPLETING AND DEFENDING THE PROFESSIONAL PAPER

The student may complete the professional paper either during the regular academic semester or during the summer, depending upon both the student's schedule and on the Major Professor's availability for consultation during the summer. The paper must be presented to the Major Professor at least 8 weeks prior to the anticipated date of the paper presentation so that the Major Professor can read the professional paper and if necessary ask for revisions before submitting it to the other members of the student's Program Committee. The final draft of the paper must be presented to the Program Committee at least 4 weeks prior to the anticipated date of the defense. Only after the paper is acceptable to both the Major Professor and the Program Committee will the seminar be scheduled. The seminar is open to faculty members and to graduate students. The seminar must be held no later than 1 week prior to the deadline set by the Graduate Admissions and Academic Services for the submission of all materials required for graduation. The professional paper must be bound and placed in the library using policies identical to that of a thesis.



Table 2. Summary Of Important Deadlines for Master of Science (Non-Thesis Option)

<b>By no later than ...</b>	<b>Required activity or status:</b>
The end of the first 8 weeks of coursework	<ul style="list-style-type: none"> <li>• Student and Major Professor select and obtain the consent of 2 faculty members to serve as members of the student's Program Committee.</li> </ul>
The end of the first semester of coursework	<ul style="list-style-type: none"> <li>• Student and Major Professor, together with the program committee, meet and determine: 1) the program of graduate courses to be taken by the student in addition to the program "core" courses; and 2) the general topic the student will address in the professional paper. The Program of Study form, which summarizes this information, must then be approved by the Chair of the School of Forestry and submitted to the Graduate Admissions and Academic Services through the Coordinator of Graduate Studies.</li> </ul>
End of the first spring semester of coursework	<ul style="list-style-type: none"> <li>• Student completes a Study Plan as part of the required work in Forestry 690, Research Methods. If appropriate, this Study Plan should relate to the work done in association with the preparation of the professional paper.</li> </ul>
Beginning of the final semester of coursework	<ul style="list-style-type: none"> <li>• Student obtains from the Graduate Admissions and Academic Services a copy of the form "Application for Graduation (Masters or Doctorate)" and submits it to the Graduate Admissions and Academic Services via the Major Professor with a copy to the Coordinator of Graduate Studies.</li> </ul>
8 weeks prior to the final oral presentation	<ul style="list-style-type: none"> <li>• Student submits a draft of the professional paper to the Major Professor.</li> </ul>
4 weeks prior to the final oral	<ul style="list-style-type: none"> <li>• Major Professor sends the revised draft of the professional paper to the members of the student's Program Committee.</li> </ul>
1 week prior to graduation	<ul style="list-style-type: none"> <li>• If the Major Professor and the Program Committee members agree that the professional paper is acceptable, the student presents a seminar to faculty members and graduate students. The purpose of the seminar is to give the student an opportunity to summarize and defend the ideas developed in the professional paper. If the seminar is satisfactory, the Major Professor, members of the Program Committee, and Chair of Forestry submit to the Dean of the Graduate Admissions and Academic Services the Report on Final Examination for Masters Degree.</li> </ul>

# **DOCTOR OF PHILOSOPHY IN FORESTRY**

## **DOCTOR OF PHILOSOPHY DEGREE**

The Doctor of Philosophy (Ph.D.) degree is the terminal degree offered in the profession of forestry. Students with the Ph.D. degree normally pursue a career in research and/or education. Ph.D. students are expected to demonstrate skill in the generation of original ideas, considerable command of the literature, skill at designing, analyzing, and interpreting research, skill in scientific writing including the publication of research results in major professional refereed journals and basic skills in teaching. Ph.D. students are expected to be self-motivated and largely direct their own research program with advice and counsel from the Major Professor and Dissertation Committee. The Ph.D. is a research degree that should be evaluated based on the originality and quality of the new knowledge generated.

The School of Forestry offers three (3) Ph.D. emphasis areas: Ecosystem Science, Forest Management Sciences and Economics, and Forest Social Science.

## **DISSERTATION COMMITTEE ESTABLISHMENT**

The Graduate Studies Committee will recommend to the Forestry Chair a faculty member to serve as Major Professor. The Major Professor and the student will recommend at least three additional faculty members to serve as the Dissertation Committee. One member of the Committee shall be a faculty member from outside the School. Adjunct faculty may serve on the Dissertation Committee but not as the outside member. The Forestry Chair recommends a Committee to the Graduate Admissions and Academic Services who officially appoints the Dissertation Committee.

The Major Professor and the student arrange a class schedule for the first semester. The Dissertation Committee shall be established and have their first meeting within 8 weeks of a student beginning coursework.

## **COURSEWORK**

The Major Professor and the Dissertation Committee in consultation with the student determine the courses required for each graduate student.

The following general rules should be considered:

1. The Doctor of Philosophy in Forestry requires 63 semester hours including fifteen hours of dissertation. A minimum of 48 hours of formal coursework is required. No remedial coursework may satisfy these requirements.
2. A maximum of 24 credit hours of coursework completed during the Master's degree may be credited to the 48 credit hours requirement. The student must complete 13 credit hours of required courses, 5-7 credit hours of breadth of study outside their emphasis area, and 15 credit hours of emphasis area courses.

3. All students in the Doctor of Philosophy in Forestry must take FOR 690, FOR 692, FOR 693, STA 570, and 3 hours from STA 571, STA 572, STA 574, STA 676, BIO 682, FOR 603, SOC 655, or another graduate-level (500-, 600-, 700-) course with significant content in statistics, unless they have completed these courses or equivalent courses during their Master's degree. FOR 693 must be taken as part of the Ph.D. program. Doctoral students may request credit for FOR 692 based on demonstration of proficiency in preparing and presenting scientific talks and posters. Proficiency will be shown within the first year of enrollment by presentation of a departmental seminar based on previous research (e.g., M.S. thesis), and public presentation of a poster based on previous research in the Forestry Building. The seminar and poster will be evaluated using the same methods used in FOR 692 by School of Forestry faculty and FOR 692 instructors and students. The Doctoral student's dissertation committee will use all evaluation information to assess whether the seminar and poster meet requirements for passing FOR 692. If the requirements are not met, the student must complete FOR 692.
4. All graduate students must maintain a GPA of 3.0 or better. Only 6 hours of grade C are acceptable on the Ph.D. degree program. The student must receive a "B" or better in the fifteen credit hours selected in the emphasis area.
5. No graduate credit is allowed for courses numbered 100-399. Under certain restrictions, up to 9 hours of 400 level courses may be used on a Ph.D. degree program.
6. The maximum graduate course load is 16 hours/semester. Graduate research assistants may take only 12 hours/semester. The minimum course load for full-time graduate students is 9 hours/semester. Graduate assistants must be full-time graduate students (9-12 hours/semester) except as noted under the credit load section.
7. All graduate research assistants on a 12-month appointment must enroll for at least one credit during the summer. This credit should be taken in the 10-week summer session.
8. On campus graduate students working independently, such as writing their dissertations, are required to be registered for at least 3 credits. Students away from campus but corresponding with their Major Professor should register for a minimum of 1 credit. During the final semester of a program, whether on or off campus, students should register for 3 credits to reflect demands on faculty time for dissertation review.
9. Contingent on approval of the Major Professor and Dissertation Committee, any number of the credits required for the Ph.D. degree may be transferred to NAU from another institution.
10. A graduate student may not repeat a course and have the second grade substituted for the first grade. A graduate student may repeat a course, but both grades are used in computing the grade point average.

## **COURSEWORK REQUIREMENTS**

A total of 63 credits is required for the Ph.D. degree as outlined below:

1. A minimum of 15 dissertation credit hours is required.
2. A minimum of 48 credits hours of coursework (beyond the Bachelor's degree) that includes:
  - A minimum of 39 credit hours of 500-600 level courses;
  - A maximum of 9 credit hours of 400 level courses, subject to Committee approval;
  - A maximum of 24 credit hours of coursework completed during a Masters degree, which may be credited to the 48 credit hour requirement.
3. All doctoral students must take the following 13 hours:
  - FOR 690 Research Methods (3)
  - FOR 692 Proseminar I (2)
  - FOR 693 Teaching Practicum (2)
  - STA 570 Statistical Methods I (3) plus 3 hours from:
    - STA 571 Statistical Methods II (3)
    - STA 572 Multivariate Statistical Methods (3)
    - STA 574 Categorical Data Analysis (3)
    - STA 676 Experimental Design (3)
    - BIO 682 Quantitative Biology (3)
    - FOR 603 Forest Biometrics (3)
    - SOC 655 Quantitative Analysis (3)
    - Or another graduate-level (500-, 600-, 700-) course with significant content in statistics
4. You must also take 15 hours in your emphasis. (You must take at least two of these courses at NAU and get your committee's approval for any courses taken elsewhere.)
5. You must also take two courses (5-7 credit hours) to satisfy breadth requirements: students must take at least one course from each of the two other emphasis area categories outside their area of emphasis.
6. You must also take 13-15 hours of electives.

The following section list graduate courses, which constitute Ph.D. emphasis areas:

### **ECOSYSTEM SCIENCE EMPHASIS**

FOR 500 Multi-resource Forest Management Principles	3
FOR 504 Forest Wildlife Ecology & Management	3
FOR 515 Forestry in Developing Countries	2
FOR 521 Advanced Topics in Forest Soils and Ecosystem Ecology	3
FOR 544 Landscape Ecology	3
FOR 550 Forest Tree Ecophysiology	3

FOR 551 Fire Ecology and Management: Lab	3:1
FOR 552 Forest Tree Diseases	3
FOR 553 Forest Entomology	3
FOR 554 Integrated Forest Health	3
FOR 563 Watershed Hydrology	3
FOR 579 Ecosystem Ecology	3
FOR 580 Ecological Restoration Principles	3
FOR 582 Ecological Restoration Applications	3
FOR 604 Wildlife Habitat Relationships	3
FOR 611 Forest Ecological Genetics	3
FOR 620 Applied Forest Stand Dynamics	3
FOR 625 Forest Conservation Biology	3
MAT 542:543 Wildlife Population Modeling: Lab	3:2

### **FOREST MANAGEMENT SCIENCES AND ECONOMICS EMPHASIS**

FOR 500 Multi-resource Forest Management Principles	3
FOR 503 Management Science Modeling for Multi-resource Forest Management	3
FOR 524 Aerial Photo Interpretation	3
FOR 525 Geographic Information Systems	4
FOR 541 Wood Products	3
FOR 593 Natural Resources Economics	3
FOR 603 Forest Biometrics	3
FOR 633 Ecological Economics	3

### **FOREST SOCIAL SCIENCE EMPHASIS**

FOR 515 Forestry in Developing Countries	2
FOR 573 Issues in Recreation Management	3
FOR 605 Policy Process in Multi-resource Management	3
GGR 576 Geography of Tourism and Recreation	3
GGR 698 Seminar in Rural Geography (when offered as Planning for Small Communities and Rural Areas)	
POS 555 Science, Politics, and the Environment	3
POS 658 Topics in Environmental Politics	3
POS 659 Environmental Policy	3

Courses offered as Special Studies in Forestry (FOR 506), Advanced Studies in Forestry (FOR 695), or special topics courses offered by other departments can be used to fulfill emphasis or breadth requirements with approval by the dissertation committee. When Faculty offer a FOR 506 or FOR 695 course, they should work with the Graduate Studies Committee to determine the appropriate emphasis area the course satisfies.

Transfer credits may be used to substitute for any of the above courses, except for FOR 693, with the approval of the Dissertation Committee.

## **PROGRAM OF STUDY**

By the end of the first semester of coursework the Major Professor, in consultation with the Dissertation Committee and the student, must submit an approved Program of Study Form. The Program of Study contains a planned series of coursework and academic experience required for the student. Once a Program of Study has been filed with the Graduate Admissions and Academic Services the student is expected to adhere to the Program. Any changes in the Program of Study must be reviewed by the Coordinator of Graduate Studies and approved by the Major Professor, Dissertation Committee, School Chair and the Graduate Admissions and Academic Services.

## **RESEARCH ASSISTANT EXPECTATIONS**

Graduate research assistants are expected to demonstrate qualities of professionalism and academic leadership beyond those normally expected of other graduate students. A graduate assistant is expected to remain in good academic standing and make satisfactory progress toward a graduate degree. This includes: 1) a minimum cumulative GPA of 3.00; 2) no more than 6 hours of grade C; 3) a B or better grade in the fifteen credit hours of emphasis area courses; and 4) completion of at least 9 hours of credit each academic semester. In addition, all Graduate Assistants in their first year, must attend the University Graduate Assistant Orientation offered each Fall prior to the start of classes. This orientation is designed to familiarize Graduate Assistants with the goals of the University and the Assistant's role in achieving these goals. A student who fails to meet any of the above criteria may be asked to appear before a hearing by the Graduate Studies Committee to determine whether support should be continued.

In addition to the above university-wide expectations for graduate assistants, the School of Forestry has established the following conditions of support for Graduate Research Assistants:

1. The Major Professor has control over the Graduate Research Assistant's work schedule. Requests for assistance from a graduate student should always be routed through the Major Professor.
2. Graduate Research assistants are expected to work an average of 20 hours/week (half-time appointment) with the primary objective of conducting their dissertation research. The work schedule may vary but will often include many more hours during the summer.
3. Graduate Research Assistants are not permitted to have employment outside the School.
4. Graduate Research Assistants are expected to be self-motivated and work with minimal supervision from the Major Professor.
5. At the discretion of the Major Professor, Graduate Research Assistants may be required to help on other graduate student and faculty projects.
6. Graduate Research Assistants may occasionally be asked to assist on field trips or in laboratory exercises and present appropriate lectures in their field of study as requested by the Major Professor.

7. Graduate Research Assistants may occasionally be asked to assist in recruitment efforts such as Career Days with approval of the Major Professor.
8. Graduate Research Assistants are expected to become the local expert in their field. They should know as much or more about their field than the Major Professor or any other faculty.
9. Graduate Research Assistants are expected to be members of and participate in professional organizations.
10. Graduate Research Assistants are expected to publish the results of their dissertation research. A draft manuscript may be required before completion of the degree, depending on the Major Professor's requirements. Within the conventional ethical standards for determination of senior authorship, the Major Professor shall have the right to assume senior authorship and submit for publication any manuscript not completed by the student within 1 year of graduation.

The student's Major Professor will determine whether the student has satisfied the above conditions. The Major Professor's assessment of the student's progress will be summarized on the Ph.D. Student Progress Evaluation Form, which is completed each year before February 15, with copies given to the student and placed in the student's School file.

## **COURSE LOADS**

For graduate students, 9 credit hours during fall and spring semester and the 10-week summer session are considered to be full-time enrollment. The minimum full-time course load is 9 credit hours during fall or spring semester, and 16 hours is the maximum (12 hours for graduate assistants).

In the summer, all graduate research assistants on a 12-month appointment are required to enroll for at least one credit hour during the term of employment. This may mean one credit hour each in of the five-week sessions or one credit hour during the 10-week session. Note: to be exempt from paying FICA tax on university-paid summer salaries, graduate assistants must enroll at least half time - 2 credit hours for each of the five-week sessions or 5 hours for the ten-week session - and attend classes regularly. If the student is not enrolled at least half time for the period of employment, the graduate assistant and the funding department are liable for FICA tax of 7.65% on the student's gross earnings. The employer's share of FICA charges for graduate assistants paid from grants and local accounts will be charged to the grant or local account.

After completion of all required course work except dissertation, a resident doctoral graduate student on half-time assistantship may petition to register for 6 credit hours a semester. Such a petition should be approved by the Graduate Admissions and Academic Services and be endorsed by the Faculty Advisor and the School Chair.

## **SEMINAR REQUIREMENTS**

All Ph.D. students must attend the School of Forestry seminar series, unless course or research schedules interfere. In addition, all Ph.D. students are required to present two seminars: 1) presentation of final research results in the departmental seminar series (dissertation defense

seminar); and 2) presentation of a technical paper at a local, state, regional, or national meeting (e.g., Society of American Foresters, Ecological Society of America, Wildlife Society, American Water Resources Association, or other professional organizations). The second seminar must be presented outside the School seminar series and is subject to approval by the student's Major Professor.

## RESEARCH COMPETENCY REQUIREMENT

Before admission to candidacy, Ph.D. students must demonstrate research competence. This competence may be satisfied in one of two ways, as described below.

**The first option** is for a student to demonstrate reading competence in one (1) foreign language. The student's committee will approve the choice of the particular language used to meet this requirement.

Language competency can be demonstrated by taking any one (1) of the following exams:

- An exam administered by the NAU Modern Languages School. Languages available are Russian, German, French, Spanish, and Japanese. Students are encouraged to use this option.
- If there is good reason to use a language other than those listed above, the student may, with the approval of the Dissertation Committee, demonstrate proficiency with 1 of the following:
  - An exam administered by the Educational Testing Service.
  - An exam administered by another Arizona University.

International students whose native language is not English may, with the approval of their Dissertation Committee, petition the Graduate Admissions and Academic Services to recognize proficiency in English as satisfying the language requirement.

**The second option** for completion of the research competency requirement is for a student to complete the following coursework requirements:

- FOR 690 Research Methods (3)
- STA 570 Statistical Methods I (3) plus 3 hours from:
  - STA 571 Statistical Methods II (3)
  - STA 572 Multivariate Statistical Methods (3)
  - STA 574 Categorical Data Analysis (3)
  - STA 676 Experimental Design (3)
  - BIO 682 Quantitative Biology (3)
  - FOR 603 Forest Biometrics (3)
  - SOC 655 Quantitative Analysis (3)
  - Or another graduate-level (500-, 600-, 700-) course with significant content in statistics



## **RESEARCH REQUIREMENTS**

The Ph.D. degree requires a demonstration of considerable independence, research skill and experience in a discipline within forestry. Development of techniques, design of experiments, collection and analysis of data, reporting results in written and oral form, and preparation of research proposals are all skills that should be mastered in this degree program. The choice of a problem and research area is made in consultation with the Dissertation Committee. Dissertation research meets School of Forestry standards when it poses a set of objectives which: 1) are soundly based in the theoretical context of the subject, 2) proceed with a sound design that gives due attention to statistical adequacy, and 3) conclude with findings and inferences that once again are set forth in an appropriate theoretical context. The dissertation must demonstrate that the student has mastered his/her field of specialization, has carried out independent scholarly work, and has contributed significant new knowledge.

The student must prepare a research prospectus that outlines the general research area and identifies the research questions to be answered in their research. A brief overview of methods to be used is included. The research prospectus is generally 3-5 pages in length and must be approved by the Dissertation Committee. A copy is placed in the School file with a copy of the signed prospectus title page submitted to the office of Graduate Admissions and Academic Services.

## **COMPREHENSIVE EXAMINATIONS**

The goal of the Comprehensive Examinations is to ensure that every Ph.D. student has a rigorously demonstrated competence in a breadth and depth of subjects within the larger field of forestry. In addition, students must demonstrate both written and oral communication skills in English at a level that will allow them to effectively communicate their ideas and knowledge to a wide range of audiences.

In general, Comprehensive Examinations should take place near the end of the student's coursework requirements, as directed by the student's Program of Study.

### **COMPREHENSIVE WRITTEN EXAMINATION**

Each student must successfully complete a written comprehensive examination. This examination is separate from, but related to, the student's coursework requirements. The examination will consist of a line of questioning prepared by each member of the student's Dissertation Committee, subject to the review and approval of the student's Major Professor. A line of questioning may include 1 or more questions. A student will have a maximum of 8 hours to prepare a response to the line of questioning provided by each member of the Dissertation Committee. The exact format for preparing responses for a particular line of questioning is at the discretion of faculty member preparing the line of questioning, with the approval of the Major Professor.

The Major Professor must read and evaluate all responses. Only the Committee member responsible for a particular line of questioning must read and evaluate the response to that line, although all committee members are encouraged to read all responses. Any member of the Dissertation Committee may request to review the questions and responses of the student.

The author of each line of questioning, along with the Major Professor, will determine the adequacy of the response to each question, both for its subject matter content and its organization and overall quality as a written document. In the event of a disagreement between the readers, the vote of the entire Committee will determine the adequacy of the response. The student responses to written questions and faculty evaluations of those responses shall become an official part of the student's file. All faculty shall have access to student files.

A student may either pass or fail the examination. A student passes the examination by preparing adequate responses to 2/3 of the lines of questioning. Upon passing the written examination the student becomes immediately eligible for the oral comprehensive examination.

Failure results when the Committee feels that the student has not prepared adequate responses to a majority of the lines of questioning. In this case, the student has the opportunity to retake the failed portions of the examination. New lines of questioning may be substituted for those in the original examination. Students are not required to retake those portions of the examination where responses were judged adequate. A student has only 1 opportunity to retake any or all of the written examination.

If the student fails the second written examination the student will be immediately dropped from the Ph.D. program. The student may reapply for admission after 1 year (2 semesters). Readmission will be subject to the same requirements as specified for those students applying to the program at the time the application is made.

The Major Professor must inform the student of the outcome of the written examination within 14 days of the time the last examination responses were received from the student. Results of the written examination must be reported to the Graduate Admissions and Academic Services on the "Report of Results of Written Comprehensive Examination" Form.

### COMPREHENSIVE ORAL EXAMINATION

The comprehensive oral examination can only be scheduled after the successful completion of the written examination. All Dissertation Committee members must attend the oral examination. The examination should focus on the following topics:

1. Clarification of or expansion on any of the responses to the written examination;
2. A presentation by the student to the Committee on the student's research plan and any preliminary results; and
3. Any other topics agreed upon by the Committee.

Generally, the oral examination should continue for 2-3 hours. At the end of the discussions, the student will be asked to leave the Committee so that the members can discuss the student's performance. The Major Professor must inform the student as to the Committee's decision within 1 hour of the examination's completion.

Students either pass or fail the oral examination. A vote of 2/3 of the Dissertation Committee is required to pass the student. If passed, this qualifies the student for candidacy provided all other candidacy requirements have been successfully completed.

The Major Professor must provide to a student failing the oral examination the reasons for the adverse decision. A student failing the oral examination must retake the examination within 60 days. A student failing the oral examination a second time will be immediately dropped from the Ph.D. program. The student may reapply for admission after 1 year (2 semesters). Readmission will be subject to the same requirements as specified for those students applying to the program at the time the application is made. The results of the oral examination must be reported on the "Report of Results of Oral Comprehensive Examination" Form.

## **ADMISSION TO CANDIDACY**

A student must apply for candidacy on the form "Application for Candidacy for the Doctoral Degree." The application is approved by the Major Professor, the School Chair, and the Graduate Dean. Admission to candidacy should be obtained during the semester prior to graduation and must be granted at least 90 days before the Dissertation Defense Examination.

The requirements for admission to candidacy include:

1. A Program of Study approved by the Committee, the School Chair, and the Graduate Dean.
2. Completion of all coursework on the Program of Study except the dissertation.
3. A dissertation prospectus approved by the Committee with a copy of the signed prospectus title page on file with Graduate Admissions and Academic Services.
4. Demonstration of the research competency requirement.
5. Completion of the oral and written comprehensive examination requirements.
6. Completion of residency requirements.

## **DISSERTATION REQUIREMENTS**

Dissertation requirements are outlined in the Graduate Catalog (under Thesis and Dissertation Requirements) and in "The Format Manual" available at the Graduate Admissions and Academic Services. The student is expected to conform with the style of presentation currently accepted by the Graduate Admissions and Academic Services in preparing all drafts of a dissertation.

Two types of dissertation formats are acceptable. The traditional format includes general chapters for introduction, methods, results, and discussion. An alternative to the traditional style is a series of papers either submitted, or prepared for submission, to professional journals, with additional introductory and concluding chapters as required by the "The Format Manual." The student and Dissertation Committee must agree upon the choice of a specific format. Dissertations in manuscript format should have all of the same basic components that occur in a normal dissertation. The main distinction of a manuscript format dissertation is that within the context of the dissertation there are one to several distinct manuscript chapters. The intent of the manuscript chapter format is to facilitate the preparation of manuscripts for submission to professional journals while completing the dissertation requirement. A manuscript dissertation has the usual introduction and literature review (of the entire dissertation), then is divided into chapters or manuscripts. Each chapter has a title, preface, abstract, introduction, materials and methods, results, discussion, and literature cited section. The preface is an explanatory statement

to aid the reader to understand how the manuscript fits the remainder of the dissertation. Following the individual manuscript chapter(s) there is an overall summary of the entire dissertation project. Some redundancy may exist in the dissertation to maintain integrity of the individual manuscripts, but this should be kept to a minimum. There may also be slight variations in style between manuscripts reflecting different journal requirements. The non-manuscript portion of the dissertation should have consistent style. Students are advised to visit with the Graduate Admissions and Academic Services Format Editor well in advance of preparing their dissertation.

The following schedule for dissertation completion is required of all students:

1. The first draft of the dissertation must be reviewed by the Major Professor, revised by the student, and approved again by the Major Professor prior to distribution to the Dissertation Committee. This initial review should be made well in advance of the dissertation defense examination (minimum of 8 weeks). At this time students should submit their Dissertation for format review by the Graduate Admissions and Academic Services.
2. The revised dissertation is to be submitted to the Dissertation Committee at least 4 weeks prior to dissertation defense examination. Committee members must provide feedback on the dissertation within 2 weeks if their changes are to be incorporated into the final draft of the dissertation. The Major Professor has responsibility to ensure recommendations of the Committee are incorporated into the revised dissertation.
3. The dissertation in final draft form, including all figures, tables, and references, must be provided to the Graduate Admissions and Academic Services at least 2 weeks before the date of the dissertation defense exam. The copy for the Graduate Admissions and Academic Services must be submitted with the completed and signed Dissertation Defense Scheduling Form, available from the Graduate Admissions and Academic Services. This copy will be read by the representative from Graduate Council who is assigned to attend the defense.
4. Signed copies of the dissertation are to be delivered to the Graduate Admissions and Academic Services before the last day of the semester of expected graduation. Students must register for 3 credit hours of dissertation each semester after the defense until final copies of the dissertation are submitted to the Graduate Admissions and Academic Services.

The student has financial responsibility for all aspects of dissertation preparation.

## **DISSERTATION DEFENSE**

A defense of the dissertation is required for all Ph.D. candidates. The dissertation defense shall be held within 4 years of the oral comprehensive exam. If this time is longer than 4 years, the oral exam must be repeated. The dissertation defense must occur no sooner than 90 days following admission to candidacy. The defense should be scheduled at least 4 weeks prior to expected date of graduation. The student must complete the Dissertation Defense Scheduling Form.

The defense will be scheduled immediately following the dissertation defense seminar in the departmental seminar series. The dissertation defense seminar is open to the public. The length of the dissertation defense seminar will be limited to 50 minutes, including questions which may be asked by the audience. The dissertation defense will convene within 20 minutes following the seminar. The defense is restricted to faculty and, at the minimum, must include the entire Dissertation Committee and an observer from outside the School of Forestry, appointed by the Graduate Admissions and Academic Services. The observer reports to the Graduate Admissions and Academic Services on the conduct of the exam and may ask questions, but does not vote. Only Dissertation Committee members can vote on the student's performance in the defense. The maximum time for the dissertation defense (following the seminar) is 2 hours.

At least 4 weeks notice of the defense must be provided to all Committee members. All Committee members must also be provided a copy of the dissertation for review at least 4 weeks prior to the defense. The dissertation must be in final form prior to the defense. It is the Major Professor's responsibility to determine when the dissertation is ready to be defended. However, the Committee can delay the defense if the dissertation is judged to be inadequate.

The Major Professor has the responsibility to ensure that the defense is conducted in a fair and appropriate manner. Questions will be asked by each member of the Dissertation Committee, and by other faculty in attendance upon approval of the Major Professor. Questions will be limited to the dissertation or knowledge related to the dissertation. Defense questions should be designed to allow the student to demonstrate ability in interpreting the results of the dissertation research and in discussing the results in relation to current scientific understanding.

Following the defense, the student will be asked to leave the room, while the Major Professor leads a discussion of the examination. A passing vote by a 2/3 majority of the Committee members is required to pass the defense. If a student fails their first defense, they will be given another opportunity to defend. The second defense should be scheduled within 6 months of the first defense. Students will be notified immediately as to the outcome of the defense. The Major Professor must submit a "Report on Final Oral Examination for Ph.D. Degree" to the Graduate Admissions and Academic Services following the defense.

## **STUDENT TEACHING REQUIREMENT**

All Ph.D. students benefit by gaining some teaching experience. Teaching skills are important for Ph.D. students and provide valuable experience needed in the highly competitive job market. For this reason, the School of Forestry requires all Ph.D. students, regardless of the type of financial support, to have some teaching experience. However, the teaching expectation in the School of Forestry may vary depending on financial support, the year of residence, level of competency in teaching, and approvals by the School Chair, Major Professor and Dissertation Committee.

All Ph.D. students are required to participate in the teaching of an established course in order to gain teaching experience. Such participation will include preparing 2 to 4 lectures, delivering them in the presence of a faculty instructor, and developing test questions based on the material presented in class. The Dissertation Committee must approve the proposed teaching experience.

All teaching by Ph.D. students must be evaluated by the student's Major Professor or course instructor using the "Ph.D. Student Teaching Evaluation" Form.

Students who successfully complete FOR 693 Teaching Practicum may use this course to fulfill their student teaching requirement, subject to approval by their Major Professor and Dissertation committee. In this case, the FOR 693 instructor will evaluate students' teaching performance using the criteria and evaluation form developed for FOR 693.

### **RESIDENCY REQUIREMENTS**

The student must spend 2 consecutive semesters of full-time study in residence at NAU after formal admission to the Ph.D. program. Residency is defined as carrying a minimum load of 9 credit hours of Committee-approved courses during a semester or 5 approved hours during a summer session.

## **APPLICATION FOR GRADUATION**

All graduate students in the M.S. and Ph.D. programs must make a formal application for graduation. A student should apply for graduation early in the semester in which graduation is expected. Forms and information on deadlines are available in the Registrar's Office and the Graduate Admissions and Academic Services. The application process includes payment of a graduation fee.

In signing the form, the Major Professor asserts that the graduate student is making sufficient progress to be able to defend the thesis, professional paper, or dissertation prior to the end of the semester.

## FINANCIAL ASSISTANCE

There are 2 broad categories of financial support available to students in the School of Forestry. The first, a research assistantship, is awarded by the School on the basis of academic merit and ability to conduct research in collaboration with a faculty member. The second category is based on demonstrated financial need. Financial assistance based on financial need is administered by the Office of Student Financial Aid, P.O. Box 4108, Flagstaff, AZ 86011-4108 (520-523-4951), with programs described in a brochure titled Financial Aid, available from that office. For both kinds of support, offers of assistance are made only after the student is admitted into the graduate program.

Research assistantships for students in the School of Forestry are available from two sources: 1) a variable number of assistantships are supported by state funds, and 2) a variable number of assistantships may be available through externally supported research grants. In both cases, assistantships are awarded to individual faculty members who are responsible for selecting students. Criteria for selecting a student for an assistantship may vary among faculty members, but must include a high likelihood of excellent academic performance and ability to conduct independent research of high quality. Inquiries about the availability of assistantships should be made to the Coordinator of Graduate Studies and to faculty doing research in the area in which the student is interested.

State supported Ph.D. assistantships are awarded to individual faculty members based on the recommendation of the Graduate Studies Committee and approval by the School Chair. State supported assistantships include funds for graduate student stipend and a waiver of the difference between in-state and out-of-state tuition. State supported assistantships will be awarded to faculty based on the scientific merit of the proposed project, the current existence or high likelihood of obtaining external funds to adequately support all costs associated with the project other than the assistantship stipend and the identification of a qualified student. State supported Ph.D. assistantships will typically be limited to 1 per faculty member. Students supported on all state funded research assistantships are required to provide 5 hours/week of service to the School for their first semester on support. The nature of the service requirement will be determined by the School Chair and Major Professor.

Students who receive research assistantships provided to faculty members through external grants are typically employed to perform research or other work specified in the grant. This may involve assisting the faculty member with data collection, data analysis, and writing reports so that the faculty member can meet their obligations to the granting agency. In many cases, the work done by the student may be an important component of their thesis or dissertation research. However, the student's use of such data for their research must be approved by the faculty member responsible for the research. Further, such use of data does not relieve the student of the obligation to provide data, reports, or other products to the faculty member responsible for the research. Faculty members and their students supported by externally funded assistantships should agree to the student's responsibility to the project and the use of project data before initiation of any work by the student.



All half-time assistantships include a waiver of the difference between in-state and out-of-state tuition, a commitment of 20 hours per week, and a course load of 9-12 credit hours per semester (note exceptions under "Credit Load" section). All graduate assistants are required to pay the usual in-state tuition and other registration fees. No student will be permitted to receive more than the approved maximum amount of financial assistance for a half-time assistantship regardless of the source. The only exception to this rule is that students may receive scholarships to cover tuition in addition to the assistantship stipend. In addition, assistantships may occasionally be awarded at less than the half-time rate depending on the needs of a research project and the availability of funds. Graduate students who receive half-time assistantships are not permitted to have outside employment. The Graduate Studies Committee will periodically review assistantship stipend rates and recommend changes as appropriate.

State supported M.S. Research Assistantships are limited to 2 years. There is no specific limit on externally funded M.S. Research Assistantships. State-supported Ph.D. assistantships typically will be provided for four years. However, only students who make good progress in the first year of their program will be considered for continued support. There is no limit on the total number of years of support for Ph.D. assistantships funded by external grants. The duration of support for assistantships funded by external grants will depend on the student's performance and the availability of funds. In addition, assistantship support may be withdrawn at any other time that a student's overall performance is judged inadequate by the Major Professor.

## STUDENT'S ROLE IN THE SCHOOL

A graduate student occupies a special place in the School and the University; in many ways closer to the faculty than to the undergraduate student. Thus, high expectations exist for responsibility, honesty, and professional behavior at all times. These qualities are developed and observed through interactions with faculty, other graduate students, and visiting scientists, dissertation research, participation in seminars, attendance at departmental seminars, and attendance and presentation of papers at scientific meetings. Evaluation concerning a student's professional competence and ability to interact with people is based on the student's participation in these diverse activities.

Students carry significant responsibilities in School teaching, research, and administration. Many are employees of the School, University, and State, and we all are representatives of the School on campus and anywhere we conduct our professional activities. Therefore, graduate students are expected to exhibit high professional standards, to be knowledgeable about School affairs, faculty and student activities, and in general conduct themselves in a professional manner.

Graduate students are encouraged to join and participate in the activities of appropriate professional societies. The benefits of membership, including journals and newsletters, are generally available to students at very favorable rates for dues.

There are many informal opportunities to learn from fellow students with experience from other parts of the United States and the World. One can learn a great deal by helping others, sharing work efforts, and studying together. Cooperation and social interaction with fellow students are strongly encouraged.

Nearly all of our activities entail the use of facilities, equipment, and operational budgets provided through State and Federal Governmental funds. Our use of State vehicles, which are clearly marked "For Official Use Only", is an especially sensitive and obvious area of concern. Anyone using University property for reasons other than those intended is liable for legal prosecution and/or dismissal. Telephones, copy machines, postage, vehicles, etc. may not be used for personal reasons. If there is doubt about the difference between official and private action, check with your Major Professor.

Common courtesy requires that students ask permission before using facilities or equipment not already assigned to their project. Although some equipment is kept in common storage areas, it may well be considered the "property" of a specific research project, laboratory, or teaching area, and others may be depending on finding the equipment there when they need it. Requests for equipment should be directed to the equipment manager. If that individual is not available, talk to a faculty member whose interests might involve those materials. All equipment should be signed out and returned in clean working order. Report any problems to the equipment manager so that they can be corrected.

A priority system based on financial support and degree sought is used to assign desk space as available to graduate students. First priority is given to all funded students based on seniority.

When all funded students are allocated space then non-funded students may be assigned space on a seniority system. Full-time research associates, technicians, or post-doctorals may be placed in the graduate student areas if space is not available elsewhere.

It is the responsibility of the Major Professor to notify the School Chair of the impending arrival of new students or the return of old ones. Time of such notification is used to establish precedence within each priority level. Once assigned a desk, the student is expected to utilize it to the fullest. Space is a scarce resource. Infrequently used desks will be assigned to another student.

Appropriate keys are issued to students by the School Chair upon written request by the Major Professor. Security demands that you safeguard keys issued to you and not lend them to others. It is illegal to duplicate university keys. Also, students should be very conscious about locking doors when they enter the building or laboratories outside of general business hours.

## **ACADEMIC CONDUCT OF GRADUATE STUDENTS**

Graduate research should entail the generation of original, truthful information. Academic misconduct includes any of the following deceptive practices:

- Falsification of data: the intentional and unauthorized altering or inventing of any information or citation, including the purposeful omission of conflicting data with the intent to falsify.
- Plagiarism: knowingly representing the works or ideas of another as one's own.
- Misappropriation of others ideas or data.
- Misrepresentation of academic credentials.

Allegations of academic misconduct should be brought immediately to the attention of the Major Professor and the School Chair. The Major Professor and School Chair shall immediately conduct a preliminary investigation to ascertain the legitimacy of the alleged misconduct. Allegations of misconduct that are substantiated at this level shall be reported to the Graduate Admissions and Academic Services for appropriate University level action.

## **GRIEVANCE PROCEDURES**

Students with significant complaints on any aspect of their training in the School should address such complaints directly to the person causing the grievance, the Grievance Committee Chair, or the University Ombudsman in order to reach a settlement. If this approach fails to achieve the desired results, the student's Major Professor should be consulted and should attempt an agreeable settlement. If the grievance is not resolved at this level the student should take it to the School Chair. When none of the above attempts are successful, a written statement that details the nature of the complaint should be submitted by the student to the Grievance Committee. The Grievance Committee is a standing Committee of three Forestry faculty members and 2 graduate forestry students appointed each academic year by the Forestry School Chair to handle grievance complaints and grade appeals. The Committee is chaired by 1 of the faculty members, and should one of the faculty on the Committee be the apparent cause of the complaint, the School Chair will appoint a new member. After deliberating on the grievance, the Committee will notify the student orally and in writing of its decision to either accept the grievance and to correct the matter or find the grievance unfounded. Should the student remain unsatisfied with a decision at the School level, following appeals are to be directed to the Graduate Admissions and Academic Services.

Grade appeals will be treated as described in the University Student Handbook.

## APPENDIX A FORESTRY GRADUATE STUDENT FORMS

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**Application For Admission To The M.S. And Ph.D. Programs**

NORTHERN ARIZONA UNIVERSITY  
SCHOOL OF FORESTRY  
FLAGSTAFF, ARIZONA, U.S.A. 86011-5018

**1. NAME:**

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Last	First	Middle
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**2. SOCIAL SECURITY NUMBER:**

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**3. CONTACT INFORMATION:  
PRESENT ADDRESS:**

---

**PERMANENT ADDRESS:**

---

**TELEPHONES:** Home: \_\_\_\_\_ School/Work: \_\_\_\_\_

**Email:** \_\_\_\_\_

**4. CITIZENSHIP:** \_\_\_\_\_

**5. GENDER:** \_\_\_\_\_ Female \_\_\_\_\_ Male

**6. RESIDENCY:** \_\_\_\_\_ Arizona resident \_\_\_\_\_ Not an Arizona resident

**7. ETHNIC ORIGIN (Optional: Used for Governmental Reporting Only):**

_____ White	_____ Black or African American
_____ Asian	_____ Hispanic
_____ Native American and Alaska Native (Predominant Tribal affiliation): _____	
_____ Native Hawaiian and Other Pacific Islander	
_____ Other _____	

**8. WHICH GRADUATE DEGREE SOUGHT:**

\_\_\_\_\_ M.S. (Thesis) \_\_\_\_\_ M.S. (Non- \_\_\_\_\_ Ph.D.

\_\_\_\_\_ thesis) \_\_\_\_\_

9. WHEN DO YOU WISH TO BEGIN STUDY AT NAU?      Fall 20      Spring 20  
\_\_\_\_\_

**10. EDUCATIONAL EXPERIENCE:**

<u>Institution</u>	<u>Location</u>	<u>Dates</u>	<u>Degree Major/Minor</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

**11. PUBLICATIONS AND THESES:** (please list with co-authors here or on an attached sheet)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**12. SPECIAL EXPERIENCE OR INTERESTS THAT RELATE TO YOUR CHOSEN FIELD OF STUDY.** Detail on an attached sheet.

**13. CHOICE OF STUDY:**

Please list, in order of preference, fields which you would consider for study. These should be compatible with faculty interests (see the enclosed information). We strongly advise you to contact faculty to insure that they have space available and will review your application. A faculty member must have reviewed your application and be willing to serve as your advisor in order for you to be accepted.

FIELD OF STUDY	PERTINENT FACULTY MEMBER(S)	FACULTY CONTACTED
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

IF YOUR INTERESTS DO NOT MATCH THOSE OF PRESENT FACULTY, PLEASE INDICATE THOSE INTERESTS (faculty may be capable of directing research in other areas):

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_





**14. MATERIALS REQUIRED FOR APPLICATION:** To be considered for graduate study by the Graduate Selection Committee, each applicant must have the following items on file in the School of Forestry by 15 March for Fall admission and 15 October for Spring admission.

- a. Completed APPLICATION FOR ADMISSION TO THE GRADUATE PROGRAM
- b. Transcripts of all undergraduate and graduate course work.
- c. Three letters of recommendation.
- d. Scores for the General section of the Graduate Record Examination (GRE).
- e. Your statement of interests and goals.
- f. TOEFL score for international students.

**15. TRANSCRIPTS WILL BE PROVIDED BY THE FOLLOWING SCHOOLS:**

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**16. RECOMMENDATIONS WILL BE PROVIDED BY THE FOLLOWING INDIVIDUALS:**

NAME	TITLE/POSITION	INSTITUTION/ORGANIZATION
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

**17. SCORES ON THE GRADUATE RECORD EXAMINATION:** (official scores should be sent directly to the School from the Educational Testing Service)

Date Taken:	_____	Date Repeated:	_____
	Score	% Below	Score
	_____	_____	_____
Verbal	_____	_____	_____
Quantitative	_____	_____	_____
Analytical	_____	_____	_____

**18. TOEFL Score for International Students:**

Score \_\_\_\_\_ Date Taken \_\_\_\_\_

- 19. Please attach a STATEMENT OF RESEARCH INTERESTS AND PROFESSIONAL/ CAREER GOALS (250-500 words).** The Forestry Faculty carefully reviews and rigorously evaluates an applicant's Statement of Interest, and this evaluation is an important determinant in the admission decision. The Statement should reflect careful consideration of interests and goals. The quality of the submission, in terms of grammar, sentence structure, and appearance are also key elements evaluated since they reflect an applicant's command of written English. Since the Faculty believe that written language skills are vital to the success of graduate education, applicants are advised to carefully and thoughtfully complete this item. Please type or word process your submission.

Note: Admission to the Graduate Program assures the student that facilities exist to pursue research interests and that a Major Professor is available to direct that research. Admission to the program does not, however, guarantee continued support if the student elects to change field or professor, if satisfactory progress is not made toward a degree, or if programs are discontinued.

- 20. ADDRESS FOR SUBMISSION OF APPLICATION MATERIALS:** This form and other materials necessary for application to the program must be submitted to:

Coordinator of Graduate Studies  
School of Forestry  
P.O. Box 15018  
Northern Arizona University  
Flagstaff, Arizona 86011-5018

If you have questions about any aspect of the application form or procedure, please call the School office at (928) 523-3031.

**Thank you for considering Northern Arizona University for your continued study.**

\_\_\_\_\_  
APPLICANT'S SIGNATURE

\_\_\_\_\_  
DATE

## Recommendation For Graduate Study

SCHOOL OF FORESTRY  
 NORTHERN ARIZONA UNIVERSITY  
 NAU BOX 15018 FLAGSTAFF, AZ 86011-5018

for \_\_\_\_\_  
 (First) (Middle) (Last)

Please read the following carefully before issuing or completing this form:

**TO THE CANDIDATE:** Please check one of the following options before you send or give this form to the person recommending you. This form will not be accepted if you fail to designate the option of your choice or fail to sign below.

PLEASE  
 CHECK  
 ONLY ONE  
 OPTION

- NON-CONFIDENTIAL RECOMMENDATION.** The above-named person elects to keep this recommendation non- confidential recommendation may be shown to the candidate at his or her request.
- CONFIDENTIAL RECOMMENDATION.** I elect to keep this recommendation confidential and I waive all my rights of access to this recommendation, whether visual, oral or written, as provided in the Family Educational Rights and Privacy Act of 1974 and its amendments. I understand that this recommendation will not be available for my inspection now or in the future.

Date: \_\_\_\_\_  
 Candidate's Signature and Date (Must be signed to be valid)

**TO THE RECOMMENDER:**

The person whose name appears on this form wishes to ask you for a recommendation regarding his or her qualifications for graduate study in forestry. Your honest and careful statement and evaluation will be appreciated. Please rate this applicant in comparison with other students of the same age and position.

Please check appropriate box for each category	No Basis for Judgment	Lower Half	Upper Half but not Upper 25%	Upper 25% but not Upper 2%	Upper 2%
Native Intellectual Ability					
Breadth of General Knowledge					
Initiative and Resourcefulness					
Interest in Their Field					
Oral Expression Ability					
Written Expression Ability					
Ability to Work with Others					
Emotional Maturity					
Promise as a Teacher					
Promise as a Researcher					
Independence					

In what capacity do you know this person \_\_\_\_\_ and for how long? \_\_\_\_\_

This space is for additional comments.

\_\_\_\_\_  
 (Type or print your name) (Title or position) (Signature)

Date \_\_\_\_\_ Your Employer \_\_\_\_\_

Mail Completed form to: Coordinator of Graduate Programs, School of Forestry, Box 15018, Northern Arizona  
 Form modified: July 01, 2001





**Report On Final Examination For Masters Degree**  
NORTHERN ARIZONA UNIVERSITY  
SCHOOL OF FORESTRY

Candidate's Name \_\_\_\_\_

Degree Title \_\_\_\_\_

Major in \_\_\_\_\_

Thesis Option \_\_\_\_\_ Non-Thesis Option \_\_\_\_\_

Vote of Committee: Passed \_\_\_\_\_ votes

Failed \_\_\_\_\_ votes

(Two out of three votes to pass are required)

Committee Members' Signitures:

\_\_\_\_\_ Major Professor

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

School Chair

Date

Distribution: Major Professor  
Thesis Committee Members  
School File  
Graduate College  
Student

Form modified: July 05, 2001

**Program of Study for Ph.D. Program**  
 NORTHERN ARIZONA UNIVERSITY  
 SCHOOL OF FORESTRY

Name _____	Student ID _____
Local _____	Local Telephone _____
Address _____	Home Telephone _____
_____	Undergraduate GPA _____

Date Admitted \_\_\_\_\_

Expected Graduation Date \_\_\_\_\_

<b>Graduate Record Examination</b>		
Component	Score	% Below
Verbal		
Quantitative		
Analytical		

Emphasis Area: \_\_\_\_\_

<i>Remedial Courses</i>	<i>Semester</i>	<i>Credit Hours</i>	<i>Grade</i>



<i>Courses Required</i>	<i>Semester</i>	<i>Credit Hours</i>	<i>Grade</i>
<b>A. Required of All Students</b>			
Forestry 690: Research Methods		3	
Forestry 692: Proseminar I		2	
Forestry 693: Teaching Practicum		2	
Statistics Requirement (6 credit hours):			
<b>B. Breadth Requirements (2 courses, 5-7 credit hours)</b>			
<b>C. Emphasis Area Requirements (15 credit hours)</b>			
<b>D. Electives (13-15 credit hours)</b>			

**Transfer Credits** (This section summarizes, and repeats, transfer courses used to meet above degree requirements - do not include transfer courses used to fulfill remedial requirements).

<i>Course Title</i>	<i>Institution</i>	<i>Grade Received</i>	<i>Semester Credits</i>	<i>Requirement Substituted For:</i>

Total hours required in the program: \_\_\_\_\_

Tentative Dissertation Title: \_\_\_\_\_

Dissertation Committee:	Name	Signature	Date
<i>Major Professor</i>			
<i>Committee Members</i>			
Review (if req.)	Graduate Coordinator		
<i>Approval</i>			
	Dean		

Distribution: Major Professor  
 Thesis Committee Members  
 School File  
 Graduate College (original)  
 Student

Form modified: August 20, 2003

**Ph.D. Student Progress Evaluation Report**  
NORTHERN ARIZONA UNIVERSITY  
SCHOOL OF FORESTRY

(To Be Submitted On An Annual Basis)

*STUDENT'S NAME:* \_\_\_\_\_

*STUDENT'S ID NUMBER:* \_\_\_\_\_

*EVALUATION DATE:* \_\_\_\_\_

**I. COURSEWORK**

- A. Have courses in Program of Study been completed as scheduled? Yes \_\_\_\_ No \_\_\_\_  
If not, explain reasons for non-completion, and

Detail the steps anticipated to complete the courses

- B. Is performance in coursework satisfactory? Yes \_\_\_\_ No \_\_\_\_  
If not, explain the steps anticipated to correct unsatisfactory performance

- C. If completion or satisfactory performance issues were noted at the last evaluation, discuss the progress on the plan(s) to address these issues

- D. Comments

- E. Overall Coursework Progress Evaluation: Satisfactory \_\_\_\_ Unsatisfactory \_\_\_\_

*II. RESEARCH AND DISSERTATION PREPARATION*

A. Has performance and progress on the dissertation research been satisfactory? Yes \_\_\_\_ No \_\_\_\_

If not, detail the steps anticipated to achieve satisfactory progress

B. If completion or satisfactory performance issues were noted at the last evaluation, discuss the progress on the plan(s) to address these issues

C. Comments

D. Overall Research: Satisfactory \_\_\_\_ Unsatisfactory \_\_\_\_

*III. OVERALL EVALUATION:* Satisfactory \_\_\_\_ Unsatisfactory \_\_\_\_

	SIGNATURES	DATE
Major Professor:	_____	_____
Committee Members:	_____	_____
	_____	_____
	_____	_____
Student	_____	_____

Distribution: Major Professor  
School File  
Student

Form modified: July 05, 2001



- Participation in Meetings, Preparation Sessions, and Completion of Out-of-Class Assignments

**Overall Teaching Evaluation:**

Satisfactory \_\_\_\_\_ Unsatisfactory \_\_\_\_\_

- Comments

	SIGNATURES	DATE
Major Professor:	_____	_____
Evaluators	_____	_____
Student	_____	_____

Distribution: Major Professor  
 School File  
 Student

Form modified: July 05, 2001

## Report On Results Of Written Comprehensive Examination

NORTHERN ARIZONA UNIVERSITY  
SCHOOL OF FORESTRY

This evaluation is completed following the completion of coursework requirements as detailed in the School of Forestry Graduate Student Policies and Procedures Handbook.

STUDENT'S NAME: \_\_\_\_\_

STUDENT'S ID NUMBER: \_\_\_\_\_

EXAMINATION DATE: \_\_\_\_\_

Committee Members	Signature	VOTE	
		PASS	FAIL (1)

(1) Committee members failing a student must attach a written explanation of reasons for a failing grade.

COMMITTEE VOTE: (two-thirds vote needed to pass)

PASSED \_\_\_\_\_ VOTES

NOT \_\_\_\_\_ VOTES

PASSED \_\_\_\_\_

ADDITIONAL REQUIREMENTS (IF ANY) AND JUSTIFICATION:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_  
School Chair's Signature

\_\_\_\_\_  
Date

Distribution: Major Professor  
Thesis Committee Members  
School File  
Graduate College  
Student

Form modified: July 05, 2001





## Report On Results Of Oral Comprehensive Examination

NORTHERN ARIZONA UNIVERSITY  
SCHOOL OF FORESTRY

This evaluation is completed following the completion of coursework requirements as detailed in the School of Forestry Graduate Student Policies and Procedures Handbook.

STUDENT'S NAME: \_\_\_\_\_

STUDENT'S ID NUMBER: \_\_\_\_\_

EXAMINATION DATE: \_\_\_\_\_

Committee Members	Signature	VOTE	
		PASS	FAIL (1)

(1) Committee members failing a student must attach a written explanation of reasons for a failing grade.

COMMITTEE VOTE: (two-thirds vote needed to pass)

PASSED \_\_\_\_\_ VOTES

NOT \_\_\_\_\_ VOTES

PASSED \_\_\_\_\_

ADDITIONAL REQUIREMENTS (IF ANY) AND JUSTIFICATION:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_  
School Chair's Signature

\_\_\_\_\_  
Date

Distribution: Major Professor  
Thesis Committee Members  
School File  
Graduate College  
Student

Form modified: July 05, 2001



# Application For Candidacy For The Doctoral Degree

NORTHERN ARIZONA UNIVERSITY

TO BE COMPLETED BY STUDENT:

Name \_\_\_\_\_ Id Number \_\_\_\_\_

Mailing Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Telephone: Home \_\_\_\_\_ Work \_\_\_\_\_

Degree program (check):

\_\_\_\_\_ Ed.D. - Educational Leadership \_\_\_\_\_ Ph.D. - Applied Linguistics \_\_\_\_\_ Ph.D. - History  
\_\_\_\_\_ Ed.D. - Educational Psychology \_\_\_\_\_ Ph.D. - Biology \_\_\_\_\_ Ph.D. - Political Science  
\_\_\_\_\_ Ed.D. - Curriculum & Instruction \_\_\_\_\_ Ph.D. - Forest Science \_\_\_\_\_

Signed \_\_\_\_\_ Date \_\_\_\_\_

\*\*\*\*\*

TO BE COMPLETED BY THE DEPARTMENT:

Comprehensive Examinations Written (date passed) \_\_\_\_\_  
Oral (date passed) \_\_\_\_\_

Language proficiency examination or research competency satisfied:(date) \_\_\_\_\_

Residency requirement satisfied: \_\_\_\_\_ When: \_\_\_\_\_

\_\_\_\_\_ The student above has met departmental requirements for candidacy  
\_\_\_\_\_ The dissertation topic has been approved and a signed prospectus title page is attached  
\_\_\_\_\_ A program of study is attached or is on file in the Graduate College

Signed \_\_\_\_\_ Date \_\_\_\_\_  
Major advisor

Signed \_\_\_\_\_ Date \_\_\_\_\_  
Department Chair or Designee

The members of the dissertation committee are:

\_\_\_\_\_  
\_\_\_\_\_

\*\*\*\*\*

TO BE COMPLETED BY THE GRADUATE COLLEGE:

\_\_\_\_\_ Graduate program submitted and approved  
\_\_\_\_\_ Dissertation prospectus submitted and approved  
\_\_\_\_\_ Residency verified  
\_\_\_\_\_ Exams verified

Candidacy: Approved \_\_\_\_\_ Deferred \_\_\_\_\_ Denied \_\_\_\_\_

Signed \_\_\_\_\_ Date \_\_\_\_\_  
Graduate College

Form modified: July 05, 2001

**Dissertation Defense Scheduling Form**  
**Graduate College**  
**Northern Arizona University**

This signed form *and* a copy of the dissertation *must* be in the Graduate College office (Ashurst Room #A107) at least two full weeks (ten working days) before the dissertation defense. (Please note that this copy of the dissertation will be reviewed by the representative from the University Graduate Committee who will attend the defense. This copy will *not* be used for a format review. The format review is a separate process; students must contact the Graduate College's Format Editor directly for such a review preferably a few weeks before the defense.).

\_\_\_\_\_  
Student's Name \_\_\_\_\_ Major \_\_\_\_\_  
Dissertation Title \_\_\_\_\_

The committee members listed below have read the final draft of the dissertation and agree that it is ready for defense. (Only the dissertation committee chair's signature is required – it verifies that all committee members agree that the dissertation is ready for defense.)

\_\_\_\_\_  
Dissertation Committee Chair's Signature \_\_\_\_\_ Date \_\_\_\_\_

**To verify committee members, list names**

Committee Chair \_\_\_\_\_  
Committee Member \_\_\_\_\_ Committee Member \_\_\_\_\_  
Committee Member \_\_\_\_\_ Committee Member \_\_\_\_\_

**The oral defense is scheduled for:**

Date and Time \_\_\_\_\_ Place \_\_\_\_\_

\_\_\_\_\_  
Department Chair's or designee's Signature \_\_\_\_\_ Date \_\_\_\_\_

\_\_\_\_\_  
Graduate College approval \_\_\_\_\_ Date \_\_\_\_\_

Form modified: July 05, 2001

