GRADUATE STUDENT HANDBOOK

Policies and Procedures for Graduate Studies

School of Forestry Northern Arizona University

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CHAPTER 1 – INTRODUCTION

This handbook applies to all Master of Science, Master of Forestry, and Ph.D. students in the School of Forestry admitted for the Fall 2021 semester or later. Students admitted before this semester have the option of continuing under either the previous requirements or these requirements.

- To speak with someone about the graduate program, please contact the current Graduate Coordinator, <u>ForestryGradCoordinator@nau.edu</u>
- Information about graduate programs at NAU can be found on the Graduate College website: <u>https://nau.edu/graduate-college</u>

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 NAU Graduate College requirements is available in the on-line Graduate catalog (http://catalog.nau.edu/) and on the Graduate College website (https://nau.edu/graduate-college). Some of the information presented in those documents is duplicated here for clarity. The Graduate College has final authority on all policy matters. Changes in Graduate College policy usually automatically change School of Forestry policies and procedures. This handbook is housed online under the School of Forestry webpage: https://nau.edu/forestry/internal-resources/graduate-student-handbook/

It is the student's responsibility to become aware of and adhere to all policies and requirements established by the Graduate College and the School of Forestry. The final responsibility for meeting all School, Graduate College, and University requirements and deadlines rests with the student.

CHAPTER 2 - ADMISSION TO GRADUATE PROGRAMS

A. ADMISSION REQUIREMENTS FOR ALL FORESTRY GRADUATE PROGRAMS

- A minimum grade point average of 3.0 (on a 4.0 point scale) in all college and university work is required for admission. The prospective Major Professor of an applicant may petition for admittance of a student with a lower grade point average. Such a petition must clearly explain why an exception should be granted.
- 2. No student will be admitted to either the master's or the Ph.D. programs without a faculty member in the School of Forestry agreeing to serve as that student's major professor. The major professor must be a regular member of the School's faculty, or a Research Professor in the School of Forestry. Applicants are encouraged to contact a professor in their field of interest in the School before application to establish a basis for acceptance.
- 3. International students applying to the graduate program who lack a college degree from the United States (U.S.) must take the and arrange for submission of their scores to the Graduate College as part of the admission application. Detailed information can be found here: <u>https://nau.edu/graduate-college/international-graduate-admission/;</u> basic information is summarized below.

If English is not your native language, you must provide proof of English proficiency from *one* of the following testing agencies:

- <u>Test of English as a Foreign Language (TOEFL)</u> Scores are sent directly to NAU from ETS NAU's Institutional Code is 4006.
- <u>DuoLingo</u> Scores are sent directly to NAU from DuoLingo
- International English Language Testing System (IELTS) Scores are sent directly to NAU from IELTS. The address to send IELTS scores is:

Center for International Education- NAU Attention: Meaghan Gruber 523 S Knoles Drive PO Box 5598 Flagstaff, AZ 86011

- The English proficiency test requirement is waived for the following applicants: native speakers of English; holders of a bachelor's or master's degree from a U.S. university; and holders of college or university degrees where English was the primary language of instruction.
- ii. Applicants who do not achieve the minimum English proficiency test score but meet other admission criteria may be admitted conditionally and required to complete the Program in Intensive English (PIE; <u>http://nau.edu/CAL/PIE/Program-Overview/</u>) in the first semester of enrollment.

B. ADMISSION REQUIREMENTS FOR THE MASTER OF FORESTRY (M.F.) AND MASTER OF SCIENCE (M.S.F.) PROGRAMS

1. REQUIREMENTS FOR STUDENTS WITH A BACHELOR OF SCIENCE DEGREE IN FORESTRY If you are a successful applicant for the Master of Forestry (M.F.) or the Master of Science in Forestry (M.S.F.) 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), you will be admitted with regular standing.

2. REQUIREMENTS FOR STUDENTS WITHOUT A BACHELOR OF SCIENCE DEGREE IN FORESTRY

Successful applicants for the M.F. and the M.S. programs 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 admitted conditionally.

- A conditional admission means you will be required to complete at least 15 semester hours of foundation coursework in forestry with an average grade of "B" or higher. The intent of these requirements is to assure that a student who graduates with an M.F. or M.S. has a breadth of knowledge in forestry. The student's thesis committee or major professor may specify additional foundation requirements.
- *Note:* Some students may be conditionally admitted based on a low undergraduate grade point average (GPA). Such students need to successfully complete a full semester of coursework and achieve 'A' and 'B' grades in all courses to achieve regular admission.

C. 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 post-baccalaureate degrees with demonstrated scientific research outputs equivalent to a master's thesis may qualify a student for admission.
 - Examples include:
 - a Master of Arts with a thesis requirement,
 - a non-thesis master's degree with research outputs such as primary author of peer reviewed publications.
- Students lacking a master's degree or similar post-baccalaureate degree can

demonstrate competence in scientific research by having substantial research experience, such as authorship 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 for the Ph.D. program lacking a master's or similar post-baccalaureate degree must meet admission requirements for grade point average in all college and university coursework, and GRE scores, with no exceptions.

1. REQUIREMENTS FOR STUDENTS WITH A BACHELOR OF SCIENCE DEGREE IN FORESTRY

If you are a successful applicant for the Ph.D. 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), you will be admitted with regular standing.

2. REQUIREMENTS FOR STUDENTS WITHOUT A BACHELOR OF SCIENCE DEGREE IN FORESTRY

Successful applicants for the Ph.D. 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 admitted conditionally.

- These students must complete, at a minimum, 9 semester hours of foundation coursework in forestry with an average grade of 'B' or higher. The student's dissertation committee may specify additional foundation requirements.
- These requirements must be successfully completed before the student can advance to Candidacy. See Chapter 7 for further details.

D. APPLICATON PROCESS

- All applications and supporting materials are submitted online through the NAU Graduate College (https://nau.edu/graduate-college). To apply for fall semester admissions, submit all materials by February 15. For spring semester admissions, submit all materials by October 15.
 - Applications received after these dates, including those partially complete, will receive consideration only after full consideration of completed applications received by the deadline.
- Applicants may be provided earlier deadlines by specific faculty. For example, those filling competitive graduate assistantship positions or meeting other fellowship deadlines may need to evaluate applications early.

All applicants must submit the following application materials as part of their application:

1. English language proficiency test scores (International Students Only): International student applicants must request Educational Testing Services (ETS) to

submit official scores directly to the NAU Graduate College.

If English is not your native language, you must provide proof of English proficiency from *one* of the following testing agencies:

- <u>Test of English as a Foreign Language (TOEFL)</u> Scores are sent directly to NAU from ETS NAU's Institutional Code is 4006.
- DuoLingo
 Scores are sent directly to NAU from DuoLingo
- International English Language Testing System (IELTS) Scores are sent directly to NAU from IELTS. The address to send IELTS scores is:

Center for International Education- NAU Attention: Meaghan Gruber 523 S Knoles Drive PO Box 5598 Flagstaff, AZ 86011

- 2. **Transcripts:** Applicants must request official transcripts of all college and university work to be submitted directly to the NAU Graduate College.
- 3. Statement of Research Interests and Professional/Career Goals: Applicants must submit a detailed Statement of Intent (250 to 500 words in length) that clearly defines the applicant's educational and professional background, interests, and career objectives. An electronic copy of this statement can be attached to the online application to the Graduate College.
- 4. Three letters of recommendation: Applicants must have three letters of recommendation to support their application. Applicants are encouraged to arrange for recommendations from individuals with whom they have recent familiarity. One letter of recommendation can be from the student's proposed major professor.

CHAPTER 3 - GRADUATE COORDINATOR AND MAJOR PROFESSOR RESPONSIBILITIES

The establishment and review of School of Forestry graduate policies and procedures are the responsibility of the Graduate Coordinator, in collaboration with the Executive Director and faculty. This Coordinator and Executive Director will recommend to the faculty changes in this document when Graduate College policies change and when policies herein no longer serve the interest of the Forestry Graduate Program. The faculty must approve all policies and procedures.

A. RESPONSIBILITIES OF THE GRADUATE COORDINATOR

The Graduate Coordinator is a member of the School of Forestry faculty appointed by the Executive Director of the School of Forestry. The responsibilities of the Graduate Coordinator are:

- 1. Correspond with prospective School of Forestry graduate students.
- 2. Prepare reports and documents on graduate programs, including program assessment.
- 3. Represent the School of Forestry as necessary in relations with the Graduate College and the University Graduate Council.
- 4. Inform faculty in the School of Forestry of changing procedures and programs in graduate education at NAU.
- 5. Screen graduate student applications to the School of Forestry, make admission decisions, and determine if foundation coursework is required and the number of credits (thesis/dissertation committee determines which courses are required).
- 6. Provide guidance to graduate students and faculty about graduate policies and review graduate student evaluations each semester or annually.
- 7. Serve as the first point of contact for graduate students wishing to discuss concerns about their graduate program or advising.
- 8. Promote, through various media and student recruitment, those programs established above.
- 9. Monitor policies and programs and recommend changes as necessary to the faculty and the Executive Director of the School of Forestry for approval.
- 10. Others as appropriate.

B. MAJOR PROFESSOR RESPONSIBILITIES

The major professor functions as research advisor, counselor, and mentor for the student. The major professor will work closely with students in all aspects of the graduate program. The major professor is also responsible for all of the following program, department, Graduate College, and university procedures. In addition, the major professor is expected to carry out the following functions for each graduate student advisee:

- 1. Meet with the student frequently to ensure student success in coursework, research, and professionalism. Work with the student to develop an improvement plan when appropriate.
- 2. Read and understand the School of Forestry Graduate Handbook and the NAU Graduate College Thesis and Dissertation Committee Roadmap document.
- 3. Working with the student, establish a program of courses for the first semester before the establishment of the thesis/dissertation committee.
- 4. Working with the student, develop a recommended Program of Study and Foundation Course Plan (when required) that meets the needs of the student and the requirements of the graduate program.
- 5. Working with the student, suggest potential thesis/dissertation committee members or profession paper readers (these can be individual external to the School of Forestry if needed) and ensure that the thesis/dissertation committee meets periodically and functions effectively.
- 6. Review and approve the student's thesis, dissertation or professional paper before submitting it to other members of the student's thesis/dissertation committee or professional paper readers for review.
- 7. Keep the student informed about what must be done to move smoothly through the graduate program.
- 8. Complete the graduate student evaluation form each semester or annually.
- 9. Organize and administer the student's final oral presentation and defense of thesis/dissertation for M.S. or Ph.D. degree or final oral presentation for the M.F. degree.

CHAPTER 4 - FULFILLMENT OF FOUNDATION REQUIREMENTS

Graduate students admitted conditionally with a foundation coursework requirement, shall work with their major professor (M.F.) and committee (M.S. and Ph.D.) to design a foundation coursework program that develops basic competency in the field of forestry. NOTE: International students admitted unconditionally who do not have a Forestry degree are also required to undertake foundation Forestry coursework.

- The intent of these requirements is to assure that a student who graduates with a Master of Forestry (M.F.), Master of Science in Forestry (M.S.), or Doctor of Philosophy in Forestry (Ph.D.) has a breadth of knowledge in forestry.
- The courses used to meet foundation requirements should be documented in the form "Foundation Course Plan," which is available in the appendix of this document.

A. FOUNDATION COURSEWORK DISTRIBUTION

Foundation coursework is distributed in the following three areas (adapted from the Society of American Foresters Accreditation Standards):

• Forest Ecology and Biology Minimum of 3 semester credit hours in the following subjects:

- taxonomy, distribution, and ecological characteristics of trees and other important plants;
- physiology and anatomy of trees, including metabolism, growth and structure of wood;
- c. basic and applied genetics;
- d. ecological concepts and principles, including structure and function of ecosystems;
- e. soil formation, classification, composition, and properties;
- f. ecology of regeneration, forest stand dynamics and/or development
- g. fire ecology and use of fire;
- h. water in forest ecosystems, including plant-water relationships, watershed condition and forest water quality;
- i. entomology and pathology, including the study of representative forest organisms and the application of integrated pest management; and
- j. wildlife and fish biology and ecology.
- Management of Forest Resources, and Forest Resource Policy and Administration Minimum of 3 semester credit hours in the following subjects:

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:

- a. policy development;
- b. administration;
- c. land and resource planning;
- d. budgeting; financial and personnel management;
- e. silviculture, including methods of establishing and controlling the composition, growth, and quality of forest stands
- f. integrated forest resource management at stand-, system-, and landscapescales, with consideration of wood, forage, water, wildlife, fish, recreation, cultural, educational, and aesthetic benefits;
- g. forest engineering, harvesting, and utilization.

Measurement of Forest Resources

Minimum of 3 semester credit hours in the following subjects:

- a. land measurement, geographic information systems, photogrammetry and remote sensing;
- b. sampling theory and methods;
- c. measurement of trees, forests, and forest products;
- d. wildlife habitat assessment;
- e. measurement of water yields and quality;
- f. assessment of the aesthetic, cultural, mineral, range, recreation, and wilderness values of forests.

B. NAU COURSES SATISFYING FOUNDATION COURSEWORK REQUIREMENT

Chapter 15, Table 1 includes a list of courses offered at NAU that satisfy the foundation coursework requirement in the distribution categories: **A. Forest Ecology and Biology (3 credits)**; **B. Management of Forest Resources, and Forest Resource Policy and Administration (3 credits)**; and **C. Measurement of Forest Resources (3 credits)**

 Other forestry and NAU courses, not listed below, may meet foundation requirements upon approval of the thesis (M.S. students) or dissertation (Ph.D. students) committee, or major professor (M.F. students). This includes certain special offering courses (e.g. FOR 499/599).

C. FOUNDATION COURSEWORK AND DEGREE REQUIREMENTS

Courses taken to meet degree requirements may not be used to fulfill the foundation

coursework requirement. Courses that constitute part of the maximum of 24 semester credit hours allowed as transfer units into the Ph.D. program cannot be used to fulfill the foundation coursework requirement.

D. TRANSFER COURSES SATISFYING FOUNDATION COURSEWORK REQUIREMENT

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

The student's thesis (M.S. students) or dissertation (Ph.D. students) committee or major professor (M.F. students) must approve all transfer courses.

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

E. MAJOR PROFESSOR AND THESIS AND DISSERTATION COMMITTEE RESPONSIBILITIES

Before enrollment or in the first semester of coursework, the student and major professor will meet to discuss the foundation course plan. The student may also request to meet with the Graduate Coordinator to review the plan. Additionally, the major professor and thesis or dissertation committee are expected to thoroughly evaluate the student's academic capabilities and preparation in order to develop the student's foundation coursework requirements. **The 9 semester credit hours are a minimum requirement**, and the major professor and committee should decide if this requirement is sufficient. The major professor shall review any transfer courses to be used to satisfy foundation coursework requirements to ensure that they meet the spirit and intent of the above described competency areas. Students should provide a syllabus for any proposed transfer coursework to facilitate proper evaluation.

After approval of the foundation coursework plan by the major professor (M.F. students), thesis committee (M.S. students), or dissertation committee (Ph.D. students), the "Foundation Course

Plan" form (Appendix) must be submitted to the Graduate Coordinator for review before submission to the Executive Director of the School of Forestry for approval.

F. INTERNATIONAL STUDENTS

International students are encouraged to meet the spirit and intent of the foundation requirements by completing the Foundation Coursework Form if they do not hold an undergraduate degree in forestry.

G. GRADUATE COORDINATOR RESPONSIBILITIES

The School of Forestry Graduate Coordinator will revisit the courses specified as fulfilling foundation coursework requirements on a regular basis and review new courses and special offerings to help determine where they fit in foundation coursework categories. The Graduate Coordinator will review all "Foundation Course Plan" forms. The Graduate Coordinator will forward plans that clearly meet the spirit and intent of foundation requirements to the Executive Director of the School of Forestry for approval. Foundation course plans that do not clearly meet the spirit and intent of foundation requirements to the student for revision.

CHAPTER 5 - MASTER OF SCIENCE IN FORESTRY (THESIS OPTION)

This 32-hour program prepares you for a career in forest research and management. It is appropriate for students who desire advanced training in forestry with a research focus. Master of Science in Forestry students can qualify for the WICHE WRGP program (see https://nau.edu/graduate-college/discount-tuition-rates/) which may allow funding for certain out-of-state students to earn their degree at the rate of 150% of the cost of in-state tuition.

A. THESIS COMMITTEE ESTABLISHMENT

During the first semester following admission, the student will meet with their major professor to discuss thesis committee composition. The thesis committee should be established during the first semester that a student begins coursework. Requirements of the thesis committee composition are:

- The chair(s) of the committee must have earned the degree that the student is seeking (e.g., a faculty member with an M.S. but no terminal degree can advise a student seeking an M.S.).
- The chair of the committee is the major professor. Thesis committees may be cochaired by two faculty. If the chair does not hold a Ph.D., the committee must be cochaired with a School of Forestry faculty member who does.
- At least one additional member of the thesis committee must be faculty, adjunct faculty, or research faculty in the School of Forestry.
- The third (and other additional members) of the thesis committee are typically faculty, adjunct faculty, or research faculty at NAU or at other colleges and universities, but also may include non-university scientists and specialists, such as researchers with governmental agencies or non-governmental organizations.
 - a. Participation on a thesis committee by a person who is not faculty, adjunct faculty, or research faculty at NAU must be approved by the Graduate Coordinator using the "Approval of Outside-NAU Master of Science thesis committee Member" form (<u>https://nau.edu/forestry/internalresources/graduate-student-handbook/</u>; Appendix), which requires attachment of the committee member's vita.
 - b. Adjunct faculty may serve as members of the thesis committee, but not as the major professor.

The Executive Director of the School of Forestry must approve the major professor and thesis committee. Once a committee has been established, faculty who retire may continue to serve on the thesis committee. For NAU graduate school policies about theses, visit: https://www5.nau.edu/policies/client/Details/625?whoIsLooking=All&pertainsTo=All

B. THESIS COMMITTEE RESPONSIBILITIES

The thesis committee has the following responsibilities per the NAU Thesis and Dissertation Committee Roadmap. The committee shall:

- 1. Meet during the first semester of coursework to:
 - a. Approve the Program of Study and Foundation Coursework Plan (if required)
 - Determine the feasibility of the topic for the thesis/dissertation proposal/prospectus, and to permit the student to proceed only after such determination has been made;
- 2. Approve the student's proposal/prospectus and a copy of documentation or email approvals (per departmental requirements) should be recorded and maintained in the department. Approval signifies that the student has permission to proceed with the study as outlined in the proposal/prospectus;
 - a. The committee shall determine whether the student's research is subject to the university policy regarding research on human or animal subjects and advise the student accordingly;
 - b. The committee shall determine the adequacy of the literature review in the prospectus;
 - c. The committee shall review and approve the methodology and any instrument or questionnaire used in data collection;
- 3. Meet at least once per year after the initial meeting;
- 4. Committee members shall offer expertise in their area of study and guidance for the student through all stages of the research, writing, and delivery of the thesis;
- 5. Ensure that the student is familiar with and understands all university policies concerning thesis/dissertation requirements, the handling of dangerous materials, laboratory and fieldwork safety, and maintenance of standards of quality, ethics, and professional performance/behaviors. Review thesis drafts and provide feedback in a timely manner. Depending on circumstances, there should be **no more than a four-week turnaround** review time for each of the committee members to review a thesis, or parts thereof;
- 6. Committee members will discuss any recommendations for revisions or problematic issues with the committee chair and the student;
- 7. The committee is to examine the student's work and to make a final determination of the acceptability of the thesis, and to assist in arranging any oral defense of the thesis in accordance with department and university written policies;
- 8. It is the policy of this university to make all theses available to the public through the library's Institutional Repository (IR) and search engines, as well through NAU's established academic publishing service (ProQuest). On rare occasions, committee members shall assist the student in determining the need for and recommending the withholding of material for publication (embargo) for a specified period of time, generally no more than one calendar year. The committee shall also assist the student in making copyright and open-access versus traditional publishing decisions;

C. 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" form (https://nau.edu/graduate-college/programs-of-study/) to the Graduate College. The Program of Study outlines a planned series of coursework and academic experiences for each student. It clearly specifies required courses. The thesis committee, Graduate Coordinator, and Executive Director of the School of Forestry must approve the Program of Study, including any required revisions. Once a Program of Study has been approved, a student is expected to adhere to the Program.

The "Program of Study" Form, including any revised Programs of Study, must be copied to the Graduate Coordinator, the graduate student's file in the School of Forestry office, the major professor, all members of the student's thesis committee, and the Graduate College.

D. M.S. COURSEWORK REQUIREMENTS

The major professor and the thesis committee, in consultation with the student, will determine the courses required for each graduate student.

The Master of Science in Forestry requires **32 semester credit hours including 8 hours of thesis credits** (FOR 699). You must complete at least **18 hours of formal coursework** i.e, courses other than individualized studies, such as independent studies, directed readings, and research.

- No foundation coursework may satisfy these requirements. The foundation course plan (<u>https://nau.edu/forestry/internal-resources/graduate-student-handbook/</u>) should be completed at the same time as the program of study (POS). Only the POS is uploaded to Louie; copies of the approved foundation course plan are provided to the student, advisor(s) and placed in the official student file. Conditional admission status based on fulfilling foundation course requirements will not be removed until all foundation courses have been completed (or are in progress, if the final semester).
- 2. For the thesis program all students must take, at a minimum, the 32 credit hours listed below, as well as required foundation coursework:
 - FOR 505 Forestry Seminar Series (1)
 - FOR 690 Research Methods (3) (recommend taking first semester of study)
 - FOR 692 Proseminar (2) (recommend taking last semester of study)
 - Six hours of graduate-level (500-, 600-, 700-) courses with significant content in statistics. Examples include:
 - FOR 606 Applied Ecological Data Analysis (3)
 - STA 570 Statistical Methods I (3)
 - STA 571 Statistical Methods II (3)
 - STA 572 Multivariate Statistical Methods (3)
 - STA 574 Categorical Data Analysis (3)
 - STA 676 Experimental Design (3), CCJ 614 Research Statistics (3) OR SOC

655 Quantitative Analysis (3)

- BIO 682 Quantitative Biology (3)
- Other graduate-level courses with significant content in statistics.

Note that STA 570 is a prerequisite for all other 500-level STA courses.

- 12 hours of elective coursework, including at least 6 hours of formal coursework (i.e., courses other than individualized studies, directed readings, and research), chosen in consultation with the major professor and thesis committee.
- Eight hours of FOR 699 thesis credits (note: more than eight hours of thesis may be taken, but only eight hours may be counted toward coursework requirements)
- 3. All graduate students must maintain a GPA of 3.0 or higher. Only six hours of grade "C" are acceptable in the master's degree program. A grade below "C" does not earn graduate credit. A student with more than 6 units of graduate work with a grade of "C" or below cannot continue in a master's or doctoral program, regardless of GPA. Graduate students do not normally repeat courses. But, if a grade of "D" or "F" is received in a graduate course, students may repeat that course, with advisor approval. The repeated course does not replace the grade for the prior course; if a course is repeated, both grades are used in the computation of the overall GPA. Units earned for repeated courses may only be used once to fulfill graduation requirements.
- 4. No graduate credit is allowed for courses numbered 100-399.
- 5. With the approval of the thesis committee, up to two 400-level courses taken at NAU may be used on a master's degree program (requires filing of the "Override Authorization-Audit/Class Links/Out of Career" form, available from the Registrar's website: <u>http://nau.edu/Registrar/Forms-and-Policies/</u>).
- 6. The maximum graduate course load is 16 hours/semester. Graduate Research Assistants may only take a maximum of 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).
- 7. Graduate students working on a thesis are expected to enroll in FOR 699 (Thesis) each fall and spring semester from the semester of first enrollment in FOR 699 until completion of the degree. If you are using research or other university facilities, and/or the professional time of faculty members, you should enroll for at least three credits but a minimum of one is required. During the term you complete and defend your thesis (even if you defend and complete during the summer session), you must enroll for at least one credit.
 - a. *Note:* If you do not maintain continuous enrollment after you have begun work on your thesis and you do not have an approved leave of absence on file with

the Graduate College and wish to resume work, you must submit a new application for admission and register for additional credits of Thesis (FOR 699) in an amount equal to the number of such credits missed while not maintaining continuous enrollment. You can apply for a leave of absence using the approved form: https://nau.edu/graduate-college/forms/

- 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. Transfer courses that are used to meet degree requirements must be submitted to the Graduate College using the online "Petition for Transfer Credit" form: https://nau.edu/graduate-college/forms/. The Graduate College must approve all use of transfer courses to meet degree requirements. Transfer courses older than 6 years must be approved by the Graduate College using the "Petition for Extension of Time Limit" form for master's students, available at: https://nau.edu/graduate-college/forms/.
- 9. Read and follow the guidelines and procedures for NAU master's programs described by the Graduate College at: <u>https://nau.edu/graduate-college/thesis-and-dissertation/</u>.

E. COURSE LOADS

For graduate students, 9 credit hours during fall and spring semesters are considered to be fulltime 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). Credit hours during the summer are not required, unless you are graduating at the end of the summer or completing your defense during the summer.

F. RESEARCH PROPOSAL / PROSPECTUS

All students in the master's program must prepare a detailed proposal / prospectus for their thesis research. This document demonstrates that the student has reviewed the literature and describes in detail how the research will be conducted. The proposal / prospectus should include a working title for the thesis, a statement of research questions or objectives, a literature review related to the research topic, and a brief summary of the proposed research methods or approach.

The proposal should be completed no later than 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 research proposal. Research Methods is required of all Master of Science students and fulfills the research proposal requirement.

• A copy of the research proposal developed in FOR 690 will be provided to the major professor and thesis committee upon completion for approval.

G. 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 investigation of the literature. It may involve a re-examination or re-evaluation of information generated by others to confirm or review their conclusions. It may also involve generating new knowledge through original research. 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 refereed research journal in the field. Graduate students in the School of Forestry are expected to prepare at least one draft manuscript suitable for publication before graduation.

Graduate students must ensure that their thesis meets general university requirements by working with the Graduate College's Format Editor. Theses in manuscript format are acceptable to the Graduate College and are endorsed by the Forestry faculty.

FORMAT OF A MANUSCRIPT THESIS

Theses in manuscript format should have all 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 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 thesis requirement.

A manuscript thesis must have:

- an overall preface that explains the structure and organization of the thesis. Some redundancy may exist in the thesis to maintain integrity of the individual manuscripts, but this should be kept to a minimum and mentioned in the preface.
- b) an introduction to the entire thesis (including a literature review if appropriate),
- c) individual chapters as manuscripts. A minimum of one data-driven research chapter is required. The major professor may also require a literature review chapter. Each data-driven chapter generally includes a title, abstract, introduction, materials and methods, results, discussion, and literature cited sections.
- d) a final chapter that discusses the management implications of the research.
- e) a literature cited section for each chapter of the thesis.

There may be slight variations in style between manuscripts reflecting different journal requirements. The non-manuscript portion of the thesis should have consistent style and the entire thesis must adhere to NAU formatting standards (https://nau.edu/graduate-college/thesis-and-dissertation/).

Below are guidelines for completing the thesis.

- The first draft of the thesis should be provided to the major professor at least eight weeks before graduation. If the student and major professor agree, review of individual chapters may occur during this time, rather than the complete thesis. The major professor must review the thesis and return to the student for revision; several cycles of review and revision are often required. The thesis should be submitted for format review by the Graduate College at this time but no later than 10 work days before the defense date.
- 2. The revised thesis should be submitted to the thesis committee at least six weeks before graduation or at least two weeks before the defense date. The committee should review the thesis within two weeks. If a committee member determines the thesis to be inadequate she or he may return it to the student with requested revisions. If a committee member feels the thesis is not defendable, the committee member should notify the major professor.
- 3. The final revised draft of the thesis should be submitted to the major professor at least four weeks before graduation or within one week following the thesis defense. 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 considered in the revisions. The major professor has final responsibility for thesis approval. Students should be aware that this is the minimum acceptable time for each review step.
- 4. NAU thesis formatting and submission is electronic. The thesis document must be submitted to the Graduate College (etd@nau.edu) for a format check early in the semester the student plans to defend but no later than 10 business days before the defense. The last possible date to submit the document for a format check is fifteen (15) business days before the end of the semester. See the Checklist for Proper Document Format for all items that need to be addressed and submitted for format checking: (http://www2.nau.edu/gradcol/ThesesDiss/ChecklistProperDocumentFormat.pdf).

The ETD coordinator will check the document for compliance with the format requirements outlined in the Checklist for Proper Document Format and will notify the student via NAU email regarding the results of the review and indicating any revisions that need to be made to the document.

- 5. Students must register for at least one credit of thesis (FOR699) for each fall and spring semester after the defense until final copies of the thesis are submitted to the Graduate College.
- 6. The final thesis should be submitted to the Graduate College at <u>etd@nau.edu</u> after

approval of any revisions required following the defense by the major professor and/or thesis committee members. The major professor will submit required documentation directly to the Graduate College upon thesis approval.

H. FINAL EXAMINATION

A final examination, or defense, of the thesis is required for all Master of Science candidates. The defense consists of two components: 1) presentation, and 2) oral examination.

- 1. The presentation component is open to all students, staff, and the public. In the presentation component the student orally presents an overview of the objectives, methods, results, and implications of the thesis research. Questions from the audience are permitted within the 60-minute maximum presentation period. Non-faculty must leave the examination following the presentation.
- 2. The oral examination will start about 15 minutes after the presentation. The examining committee must consist of at least the thesis committee. Faculty who are not on the thesis committee may attend the oral examination, but cannot vote on the student's performance. The major professor has the responsibility to ensure that the examination is conducted in a fair and appropriate manner. Questions will be limited to the thesis or general knowledge related to the thesis. Extended and detailed answers are expected from the student in response to questions. Oral examination questions should be designed to allow students to demonstrate their ability to integrate and apply information gained from coursework and the thesis research project.
 - 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 members of the student's thesis committee can vote whether to pass or fail the student. A passing vote by a 2/3 majority of the committee members is required to pass the defense. If a student fails the first defense, he or she will be given another opportunity to defend. The second defense should be scheduled to take place within six months of the first defense. Students will be notified immediately as to the outcome of the defense. The major professor is responsible for completing the "Final Oral Examination" form and collecting signatures. The form must be signed by all members of the thesis committee, the Graduate Coordinator, and the Executive Director of the School of Forestry.
 - Forms: "The Final Oral Examination (Thesis/Dissertation Defense) Part 1 (Pass/Fail Form)" form is used to record and document the vote of the thesis committee. This form is available to faculty at the following Graduate College website: https://nau.edu/graduate-college/forms/.
 - To account for the thesis committee to meet privately before and after the oral

examination, a period of 3 hours should be reserved for the oral examination.

- 3. The following rules apply to the final oral examination:
 - a. The examination must be announced to the faculty (via memo or email) at least one week in advance. The exam should also be announced to other appropriate departments. A copy of the thesis shall be available for inspection by all faculty one week in advance by putting one copy next to faculty mailboxes in the School of Forestry mailroom.
 - b. 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.

By no later than	Required activity or status:	
The end of the first semester	 Thesis committee formed and meets Program of Study and Foundation Course Plan (as needed) developed and approved by major professor and thesis committee 	
The end of the second semester of coursework	 Research proposal prepared and approved by major professor and thesis committee (FOR 690 taken) 	
The end of the next to last semester of coursework	 Apply for graduation 	
Beginning of final semester	Schedule 3-hour defense	
Eight weeks before graduation	Draft of thesis to major professor	
Three - six weeks before graduation	Revised draft of thesis to thesis committee	
Four weeks before graduation	Final revised draft of thesis to major professor	
Ten days before defense	 Thesis submitted to Graduate College for format review 	
One week before graduation	 Final copies of thesis submitted to Graduate College Final oral examination 	

I. RECOMMENDED TIMELINE FOR MASTER OF SCIENCE

Additionally: students and their advisors should complete graduate student evaluation form every semester or annually.

J. CHECKLIST FOR M.S. STUDENTS

The NAU Graduate College has prepared a checklist for M.S. students in thesis programs to follow to complete degree requirements. We recommend you download and periodically review this form to ensure you are on track for graduation: <u>https://nau.edu/graduate-college/forms/</u>.

CHAPTER 6 - MASTER OF FORESTRY (NON-THESIS OPTION)

This 33-hour program prepares you for a career in forest management, in contrast to a career in research. It is appropriate for students who desire advanced training in forestry, but not a research focus. Master of Forestry students can qualify for the WICHE WRGP program (see https://nau.edu/graduate-college/discount-tuition-rates/) which may allow funding for certain out-of-state students to earn their degree at the rate of 150% of the cost of in-state tuition.

The Master of Forestry program involves a minimum of 30 semester hours of coursework plus three hours of credit for the professional paper, plus any foundation coursework required as part of admission, and is designed by the student in consultation with the student's major professor, whose interests complement those of the student. The student's Program of Study includes core courses, as specified below, plus a selection of courses tailored to the student's personal interests. The development of both oral and written communications skills is an integral and essential part of the program.

The Master of Forestry degree includes the preparation and presentation of a professional paper, rather than a research thesis, on a subject relating to forest management. The successful completion of academic coursework and preparation of the professional paper leads to a Master of Forestry degree.

The Graduate Coordinator will recommend to the Executive Director of the School of Forestry one member of the School of Forestry tenure-track faculty or a Research Professor working full time in the School of Forestry to serve as the student's major professor. During the admission process, the Graduate Coordinator attempts to match the student's expressed interests with those of a faculty member. The student's major professor must have earned the degree that the student is seeking (e.g., a faculty member with an M.F. but no terminal degree can advise a student seeking an M.F.). However, if the major professor does not hold a Ph.D., the student must be co-advised with a School of Forestry faculty member who does.

A. PROGRAM OF STUDY

By the end of the first semester of coursework the major professor, in consultation with the student, must submit an approved "Program of Study" form (<u>https://nau.edu/graduate-college/programs-of-study/</u>) to the Graduate College. The Program of Study outlines a planned series of coursework and academic experiences for each student. It clearly specifies required courses. The Graduate Coordinator of the School of Forestry must approve the Program of Study, including any required revisions; the Executive Director also approves the final Program of Study submitted before graduation. Once a Program of Study has been approved, a student is expected to adhere to the Program.

The Program of Study Form, approved by the major professor, the Graduate Coordinator, and the Executive Director of the School of Forestry, must be submitted to the student's file in the office of School of Forestry, the major professor, and the Graduate Coordinator, and uploaded by the student to their LOUIE online account, no later than the end of the first semester of coursework after the student has been fully admitted. For students required to complete foundation courses, please see Chapter 4.

B. M.F. COURSEWORK REQUIREMENTS

The courses required for each graduate student are determined by the major professor in consultation with the student.

No foundation coursework may satisfy these requirements. The foundation course plan (<u>https://nau.edu/forestry/internal-resources/graduate-student-handbook/</u>) should be completed at the same time as the program of study (POS). Only the POS is uploaded to Louie; copies of the approved foundation plan are provided to the student, advisor(s) and placed in the official student file. Conditional admission status based on fulfilling foundation course requirements will not be removed until all foundation courses have been completed (or are in progress, if the final semester).

Required Courses (6 hours):

FOR 505	Forestry Seminar Series (1)
FOR 692	Proseminar (2) (recommend taking last semester of study)
STA 570	Statistical Analysis I (3), or one, three-credit hour graduate-level
	course with significant content in statistics (e.g., CCJ 614, SOC 655). FOR
	606 may be appropriate for students who have already completed a
	graduate-level course in statistics.

Core Courses (8-9 hours):

8-9 hours of core courses, with one course from each of the following subject areas: Ecosystem Science; Forest Management Sciences and Economics; and Forest Social Science. The list of courses satisfying these core areas can be found in Chapter 15, Table 1.

Courses offered as Special Studies in Forestry (FOR 506), Advanced Studies in Forestry (FOR 695), special topics courses, or other courses offered by the School of Forestry or other departments that are clearly related to the subject areas can be used as core courses with approval by the major professor.

Elective Courses (15-16 hours):

You must take 15-16 hours of electives, chosen in consultation with your major professor.

Professional Paper (3 hours):

FOR 689 Professional Paper (3) (typically taken in last semester of study)

TOTAL REQUIRED: 33 hours

The following rules for all master's degrees at NAU should be followed:

- 1. Each 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.
- 2. Only six semester hours of graduate coursework with a grade of "C" are acceptable.
 - a. A student with more than 6 units of graduate course work with a grade of "C" or below cannot continue in a master's program, regardless of GPA. Graduate students do not normally repeat courses. But, if a grade of "D" or "F" is received in a graduate course, students may repeat that course, with advisor approval. The repeated course does not replace the grade for the prior course; if a course is repeated, both grades are used in the computation of the overall grade-point average (GPA). Units earned for repeated courses may only be used once to fulfill graduation requirements.
- 3. No graduate credit is allowed for courses numbered 100-399.
- 4. With the approval of the student's major professor, up to two 400-level courses taken at NAU may be used on a master's degree program (requires filing of the "Override Authorization-Audit/Class Links/Out of Career" form, available from the Registrar's website: <u>http://nau.edu/Registrar/Forms-and-Policies/#General</u>).
- 5. You must complete at least 24 hours of formal coursework i.e., courses other than such individualized studies as independent studies, directed readings, and research.
- 6. Contingent on approval of the major professor, up to 25% of the credits required for the M.F. degree may be transferred to NAU from another graduate institution. Transfer courses used to meet degree requirements must be submitted to the Graduate College using the online "Petition for Transfer Credit" form: https://nau.edu/graduate-college/forms/. The Graduate College must approve all use of transfer courses to meet degree requirements. Transfer courses older than 6 years must be approved by the Graduate College using the "Petition for Extension of Time Limit" form for Master's students available at: https://nau.edu/graduate-college/forms/.
- 7. Graduate students working on a professional paper are expected to enroll in FOR 689 (Professional Paper) each semester from the semester of first enrollment in FOR 689 until completion of the degree. Most students will enroll in three credits of FOR 689 in

their last semester. A maximum of 4 credits total is allowed for FOR689. Failure to complete FOR 689 in that semester requires enrollment for at least one credit in the next semester. If you do not maintain continuous enrollment after you have begun work on your professional paper and you do not have an approved leave of absence on file with the Graduate College and wish to resume work, you must submit a new application for admission and register for additional credits of Professional Paper (FOR 689) in an amount equal to the number of such credits missed while not maintaining continuous enrollment.

8. Read and follow the guidelines and procedures for NAU master's programs described by the Graduate College at: <u>https://nau.edu/graduate-college/thesis-and-dissertation/</u>.

C. COURSE LOADS

For graduate students, 9 credit hours during fall and spring semesters are considered to be fulltime 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).

D. THE PROFESSIONAL PAPER

Each student will prepare a professional paper (FOR 689 Professional Paper) under the guidance of the major professor. The professional paper will serve as a capstone exercise that will help students integrate knowledge and information from courses and other information to produce new insights on forest management. The professional paper will serve as the written comprehensive exam required under the "Comprehensive Examination Plan" for master's degrees at NAU.

1. REQUIREMENTS OF THE PROFESSIONAL PAPER

- a. The final product must be a manuscript of length appropriate for submission to a professional journal, and judged by the major professor and the graders of the paper to represent "publishable quality" with respect to a relevant refereed journal. Actual publication, with the major professor as co-author as appropriate, is encouraged but not required. The paper should include a title page that includes the names of the author and the graders of the paper, and the year that the paper was completed.
- b. The paper should have a forest management orientation. It may address a specific forest management problem, or it might have a more philosophical or theoretical orientation. Examples of professional paper topics include the following:
- an article describing the forest management philosophy and practices of Native Americans;
- a literature review relating to specific forest management policies or activities of

an agency such as the USDA Forest Service;

- an analysis of the potential application of forest 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 forest management problems;
- an analysis of potential local, regional, national, or international economic impacts associated with forest management as compared to commodityoriented management;
- an analysis of a complex local, regional, national, or international natural resources problem that has implications for forest management;
- a compilation of background material that might form the basis for a research proposal relating to forest management;
- results of pilot studies or establishment of research methodologies for future analysis.
- c. The paper should have a distinct section that demonstrates the author's competency in the following learning outcome of the Master of Forestry: "An understanding of professional ethics, particularly the ability to examine how ethical issues frame decisions concerning the management of forested land." To do this, the section should first articulate the author's professional code of ethics, including their foundations and sources (e.g., professional societies, philosophy, religion). Second, the section should interpret the paper's recommendations and conclusions in the context of the author's professional ethics.

2. IDENTIFYING THE TOPIC FOR THE PROFESSIONAL PAPER

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. The student should consult the major professor regularly during the preparation of the professional paper.

3. COMPLETING THE PROFESSIONAL PAPER

Prior to the student's last semester, the major professor, in collaboration with the student, will recruit at least two other faculty or resource professionals to serve as graders of the professional paper.

a. At least one grader must be faculty in the School of Forestry, and at least two graders must be faculty or adjunct faculty at NAU. If desired, one grader may be

a non-faculty professional working in forestry or a related discipline.

- b. The graders, including the major professor, will critique and approve an outline and scope of the professional paper within the first two weeks of the student's enrollment in FOR 689, and review and approve the paper, which is due the last day of class in the semester of student enrollment in FOR 689. If the student is co-advised, then only one additional reader is needed.
- c. A 2/3 vote of approval on a pass/fail basis by the grading committee is required for the student to pass FOR 689. The major professor will complete the form "Non-Thesis Master's Degree, Report on Final Oral Examination," available from the Graduate College at <u>https://nau.edu/graduate-college/wpcontent/uploads/sites/14/Report_FinalOralExam_NonThesis.pdf</u> and will submit a fully signed copy to the School of Forestry.
- d. The student must submit an electronic copy of the professional paper to the School of Forestry by emailing it to <u>ForestryGraduateStudies@nau.edu</u>. On the Graduate Application Form (<u>http://nau.edu/GradCol/Student-</u><u>Resources/Graduation/</u>), check the 'No' box for oral and written defense required.

4. PRESENTING THE PROFESSIONAL PAPER

A final presentation of the professional paper is required of all Master of Forestry students. The presentation is open to all students, staff, and the public.

- a. In the presentation the student will present an overview of their professional paper (approximately 40-45 minutes) and allow 15-20 minutes for questions from the audience.
- b. The professional paper should be presented no later than the last day of classes during an academic semester.
- c. One copy of the professional paper should be provided to the readers and placed in the School of Forestry mailroom at least one week before the final presentation to allow review by faculty, staff, and other students.
- d. There is no Oral Exam/Defense required for this degree.
- e. A PDF file of the final approved copy of the MF paper will be submitted to the Graduate Coordinator of the School of Forestry. The paper will be archived on the School of Forestry website.

E. MASTER OF FORESTRY, ACCELERATED BACHELOR'S/MASTER'S OPTION

The objective of the accelerated program is to facilitate faster completion of the Master of Forestry degree by outstanding and highly motivated students in the Bachelor of Science in forestry at NAU. Accelerated programs provide the opportunity for outstanding undergraduates working on their bachelor's degree to simultaneously begin work on a master's degree, which may allow them to complete both degrees in an accelerated manner:

• 12 units may be applied toward both degrees (6 units 400-level, 6 units 500- or 600-level; all 12 units must be FOR courses or courses used in an emphasis area in the

bachelor's degree in forestry).

- Students must apply to the Accelerated Bachelor's/Master's Program during the third semester of professional program coursework, by the fall application deadline, and meet all requirements to be considered for admission.
- Students in the Bachelor of Science, Forestry Program at NAU must meet the following requirements for acceptance into the Accelerated Bachelor's/Master's option of the Master of Forestry:
 - a) 3.25 GPA overall college and university courses
 - b) 3.5 or higher GPA in the following FOR required courses: FOR 211, FOR 213, FOR 215, FOR 313, FOR 315, FOR 319, FOR 320, FOR 321.
 - c) Enrolled in the Bachelor's of Science, Forestry Program at NAU

F. SUMMARY OF IMPORTANT DEADLINES FOR THE MASTER OF FORESTRY

By no later than	Required activity or status:		
The end of the first semester	 Program of Study and Foundation Course Plan (as needed) developed and approved by major professor the general topic the student will address in the professional paper. 		
The end of the second semester of coursework	 Apply for graduation 		
Beginning of the final semester of coursework	 Graders are arranged for the professional paper, FOR 689 		
Four-Six weeks before the end of the semester	 Student submits a draft of the professional paper to the major professor. 		
Two weeks before the professional paper presentation Before the last day of classes	 Major professor sends the revised draft of the professional paper to grading committee. Professional paper presentation. 		

Additionally: students and their advisors should complete graduate student evaluation form every semester or annually.

CHAPTER 7 - DOCTOR OF PHILOSOPHY IN FORESTRY

A. 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, 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 four Ph.D. emphasis areas: Ecosystem Science, Forest Management Sciences and Economics, Forest Social Science, and Ecology, Evolution and Conservation Biology (EECB). The EECB emphasis is available as a secondary emphasis for interested students and partially met through the elective coursework requirement.

B. DISSERTATION COMMITTEE ESTABLISHMENT

The Graduate Coordinator will recommend to the Executive Director of the School of Forestry one full time faculty member in the School of Forestry to serve as the student's major professor. The major professor must have completed a doctoral degree to advise a Ph.D. student.

- 1. The major professor, in conjunction with the student, will recommend members of the dissertation committee to the Graduate Coordinator using the form available at http://www2.nau.edu/gradcol/ThesesDiss/Dissertation_Committee_Rec.docx.
- 2. The dissertation committee should be formed by the end of the student's second semester in the doctoral program.
- 3. Foundation course requirements should be documented by the "Foundation Course Plan" form (available in the appendix of this document).
- 4. Dissertation committees include at least four members who have earned doctorate degrees and have expertise relevant to the dissertation. In rare circumstances and with approval from the Graduate College, a committee member with a master's degree and relevant expertise unique to the project may be considered.
- 5. In addition to the major professor, at least one member of the dissertation committee must be faculty, adjunct faculty, or research faculty in the School of

Forestry.

- 6. Dissertation committees must include a member who is outside the School of Forestry. This outside-department member of the committee may be faculty, adjunct faculty, or research faculty at NAU or at other colleges and universities, but also may include non-university scientists and specialists, such as researchers with governmental agencies or non-governmental organizations.
- 7. Additional members of the dissertation committee typically are faculty, adjunct faculty, or research faculty at NAU or at other colleges and universities, but also may include non-university scientists and specialists, such as researchers with governmental agencies or non-governmental organizations.
- Participation on a dissertation committee by a person who is not faculty, adjunct faculty, or research faculty at NAU must be approved by the Graduate College using the "Recommendation of Dissertation Committee" form available at <u>http://nau.edu/GradCol/Student-Resources/Theses-and-Dissertations/</u>, which requires attachment of the committee member's vita.
- 9. Adjunct faculty may serve as members of the dissertation committee, but not as the major professor.
- 10. The student's major professor is responsible for submitting to the Graduate College the "Recommendation of Dissertation Committee" form available at http://nau.edu/GradCol/Student-Resources/Theses-and-Dissertations/.
- 11. Once a dissertation committee has been established, faculty who retire may continue to serve on the dissertation committee. The dissertation committee shall be established within the first semester that a student begins coursework.
- 12. The dissertation committee's assessment of the student's progress towards meeting degree requirements will be summarized on the "Ph.D. Student Progress Evaluation" form (available in the appendix of this document or at http://nau.edu/GradCol/Student-Resources/Theses-and-Dissertations/), which shall be completed each year. Copies of the form shall be given to the student and placed in the student's departmental file.

C. Ph.D. COURSEWORK - GENERAL RULES

The major professor and the dissertation committee in consultation with the student shall determine the required courses.

The following rules should be considered:

1. All graduate students must maintain a GPA of 3.0 or higher. Only six hours of grade

"C" are acceptable in the Ph.D. degree program. The student must receive a "B" or better in the fifteen credit hours selected in the emphasis area. A student with more than 6 units of graduate course work with a grade of "C" or below cannot continue in a Ph.D. program, regardless of GPA. Graduate students do not normally repeat courses. But, if a grade of "D" or "F" is received in a graduate course, students may repeat that course, with advisor approval. The repeated course does not replace the grade for the prior course; if a course is repeated, both grades are used in the computation of the overall grade-point average (GPA). Units earned for repeated courses may only be used once to fulfill graduation requirements.

- 2. No graduate credit is allowed for courses numbered 100-399.
- 3. Up to nine hours of 400- level courses from NAU may be used on a Ph.D. degree program with the approval of the dissertation committee (requires filing of the "Override Authorization-Audit/Class Links/Out of Career" form, available from the Registrar's website: <u>http://nau.edu/Registrar/Forms-and-Policies/</u>).
- 4. 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 nine hours/semester. Graduate assistants must be full-time graduate students (9-12 hours/semester) except as noted under the credit load section.
- Graduate students working on a dissertation are expected to enroll in FOR 799 (Dissertation) each semester from the semester of first enrollment in FOR 799 until completion of the degree.
 - a) You must register in FOR 799 for a minimum of one credit each fall and spring semester. If you are using research or other university facilities, and/or the professional time of faculty members, you should enroll for at least three credits.
 - b) During the term you complete and defend your dissertation, you must enroll for at least one credit.
 - c) If you do not maintain continuous enrollment after you have begun work on your dissertation and you do not have an approved leave of absence on file with the Graduate College and wish to resume work, you must submit a new application for admission and register for additional credits of Dissertation (FOR 799) in an amount equal to the number of such credits missed while not maintaining continuous enrollment.
- 6. 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.
- a) A maximum of 24 credit hours of graduate-level coursework completed during a master's degree can be used to meet degree requirements.
- b) Students must take at least two of the five emphasis area courses at NAU (see below), and obtain approval from the dissertation committee for any courses taken elsewhere.
- c) Transfer courses used to meet degree requirements must be submitted to the Graduate College using the online "Petition for Transfer Credit" form: <u>https://nau.edu/graduate-college/forms/</u>. The Graduate College must approve all use of transfer courses to meet degree requirements.
- d) Transfer courses older than 6 years must be approved by the Graduate College using the "Petition for Extension of Time Limit" form for doctoral students available at: <u>http://nau.edu/GradCol/Policies-and-Forms/Forms/</u>.
- 7. 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.
- 8. Read and follow the guidelines and procedures for NAU doctoral programs described by the Graduate College at: <u>http://nau.edu/GradCol/Student-Resources/</u>.
 - a) The 'Checklist for Doctoral Students Dissertation Programs' should be reviewed and utilized on a regular basis.

D. Ph.D. COURSEWORK – REQUIREMENTS

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

- 1. A minimum of 15 dissertation credit hours is required.
- 2. A minimum of 48 credit hours of coursework (beyond the bachelor's degree) that includes:
 - a) A minimum of 39 credit hours of 500-600 level courses;
 - b) A maximum of nine credit hours of 400-level courses, subject to committee approval;
 - c) A maximum of 24 credit hours of coursework completed during a master's degree, which may be credited to the 48 credit hour requirement.
 - d) No foundation coursework or dissertation hours (FOR 799) may satisfy the 48

credit hour requirement. The foundation course plan

(https://nau.edu/forestry/internal-resources/graduate-student-handbook/) should be completed at the same time as the program of study (POS). Only the POS is uploaded to Louie; copies of the approved foundation plan are provided to the student, advisor(s) and placed in the official student file. Conditional admission status based on fulfilling foundation course requirements will not be removed until all foundation courses have been completed (or are in progress, if the final semester).

- 3. All doctoral students must take the following 14 hours:
 - a) FOR 505 Forestry Seminar Series (1 hour): Students must take FOR 505 at least at once during their degree program. The course may be taken up to five times during the degree program.
 - b) FOR 690 Research Methods (3 hours), or another graduate-level course with three-credit-hours of content in defining, organizing, conducting, and evaluating scientific research, the philosophy of science, and the preparation and review of research proposals.
 - c) FOR 692 Proseminar I (2 hours)
 - Doctoral students (not M.S. or M.F. students) may earn credit for FOR 692 based on demonstration of proficiency in preparing and presenting scientific talks and posters. This way of earning credit for Proseminar requires course registration in FOR 692.
 - Proficiency will be shown within the first year of enrollment by presentation of a departmental seminar based on previous or current research, and a public presentation of a poster, based on previous research, in the Forestry Building. The seminar and poster will be evaluated by the student's major professor and FOR 692 instructors to assess whether the presentations meet requirements for passing FOR 692. If the requirements are not met, the student must re-enroll in FOR 692 and complete all course requirements.
 - ii. Graduate-level courses transferred from other universities or taken at NAU with two credit hours of content in the preparation and presentation of scientific talks and posters may be used to meet the requirement for FOR 692, contingent on approval by the dissertation committee and Graduate Coordinator.
 - d) FOR 693 Teaching Practicum (2 hours)
 - e) Six hours of graduate-level (500-, 600-, 700-) courses with significant content in statistics. Examples include:

- FOR 606 Applied Ecological Data Analysis (3)
- STA 570 Statistical Methods I (3)
- STA 571 Statistical Methods II (3)
- STA 572 Multivariate Statistical Methods (3)
- STA 574 Categorical Data Analysis (3)
- STA 676 Experimental Design (3)
- CCJ 614 Research Statistics (3) OR SOC 655 Quantitative Analysis (3)
- BIO 682 Quantitative Biology (3)
- Other graduate-level courses with significant content in statistics.

Note that STA 570 is a prerequisite for all other 500-level STA courses.

- 4. You must also take 15 hours in your emphasis. Students must take at least two of these courses at NAU and obtain approval from the dissertation committee for any courses taken elsewhere.
 - a) Courses offered as Special Studies in Forestry (FOR 506, 599), Advanced Studies in Forestry (FOR 695), or special topics courses offered by other departments can be used to fulfill emphasis requirements, with approval by the dissertation committee. When faculty offer a FOR 506, 599, or 695 course, they should work with the Graduate Coordinator to determine the appropriate emphasis area the course satisfies.
- 5. You must also take 19 hours of electives.
 - a) The elective coursework requirement can be partially met (13 of the required 19 hours) by completing the Ecology, Evolution, and Conservation Biology (EECB) Emphasis, which requires completion of 3 credit hours of BIO 577/FOR 577 (Concepts in Ecology), 1 credit hour of a seminar course (FOR 505 or BIO 698), and 9 credit hours of graduate-level courses selected from each of the following groups: quantitative, physiological/population/community, and ecosystem/global.
 - i. Courses available for these groups are listed in Chapter 15, Table 1, and the NAU catalog description for the degree.

E. 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 (https://nau.edu/graduate-college/programs-of-study/). The dissertation committee, Graduate Coordinator, and Executive Director of the School of Forestry must approve the Program of Study, including any required revisions. Once a Program of Study has been approved, a student is expected to adhere to the Program.

The Program of Study Form, including any revised Programs of Study, must be copied to the

Graduate Coordinator, the graduate student's file in the School of Forestry office, the major professor, all members of the student's dissertation committee, and the Graduate College.

F. COURSE LOADS

Nine credit hours during each of the fall and spring semesters are considered to be the minimum course load for full-time enrollment for graduate students. Sixteen hours per semester is the maximum (12 hours for graduate assistants).

After completion of all required course work except dissertation, a resident doctoral student on half-time assistantship may petition to register for six credit hours a semester. Such a petition should be approved by the Graduate College and be endorsed by the student's major professor and the Executive Director of the School of Forestry.

G. SEMINAR REQUIREMENTS

- 1. All Ph.D. students are encouraged to attend the School of Forestry seminar series, unless course or research schedules interfere.
- 2. In addition, all Ph.D. students are required to present two seminars: 1) presentation of final research results in a dissertation defense seminar; and 2) presentation of a talk or poster 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).
 - a) The second seminar must be presented outside the School seminar series and is subject to approval by the student's major professor.

H. RESEARCH COMPETENCY REQUIREMENT

NAU policy for Ph.D. programs includes a "research competency requirement" that must be satisfied before a student can be admitted to candidacy. In the School of Forestry, FOR690 (Research Methods) plus two graduate-level courses (six hours) with significant content in statistics, meet this requirement.

I. RESEARCH REQUIREMENTS

The Ph.D. degree requires a demonstration of considerable independence, research skill, and experience in a discipline within forestry.

- 1. Development of techniques, design of experiments, collection and analysis of data, reporting results in written and oral forms, and preparation of research proposals are skills that should be mastered in this degree program.
- 2. The choice of a problem and research area is made in consultation with the dissertation committee.
- 3. Dissertation research meets School of Forestry standards when it poses a set of

objectives which: 1) are based in the theoretical context of the subject, 2) proceed with a sound design that gives due attention to statistical adequacy, and 3) concludes with findings and inferences that once again are set forth in an appropriate theoretical context.

- 4. The dissertation must demonstrate that the student has mastered their field of specialization, has carried out independent scholarly work, and has contributed significant new knowledge.
- 5. The student must prepare a research prospectus that outlines the general research area and identifies the research questions to be answered in their research. The proposal / prospectus should include a working title for the thesis, a statement of research questions or objectives, a literature review related to the research topic, and a brief summary of the proposed research methods or approach.
 - a) The research prospectus is generally 5-10 pages in length and must be approved by the dissertation committee. A copy is placed in the School file, and a copy is included as part of the "Dissertation Committee Recommendation" form (http://nau.edu/GradCol/Student-Resources/Theses-and-Dissertations/).

J. 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 take place after the student has met all coursework requirements, as directed by the student's Program of Study. Comprehensive examinations must occur no later than one semester before graduation; ideally, students complete them in the third year.

COMPREHENSIVE WRITTEN EXAMINATION

Each student must successfully complete a written comprehensive examination. This examination is separate from the student's coursework requirements. With the approval of the dissertation committee, the student may choose among 3 options for the format of the written examination.

Option 1: Timed, written response to questions: 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 one or more questions. A student will have a maximum of eight hours to prepare a response to the line of questioning provided by each member of the dissertation committee (i.e., 8 hours for each committee member's line of questioning). The exact format for preparing responses for a line of questioning is at the discretion of the faculty member preparing the line of questioning, with the approval of the major professor.

General schedule and responsibilities:

- The choice of the written exam format is made jointly by the student and the committee. At any time after the dissertation committee is formed, the student may propose their preferred written exam option to the committee, solicit feedback, and obtain committee approval of the choice.
- Student works with major professor and Dissertation Committee to determine a week to complete the written comprehensive examination.
- Student and major professor determine which weekdays the written questions will be disseminated, start and end time each day, daily order of dissertation committee questions and whether a lunch break will be included.
 - Example schedule: Day 1: 8:00am 4:30pm (30-minute lunch break included);
 committee member 1 questions Day 2: same, but committee member 2 questions, etc.
- Major professor is responsible for disseminating and collecting questions at the beginning and end of each day and passing each question along to the appropriate committee member for grading.

The major professor must read and evaluate all responses. Only the committee member responsible for a particular line of questioning is required to 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 committee members, 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. A student may either pass or fail the examination. A student passes the examination by preparing adequate responses to 3/4 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 can 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.

Option 2: Publication-quality literature review paper: The examination will consist of the preparation of a publication-quality literature review paper. Students would select a topic within their field of study, or another topic within the field of forestry to develop a comprehensive review paper that synthesizes the state of knowledge. The literature review will be judged by the committee as to whether it is of sufficient quality to be publishable, using their professional judgement. The best reviews will be those that develop novel synthetic insights or new directions for the field. The review should be distinct from other published reviews.

General schedule and responsibilities:

- The choice of the written exam format is made jointly by the student and the committee. At any time after the dissertation committee is formed, the student may propose their preferred written exam option to the committee, solicit feedback, and obtain committee approval of the choice.
- Student may begin development and writing at any point in their program after the selection of the literature review option. The major professor will, and committee members may, provide feedback on drafts, but the student remains the sole author at least until the exam is passed.
- Student and major professor, in consultation with the committee, determine a date for the review to be disseminated to committee members for assessment.
- Upon receipt, major professor and other committee members have 14 days to read and assess the review, determining if it is of publication quality in their professional opinion (this equals a "pass" vote), and if not, providing constructive critique to the student that would elevate the review to that standard.
- If appropriate, a version of this review may later be included as part of the dissertation (e.g., as the introductory chapter), but cannot replace a chapter derived from the dissertation research. The dissertation must be satisfactory with or without this review.

A student passes the examination when at least 3/4 of the committee members vote "pass", indicating that the review is of publication quality. Upon passing the written examination the student becomes immediately eligible for the oral comprehensive examination. Failure results when two or more committee members feel that the student has not prepared a publication quality review. In this case, the student can resubmit one revision of the literature review to those committee members, taking into account their constructive criticism, on a mutually agreed date after which those committee members would have 14 days to reassess and communicate their decision to the major professor.

Option 3: Original grant proposal: The examination will consist of the preparation of an original research proposal on a topic within the student's field of study, or another topic within the field of forestry. The proposal must identify significant knowledge gaps and propose an approach to fill the knowledge gap with original research. The grant proposal will be judged by the committee as to whether it is of sufficient quality to be competitive for funding, using their professional judgement. The proposal should reflect a **new idea attributable to the student**, rather than the student's advisor. Students would be encouraged to develop proposals oriented toward dissertation improvement - going beyond the student's original dissertation plan - or potential post-doctoral research.

General schedule and responsibilities:

- The choice of the written exam format is made jointly by the student and the committee. At any time after the dissertation committee is formed, the student may propose their preferred written exam option to the committee, solicit feedback, and obtain committee approval of the choice.
- Student may begin development and writing at any point in their program after the selection of the proposal option. Student and major professor choose an appropriate format for the proposal, based on one used by a funding agency. The major professor will, and committee

members may, provide feedback on drafts, but the student remains the sole author at least until the exam is passed.

- Student and major professor, in consultation with the committee, determine a date for the proposal to be disseminated to committee members for assessment.
- Upon receipt, major professor and other committee members have 14 days to read and assess the proposal, determining if it is of sufficient quality to be competitive in their professional opinion (this equals a "pass" vote), and if not, providing constructive critique to the student that would elevate the proposal to that standard.

A student passes the examination when at least 3/4 of the committee members vote "pass", indicating that the proposal is of sufficient quality to be competitive for funding. Upon passing the written examination the student becomes immediately eligible for the oral comprehensive examination. Failure results when two or more committee members feel that the student has not prepared a competitive proposal. In this case, the student can resubmit one revision of the proposal to those committee members, taking into account their constructive criticism, on a mutually agreed date after which those committee members would have 14 days to reassess and communicate their decision to the major professor.

Regardless of the option, a student has only one opportunity to retake/resubmit any or all portions 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 one year (two 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 College on the "Report of Results of 39 Written Comprehensive Examination" form (Appendix, or http://nau.edu/CEFNS/Forestry/Student-Resources/Graduate-Handbook/).

2. COMPREHENSIVE ORAL EXAMINATION The comprehensive oral examination can only be scheduled after the successful completion of the written examination. A minimum of 2 weeks should be planned between the written and oral comprehensive examinations. All dissertation committee members must attend the oral examination. The examination should focus on a mixture of subjects within the student's subfield(s), and other topics within or related to the broader field of forestry and agreed upon by the committee. The examination may include a presentation by the student on the student's research plan and preliminary results. Generally, the oral examination should continue for two hours. At the end of the discussions, the student will be asked to leave the room so that the members of the dissertation committee can discuss the student's performance. The major professor must inform the student as to the oral examination. A vote of 3/4 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 one year (two 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 to the Graduate College on the "Report of Results of Oral Comprehensive Examination" form (Appendix, or http://nau.edu/CEFNS/Forestry/Student-Resources/Graduate-Handbook/)

K. ADMISSION TO CANDIDACY

A student must apply for candidacy on the form "Application for Candidacy for the Doctoral Degree" (http://nau.edu/GradCol/Student-Resources/Theses-and-Dissertations/). The application is approved by the major professor, the Executive Director of the School of Forestry, and the Dean of the Graduate College.

Admission to candidacy should be obtained during the semester before graduation and must be granted at least 90 days before the Dissertation Defense Examination.

Application for Candidacy of the Doctoral Degree Checklist

- Submit the Recommendation of Dissertation Committee paperwork with a 2-3 paragraph summary of your dissertation. This form can be found on the Graduate College webpage at <u>http://nau.edu/GradCol/Student-Resources/Theses-and-Dissertations/</u>.
- Submit the Report on Results of Written Comprehensive Examination and Report on Results of Oral Comprehensive Examination after you have completed your comprehensive exams. These forms can be found on the School of Forestry webpage at <u>http://nau.edu/CEFNS/Forestry/Student-Resources/Graduate-Handbook/</u>.
- 3. Submit your dissertation prospectus. Your prospectus consists of the following two items:
 - a) A 5-10 page research prospectus which has been approved by your dissertation committee.
 - b) A copy of your prospectus title page that has been signed by your committee.
- 4. Complete and submit your candidacy application. This application is located at <u>http://nau.edu/GradCol/Student-Resources/Theses-and-Dissertations</u>. Make sure you can answer 'yes' to the following questions before submitting your candidacy paperwork:
 - a) Have you completed all your coursework except for dissertation credits?
 - b) Have you met the research competency requirement (completed FOR 690 and two courses (six hours) with a significant content in statistics)?

- c) Have you met the residency requirements (residency is defined as carrying a minimum load of nine credit hours of committee-approved courses during a semester or five approved hours during a summer session)?
- d) Is your Program of Study current? If your coursework has changed, you will also need to submit an updated Program of Study with your candidacy application.

All paperwork should be turned in to the School of Forestry once you have obtained the necessary signatures. The School of Forestry Office will then distribute copies of your paperwork and ensure that a copy goes in our files and the Graduate College's files.

L. DISSERTATION REQUIREMENTS

The School of Forestry has adopted Manuscript Dissertations: a series of manuscripts either submitted, or prepared for submission, to professional refereed journals, with additional introductory and concluding chapters in the Graduate College-approved format. Detailed format requirements are specified by the Graduate College at the following webpage: http://nau.edu/GradCol/Student-Resources/Theses-and-Dissertations/. The student is expected to conform to the style of presentation currently accepted by the Graduate College in preparing all drafts of a dissertation.

Manuscript Dissertations

Dissertations in manuscript format include 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. There may 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 review the format guidelines (see link above) well in advance of preparing their dissertation.

- 1. Requirements of a manuscript dissertation:
 - a) An introduction to the entire dissertation (including a literature review if appropriate), and then is divided into chapters or manuscripts.
 - b) Each chapter generally has a title, abstract, introduction, materials and methods, results, discussion, and literature cited section.
 - c) The dissertation should have an overall preface that explains the structure and organization of the dissertation.
 - d) Following the individual manuscript chapter(s) there is an overall summary of the entire dissertation project, including management implications.
 - e) Some redundancy may exist in the dissertation to maintain integrity of the individual manuscripts, but this should be kept to a minimum.
 - f) A dissertation will generally include at least 3 manuscript chapters, for a total of 5 chapters (introduction, 3 data-driven manuscript chapters, management implications). In special cases, with the approval of the dissertation chair and committee, fewer chapters will be considered acceptable (e.g., the student is preparing a monograph, rather than multiple journal articles).

Guidelines for completing the dissertation:

- 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 before distribution to the dissertation committee. This initial review should be made well in advance of the dissertation defense examination and often requires several cycles (minimum of eight weeks). At this time students should submit their dissertation to the Graduate College for format review. Committee members must be given the opportunity to review the manuscripts prior to submissionfor publication when this occurs prior to the defense date.
- 2. The revised dissertation should be submitted to the dissertation committee at least four weeks before dissertation defense examination. Committee members must provide feedback on the dissertation within two 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 College at least two weeks before the date of the dissertation defense exam.
- 4. Students should be aware that this is the minimum acceptable time for each review step. The Graduate College estimates the average time required to complete the dissertation is three months following approval of the format by the Graduate College. Consequently, students are advised to arrange their first format review with the Graduate College Format Editor in the first two weeks of the semester they plan to complete the thesis.
- 5. NAU dissertation formatting and submission is electronic. The dissertation document must be submitted to the Graduate College for a format check early in the semester the student plans to defend but no later than ten business days before the defense. See the Checklist for Proper Document Format for all items that need to be addressed before submission. Also helpful might be the Thesis Title Page Model or the Dissertation Title Page Model. Visit <u>http://nau.edu/GradCol/Student-Resources/Theses-and-Dissertations/</u> for more information.
- 6. Submit an electronic copy of the following items to the Graduate College ETD coordinator (etd@nau.edu) for format review:

a. Title Pageb. Abstractc. Dissertation (completed document)

The ETD coordinator will check the document for compliance with the format

requirements outlined in the Checklist for Proper Document Format and will notify the student via NAU email regarding the results of the review and indicating any revisions that need to be made to the document.

7. Students must register for at least one credit of dissertation (FOR799) for each semester after the defense until final copies of the dissertation are submitted to the Graduate College, including summer semester.

M. DISSERTATION DEFENSE

A defense of the dissertation is required for all Ph.D. candidates.

Defense requirements and guidelines:

- 1. The dissertation defense shall be held within four years of the oral comprehensive exam. If this time is longer than four years, the oral exam must be repeated.
- 2. The dissertation defense must occur no sooner than 90 days following admission to candidacy.
- 3. The defense should be scheduled at least four weeks before the expected date of graduation.
- 4. The student must complete the "Dissertation Defense Scheduling" form on the Graduate School webpage (<u>http://nau.edu/GradCol/Student-Resources/Theses-and-Dissertations/</u>) and send it to the Graduate College to schedule the defense, at least 10 business days before the defense.
- 5. The defense will be scheduled immediately following the dissertation defense seminar. The dissertation defense seminar is open to the public.
- 6. The length of the dissertation defense seminar will be limited to 60 minutes, including questions from the audience.
- 7. The dissertation defense will convene within 20 minutes following the seminar.
- 8. 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 College. The observer reports to the Graduate College 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.
- 9. The maximum time for the dissertation defense (following the seminar) is two hours.
- 10. At least four weeks of notice of the defense should be provided to all dissertation

committee members.

- 11. All committee members also should be provided a copy of the dissertation for review at least four weeks before the defense.
- 12. The dissertation must be in final form before 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.
- 13. 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.
- 14. 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 3/4 majority of the committee members is required to pass the defense.
 - a) If a student fails their first defense, they will be given another opportunity to defend. The second defense must be scheduled to take place within six months of the first defense.
- 15. Students will be notified immediately as to the outcome of the defense.
- 16. **Forms:** The University Graduate Committee representative provides the "Final Oral Examination (Thesis/Dissertation Defense) Part 1 (Pass/Fail)" form on which the vote is recorded and which the committee members sign.

N. STUDENT TEACHING REQUIREMENT

All Ph.D. students benefit by gaining 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, and competency in teaching.

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 a minimum of four 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 (Appendix, or http://nau.edu/CEFNS/Forestry/Student-Resources/Graduate-Handbook/).

- 1. 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.
- 2. Teaching in a class by a student does not replace the requirement to take FOR 693 (Teaching Practicum), which is a required course for the Ph.D. degree in the School of Forestry.

O. RESIDENCY REQUIREMENTS

The student must spend two 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 nine credit hours of committee-approved courses during a semester or five approved hours during a summer session.

P. SUMMARY OF IMPORTANT DEADLINES FOR THE Ph.D.

No later than	Complete task						
• End of 2 nd semester	 Form dissertation committee and submit form to Grad College for approval Write prospectus and complete Program of Study Complete Foundation Course Plan if required 						
Upon completion of coursework	Comprehensive exams						
Semester before graduation	Apply for candidacy						
Semester before graduation	 Apply for graduation 						
Ten days before defense	Submit defense scheduling formSubmit dissertation for format check						
Last day of term	 Submit approved, final dissertation to ProQuest 						

Additionally: students and their advisors should complete graduate student evaluation form every semester or annually.

CHAPTER 8 - APPLICATION FOR GRADUATION

All graduate students in the M.F., M.S., and Ph.D. programs must make a formal application for graduation. A student should apply for graduation in the semester before the semester in which graduation is expected. Forms and information on deadlines are available in the Registrar's Office and the Graduate College (http://nau.edu/GradCol/Student-Resources//Graduation/). The application process includes payment of a graduation fee. The Program of Study must be current and the final, updated form should be submitted before applying for graduation.

In signing the application, the major professor asserts that the graduate student is making sufficient progress to be able to complete and defend the professional paper, thesis, or dissertation before the end of the semester.

CHAPTER 9 - FINANCIAL ASSISTANCE

There are four broad categories of financial support available to students in the School of Forestry. The first and most common is a research assistantship awarded by the School of Forestry based on academic merit and ability to conduct research in collaboration with a faculty member. The second, a teaching assistantship, is occasionally available depending on funding and teaching needs of the School. Teaching assistantships are awarded by the Executive Director of the School of Forestry. Both Research and Teaching Assistantships include a waiver of out-of-state tuition, and a waiver of a portion of in-state tuition, if the number of work hours exceeds 10 per week. The third category of support is a fellowship provided by governmental agencies or other sources. The fourth category is based on demonstrated financial need. Financial assistance based on financial need is administered by the Office of Student Financial Aid, (http://nau.edu/finaid/; P.O. Box 4108, Flagstaff, AZ 86011-4108; 928-523-4951), with programs described in a brochure titled Financial Aid, available from that office. For all kinds of support, formal 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 funds provided to the School from the Bureau of Forestry Research, 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 Graduate Coordinator and to faculty doing research in the area in which the student is interested.

All half-time assistantships include a commitment of 20 work 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 portions of in-state tuition and other registration fees that are not waived as part of the assistantship. 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 (e.g., Peace Corps Master's International assistantships, see Chapter 6 – Master of Forestry). Graduate students who receive half-time assistantships are not permitted to have employment outside the School of Forestry.

State-supported M.S. Research Assistantships are typically limited to two years. There is no specific limit on the duration of externally funded M.S. Research Assistantships. State-supported Ph.D. assistantships are typically limited to 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, following failure to improve performance after a performance evaluation.

CHAPTER 10 - 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 six hours of grade "C".
- 3. A grade of "B" or better in the fifteen credit hours of emphasis area courses.
- 4. Completion of at least nine hours of credit each academic semester.

In addition, all Graduate Assistants must attend in their first semester of employment: a) the University Graduate Assistant Orientation. This orientation is designed to familiarize Graduate Assistants with the goals of the University and the Assistant's role in achieving these goals. b) NAU's Preventing Workplace Harassment training. This is an online training course available at http://training.newmedialearning.com/psh/narizonau/index.htm.

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 thesis or dissertation research. The work schedule may vary but may include more hours during the summer, often up to 40 hours/week. If the GRA works 20 hrs weekly during the academic year, and is not paid extra during the summer, the expectation for work is 20 hrs weekly on average across the calendar year. Faculty may pay GRAs over the summer, in which case the number of weekly summer hours will be negotiated between the faculty and student. GRAs are not expected to work holidays and a reasonable amount of time off during the calendar year should be negotiated with the major professor(s).
- 3. 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 his or her 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.

- 4. Graduate Research Assistants working at the half-time level (20 hours per week) are not permitted to have employment outside the School.
- 5. Graduate Research Assistants are expected to be self-motivated and work with minimal supervision from the major professor.
- 6. At the discretion of the major professor, Graduate Research Assistants may be required to help on other graduate student and faculty projects.
- 7. 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.
- 8. Graduate Research Assistants may occasionally be asked to assist in recruitment efforts such as Career Days with approval of the major professor.
- 9. 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.
- 10. Graduate Research Assistants are expected to be members of and participate in professional organizations.
- 11. Graduate Research Assistants are expected to publish the results of their thesis or 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 one year of graduation.
- 12. After completion of all required course work except dissertation, a resident doctoral graduate student on half-time assistantship may petition to register for six credit hours a semester. Such a petition should be approved by the Graduate College and be endorsed by the student's major professor and the Executive Director of the School of Forestry.

The student's major professor will determine whether the student has satisfied the above

conditions.

Written evaluation by the major professor of the performance of each Graduate Student is required for each fall and spring semester using the Graduate Assistant Evaluation Form or the School of Forestry Graduate Student Evaluation Form (Appendix, or http://nau.edu/CEFNS/Forestry/Student-Resources/Graduate-Handbook/)

CHAPTER 11 - STUDENT'S ROLE IN THE SCHOOL

A graduate student occupies a special place in the School and the University. Graduate students are in many ways closer to the faculty than to undergraduate students. 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 and research. Many are employees of the School, University, and State, and are representatives of the School on and off campus. 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 reduced rates.

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 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 State or 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 actions, 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. Requests for equipment should be directed to the School of Forestry 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.

Office space will be provided to all graduate students if possible. If space is limited, priority is

given to graduate students who are employed by the School of Forestry (e.g., research or teaching assistantships, other sources of financial support that clearly benefit the School) based on seniority. When all funded students are allocated office space then non-funded students may be assigned space on a seniority system. Full-time research associates, technicians, or post-doctoral researchers 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 Executive Director of the School of Forestry of the impending arrival of new students or the departure or 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 Executive Director of the School of Forestry 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.

CHAPTER 12 - 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 the ideas or data of others.
- Misrepresentation of academic credentials.

Allegations of academic misconduct should be brought immediately to the attention of the major professor and the Executive Director of the School of Forestry. The major professor and Executive Director of the School of Forestry 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 College for appropriate University-level action.

CHAPTER 13 - GRIEVANCE AND APPEAL PROCEDURES

Students with significant complaints about any aspect of their education in the School of Forestry first should attempt to resolve the issue informally. Examples of informal resolution are addressing such complaints first directly to the person causing the grievance, second to the student's major professor, and third to the Graduate Coordinator, and next to the Executive Director of the School in order to reach a settlement within two weeks if possible. When none of the above attempts are successful, the student should follow the formal grievance procedures established by the University and described in the University Student Handbook (<u>http://nau.edu/student-life/Student-Handbook/</u>) and Graduate College policies (for example, <u>http://nau.edu/GradCol/Student-Resources/Succeeding/Policies/</u>).

Grade appeals will be treated as described in the University Student Handbook (http://nau.edu/student-life/Student-Handbook/).

CHAPTER 14 – GRADUATE PROGRAM ASSESSMENT

Regular assessment of student desired learning outcomes in SOF graduate programs is desirable for evaluation of curriculum effectiveness and improvement. The SOF faculty, led by the Graduate Coordinator, will evaluate student desired learning outcomes using rubrics and record data on standard forms using procedures described for each degree in the curriculum maps at the end of this section.

Hard copies of the evaluation forms are available to faculty in the School of Forestry faculty lounge, and electronic copies are available from the section "Graduate Program Assessment Forms" at: <u>https://nau.edu/CEFNS/Forestry/Faculty-and-Staff/Procedures-Policies-Reports/</u>. The forms also are available on the School's server

(\\naushares\forestry\office\graduatecoordinator) in the folder "Assessment Plans Graduate Program." Completed forms will be given to the School of Forestry CGP immediately upon completion. Each summer, the CGP will enter raw data from the last academic year's fall and spring semesters into a spreadsheet, and then compete summary statistics (mean, median, SE, range) of student performance for each desired learning outcome. The CGP will present findings from the analysis to the faculty for reflection and discussion at the School's fall annual retreat (typically late August). The CGP will prepare a brief written report that captures the faculty discussion. The raw data, data summary, and report for each year will be stored by the CGP on the School's server (\\naushares\forestry\office\graduatecoordinator) in the folder "Graduate Program Assessment Data and Reports." In the fall semester of each year, the School's Curriculum Committee will reflect further on the assessment results and develop improvements to the assessment process and curriculum as needed. By spring break of the following year, the CGP will submit to the OCLDAA an annual assessment report consisting of:

- 1. Curriculum and assessment plan (this document, revised as needed in the future);
- 2. Table of efforts achieved in current academic year;
- 3. Table outlining efforts that will be pursued, by whom and when, for the upcoming academic year.

Master of Forestry Desired Learning Outcomes and Assessment Plan/Map March 5, 2018

Desired Learning Outcome	Where	When	How	By Whom
1. Fundamental knowledge of forest ecosystem, forest management & economics, & forest social sciences	 FOR 689 (Professional Paper): professional paper 	• Last semester	 Assessment, professional paper with rubric 	 Each member, professional paper reading committee
 Understanding of professional ethics, & how ethical issues frame decisions concerning the management of forested land 	• FOR 689 (Professional Paper): professional paper	• Last semester	 Assessment, professional paper with rubric 	 Each member, professional paper reading committee
3. Effective written communication about forestry & forest management	 FOR 689 (Professional Paper): professional paper 	• Last semester	 Assessment, professional paper with rubric 	 Each member, professional paper reading committee
4. Effective communication about forestry and forest management in oral and poster presentations	 FOR 692 (Proseminar) required course FOR 689 	 Last or next to last semester Last 	 Assessment, oral presentation & poster with rubric Assessment. 	Course instructor Each
	(Professional Paper): Professional paper presentation	semester	professional paper presentation with rubric	member, professional paper reading committee
5. Ability to evaluate trends and effects in data	 FOR 689 (Professional Paper): professional paper 	 Last semester 	 Assessment, Professional paper with rubric 	 Each member, professional paper reading committee
 Ability to produce new insights, tools, or approaches about forestry and forest management 	 FOR 689 (Professional Paper): Professional paper 	• Last semester	 Assessment, professional paper with rubric 	 Each member, professional paper reading committee

Master of Science in Forestry Desired Learning Outcomes and Assessment Plan/Map March 5, 2018

Desired Learning Outcome	Where	When	How	By Whom
1. Fundamental knowledge about forest ecosystems and human management of forests	 FOR 699 (Thesis): thesis & defense 	 Last semester 	 Assessment, thesis & defense with rubric 	 Each member, thesis committee
2. Understanding and use of research methods, modes of	 FOR 690 (Research methods) 	• First semester	 Assessment, research proposal with rubric 	Course instructor
appropriate in forestry	• FOR 699 (Thesis): thesis & defense	 Last semester 	 Assessment, thesis & defense with rubric 	 Each member, thesis committee
3. Understanding of research ethics	 FOR 690 (Research methods) 	• First semester	 Assessment, course assignment and research proposal with rubric 	Course instructor
	 FOR 699 (Thesis): thesis & defense 	• Last semester	Assessment, thesis & defense with rubric	 Each member, thesis committee
 Expertise in planning a forestry research project 	 FOR 690 (Research methods) 	 First semester 	 Assessment, research proposal with rubric 	 Course instructor
	 FOR 699 (Thesis): thesis & defense 	 Last semester 	 Assessment, thesis & defense with rubric 	 Each member, thesis committee
5. Expertise in executing a forestry research project	 FOR 699 (Thesis): thesis & defense 	 Last semester 	 Assessment, thesis & defense with rubric 	 Each member, thesis committee
6. Effective written communication about forestry research	 FOR 690 (Research methods) 	• First semester	 Assessment, research proposal with rubric 	Course instructor
	 FOR 699 (Thesis): thesis & defense 	 Last semester 	 Assessment, thesis & defense with rubric 	 Each member, thesis committee
7. Effective communication about forestry research in oral and poster presentations	 FOR 692 (Proseminar) 	 Last or next to last semester 	 Assessment, oral presentations & posters with rubric Assessment, final 	 Course instructor
	 FOR 699 (Thesis): oral presentation & defense 	Last semester	thesis oral presentation & defense with rubric	 Each member, thesis committee

PhD in Forestry Desired Learning Outcomes and Assessment Plan/Map March 5, 2018

Desired Learning Outcome	Where	When	How	By Whom
1. Fundamental knowledge about	Comprehensive	• 2th to 4th	• Assessment,	• Each
forest ecosystems and human	exam	year	written &	member,
management of forests			oral exam	dissertation
management of forests			with rubric	committee
	• FOR 799	• Last	• Assessment,	• Each
	(Dissertation):	semester	dissertation	member,
	Dissertation &		& defense	dissertation
2. Even at language about a	a Comprohensive	a 2th to 4th	• Accessment	committee
	• Comprehensive	• 2011 to 401	• Assessment,	• Edcii member
specific research topic in forest	CAUL	year	oral exam	dissertation
science (dissertation topic)			with rubric	committee
	• FOR 799	 Last 	 Assessment, 	• Each
	(Dissertation):	semester	dissertation	member,
	Dissertation &		& defense	dissertation
	defense		with rubric	committee
3. Understanding of research	• FOR 690	• First	 Assessment, 	Course
ethics	(Research	semester	course	instructor
	methods)		assignment	
			& research	
			proposal	
	• Comprohensiv	• 2th to 4th		• Each
		 Ztil to 4til vear 	• Assessment,	• Eduli member
	eexam	уса	oral exam	dissertation
			with rubric	committee
	• FOR 799	• Last	 Assessment, 	• Each
	(Dissertation):	semester	dissertation	member,
	Dissertation &		& defense	dissertation
	defense		with rubric	committee
4. Expertise in planning a forestry	• FOR 690	• First	• Assessment,	Course
research project	(Research	semester	research	instructor
	methods)		proposal	
			with rubric	
	• FOR 799	• Last	• Assessment,	• Each
	(Dissertation):	semester	dissertation	member,
	defense		with rubric	committee
5 Expertise in executing a forestry	• FOR 799	• Last	Assessment	• Fach
5. Expertise in executing a lorestry	(Dissertation)	semester	dissertation	member.
research project	Dissertation &		& defense	dissertation
	defense		with rubric	committee
6. Research significantly advances	• FOR 799	• Last	• Assessment,	• Each
scientific understanding of forests	(Dissertation):	semester	dissertation	member,
	Dissertation &		& defense	dissertation
	defense		with rubric	committee

7. Expertise with research methods	• FOR 690	• First	• Assessment,	Course
used in forest science	(Research	semester	research	instructor
	methods)		proposal	
			with rubric	
	 Comprehensiv 	• 2th to 4th	• Assessment,	• Each
	e exam	year	written &	member,
			oral exam	dissertation
	• EOP 700	• Last	Accossmont	 Each
	(Dissertation)	semester	dissertation	member
	Dissertation &	semester	& defense	dissertation
	defense		with rubric	committee
8. Effective written communication	• FOR 690	• First	• Assessment,	Course
about forest science	(Research	semester	research	instructor
about forest science	methods)		proposal	
			with rubric	
	 Comprehensiv 	• 2th to 4th	 Assessment, 	 Each
	e exam	year	written	member,
			exam with	dissertation
	500 700		rubric	committee
	• FOR 799	Last	 Assessment, 	• Each
	(Dissertation):	semester	with rubric	discortation
	Dissertation		with rubite	committee
9. Effective communication about	• FOR 692	• 3 rd year	 Assessment, 	Course
forest science in oral and noster	(Proseminar)		oral	instructor
procentations			presentation	
presentations			s & posters	
			with rubric	
	• FOR 799	• Last	 Assessment, 	• Each
	(Dissertation):	semester	dissertation	member,
	Dissertation		presentation	dissertation
	presentation		with rubric	committee
10. Ability to plan and teach a	• FUK 693	• 2th to 4th	 Assessment, 	 Course instructor
college-level course using	Practicum	year	nlan &	
innovative teaching/learning	racticutty		performanc	
approaches			e with	
			rubric	

CHAPTER 15: COURSE LIST AND DEGREE REQUIREMENTS

The School of Forestry offers many courses that meet degree requirements. The following table represents the most current list of course offerings and where courses may be counted toward graduate degrees. Students should use this list as a reference guide only for completing the draft program of study.

Table 1. List of coursework satisfying degree requirements, by department, course number, and category. REQ = required for degree. F = fall, S = Spring, B = both semesters, * = offered odd years only, † = offerend even years only. Courses without a semester specific may not be offered regularly, or the timing of this course has varied over the past few years.

			its	pa	Fo	unda [.] atego	tion prv		M.F	. Program		M.S. Program		Ph.D.	Program	
Dept	Course #	Course Name (note some courses are cross-listed as both undergrad and grad courses (e.g. 454/554))	Number of cred	Semester offer	A	В	c	MF REQ	Ecosystem Science	Forest Mgmt Sciences and Economics	Forest Social Science	MS REQ	PhD REQ	Ecosystem Science	Forest Mgmt Sciences	Forest Social Science
FOR	211	Forest Mapping and Measurement	3	F			х									
FOR	212	Trees and Forests of North America	2	S	х											
FOR	213	Ecology and Management of Forest Soils	3	S	х											
FOR	220	Introduction to Forest and Range Plants	3	F	х											
FOR	225	GIS Tools in Forestry	2	S			х									
FOR	230	Multicultural Perspectivesof Natural Resource Management	3	В		х										
FOR	251	Introduction to Wildland Fire	3	В	х	х										
FOR	255	International Wildlife Issues	3	F	х	х										
FOR	483	Forestry in the Wildland-Urban Interface	3	S		х										
FOR	313	Forest Ecology I	4	F	х											
FOR	315	Silviculture: Applied Forest Ecology	4	F		х										
FOR	319	Forest Operations	3	F		х										
FOR	320	Forest Biometrics	3	F		х										
FOR	321	Forest Watershed Hydrology	2	F	х											
FOR	340	Environmental Hydrology	3	S	х											
FOR	360	Natural Resources Policy	3	S		х										
FOR	381	Forest Ecosystem Management	3			х										
FOR	382	Ecological Restoration Applications	3	F	х	х										
FOR	415	International Forestry	3	S		х										
FOR	442	Principles of Wood Science and Technology	3			х										
FOR	445	Wilderness Management	3	F		х										
FOR	449	Fire Monitoring and Modeling		F*		х	х									
FOR	451	Fire Ecology and Management	3	S*	х	х										
FOR	452	Forest Pathology	3	F	х											
FOR	453	Forest Insects	3	S	х											
FOR	454	Forest Health	3	S	х											
FOR	465	Watershed Restoration	3	S		х										
FOR	468	Conservation Genetics	3		х											

			1	T	1	1	1				1		1	1	1	-
FOR	493	Natural Resource Economics	3			х										
FOR	500	Ecosystem Science and	3	F	х				х	х				х	Х	
-		Management Principles														
FOR	504	Machine Learning in Ecology &	3		х	х			х					Х		
-		Resource Management														
FOR	505	Forestry Seminar Series	1	В				Х				х	х			
FOR	510	Multiple Resources Silviculture	3			х				Х					Х	
FOR	515	International Forestry	3	S		х			Х		х			Х		х
FOR	517	Dendroecology	3	F*					Х					Х		
FOR	520	Applied Forest Stand Dynamics	3		х	х			Х					Х		
FOR	521	Forest Soils	3		х				х					Х		
FOR	525	GIS and Spatial Techniques in	4	F			х			х					х	
		Forestry														
FOR	532	Social Research Methods in	3	F			х				х					x
		Forestry														
FOR	542	Principles of Wood Science and Technology	3		х	х				X					x	
FOR	543	Ecology And Management Of	3	S	Х				х	х				х	х	
		Introduced Species In Forests														
		And Rangelands														
FOR	544	Landscape Ecology	3	S†	х				Х					Х		
FOR	545	Rangeland Ecology and	3	S*	х				х	Х				Х	х	
		Management														
FOR	550	Forest Tree Ecophysiology	3		х				Х					Х		
FOR	551	Fire Ecology and Management	3	F†		х			Х	Х				Х	х	
FOR	552	Forest Tree Diseases	3	F	х				Х					Х		
FOR	553	Forest Entomology	3		х				Х					Х		
FOR	554	Integrated Forest Health	3	S	х				Х					Х		
FOR	560	Wetland Ecology and	3	F	х				Х	Х				Х	Х	
		Management														
FOR	563	Watershed Hydrology	3	F	х				Х					Х		
FOR	565	Watershed Restoration	3	S					х	Х				Х	х	-
FOR	568	Conservation Genetics	3		х											
FOR	569	Forest Genetics	3		х											
FOR	573	Human Dimensions of Natural	3	F		х				х	х				х	х
		Resource Management														
FOR	577	Concepts in Ecology	3													
FOR	580	Ecological Restoration Principes	3	F	х				х					х		
FOR	582	Ecological Restoration	3			x			x					х		
-		Applications														
FOR	593	Natural Resources Economics	3			х				х					х	
FOR	604	Wildlife Habitat Relationships	3		х	x			x					x	x	
FOR	633	Ecological Economics	3			x				x					x	
FOR	689	Professional Paper	3	-				x								
FOR	690	Research Methods	3	F								x	x			
FOR	692	ProSeminar	2	S				x				x	x			
FOR	693	Teaching Practicum	2	S				~				~	x			
FOR	699	Thesis	1-	-								x				
FOR	799	Dissertation	-	-								~	x			
GSP	320	Introduction to Remote	Δ	F			x						~			
35	520	Sensing					^									

APPENDIX A: SCHOOL OF FORESTRY GRADUATE STUDENT FORMS

(Available at https://nau.edu/forestry/internal-resources/graduate-student-handbook/)

Form 1	Recommendation for Graduate Study
Form 2	Ph.D. Student Progress Evaluation Report
Form 3	Ph.D. Student Teaching Evaluation
Form 4	Report on Results of Written Comprehensive Examination
Form 5	Report on Results of Oral Comprehensive Examination
Form 6	Graduate Assistant Evaluation
Form 7	Approval of Outside-NAU Master of Science Thesis Committee Member
Form 8	Foundation Course Plan
Form 9	Approval of Program of Study, Foundation Coursework, and Research Prospectus

Graduate College forms are available at <u>http://nau.edu/GradCol/Student-Resources/</u>, and at <u>http://nau.edu/GradCol/Student-Resources/Theses-and-Dissertations/</u>.

Form 1 Recommendation for Graduate Study

School of Forestry Northern Arizona University NAU Box 15018 Flagstaff, Arizona, U.S.A. 86011-5018

ne		First Name			Middle Na	ime		
Please keep your current	addres	s on file with NAU: Log in to	o LOUIE d	at http://	/www.n	au.edu/	louie	
Please read the following carefu	lly befo	re issuing or completing this fo	rm:					
TO THE CANDIDATE: Plea reco choi	se check mmendii ce or fail	one of the following options before ng you. <u>This form will not be accep</u> to sign below.	e you send oted if you t	or give thi fail to desi	s form to t gnate the o	he person option of ye	<u>our</u>	
PLEASE NON-CONFIDE CHECK non- confident ONLY CONFIDENTIA	NTIAL RI al recom	ECOMMENDATION. The above-nar mendation may be shown to the c MENDATION. I elect to keep this	med person andidate at recommend	elects to I his or her lation conf	keep this request.	ecommend d I waive a	ation III my	
ONE OPTION 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.								
		Candidate's Sig	nature and	d Date (M	lust be sig	gned to b	e vali	
TO THE RECOMMENDER:		Please check appropriate box for each category	No Basis for		Upper Half but not	Upper 25% but not		
The person whose name appea on this form wishes to ask you	ſS		Judge- ment	Lower Half	Upper 25%	Upper 2%	Upp 2%	
for a recommendation regardin	1	Native Intellectual Ability						
his or her qualifications for	,	Breadth of General Knowledge						
graduate study in forestry. You	r	Interest in Their Field						
honest and careful statement		Oral Expression Ability					l l	
and evaluation will be		Written Expression Ability						
appreciated. Please rate this		Ability to Work with Others					[
applicant in comparison with		Emotional Maturity					[
other students of the same age		Promise as a Teacher]	
and position.		Promise as a Researcher						
		Independence					L	
In what capacity do you know this person Please attach a letter, or use the sp	ace belo	w for additional comments.	and for	r how long	?			
(Type or print your name)		(Title or position) Your Employer			(Sigr	nature)		

Mail Completed form to:

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

Form 2 Ph.D. Student Progress Evaluation Report

(To be submitted on an annual basis)

School of Forestry Northern Arizona University NAU Box 15018 Flagstaff, Arizona, U.S.A. 86011-5018

Last Name			First Name	Middle Name
NAU ID I. COURSEWORK				
Yes	No No	Α.	Have courses in Program of Study been completed If not, explain reasons for non-completion, and de the courses.	d as scheduled? tail the steps anticipated to complete
Yes	No No	В.	Is performance in coursework satisfactory? If not, explain steps anticipated to correct unsatist	factory performance.
		C.	If completion or satisfactory performance issues v discuss the progress on the plan(s) to address the	vere noted at the last evaluation, ese issues.
		D.	Comments	
Satisfactory	Unsatisfactory	E.	Overall Coursework Progress Evaluation	
II. RESEARCH AND DI	SSERTATION PREPARA		4	
Yes	No No	Α.	Has performance and progress on the dissertatior If not, detail the steps anticipated to achieve satist	n research been satisfactory? factory progress.
		В.	If completion or satisfactory performance issues v discuss the progress on the plan(s) to address the	vere noted at the last evaluation, ese issues.

	C.	Comments		
Satisfactory Unsatisfactory	D.	Overall Research and Dissertation	on Preparation Evaluation	
III. OVERALL EVALUATION	A.	How would you rate the candidat	te overall?	
Signatures				
Program Committee		Name	Signature	Date
Major Professor:				
Committee Members:				
Graduate Coordinator:				
Exec Director - School of Forestry:				

Distribution: Major Professor School File Student

Form modified: May 3, 2005

Form 3 Ph.D. Student Teaching Evaluation

School of Forestry Northern Arizona University NAU Box 15018 Flagstaff, Arizona, U.S.A. 86011-5018

Last Name	First Name	Middle Name
NAU ID	Evaluation Date	
Teaching is a crucial part of doctoral student educat observations, preferably at widely separated interva meeting within a few days of each observation. In a Instructor Teaching Evaluations used by Forestry Fac	ion. The evaluation of teachin ils. Constructive criticisms sho ddition, each student should b culty.	g should be based on at least two classroom uld be given to the student during a personal we evaluated by the classroom students using the
I. AREA EVALUATIONS		
A. Knowledge of Subject Matter (organization, ap	propriate level, response to que	stions)
B. Demeanor, Appearance, Control of Class, Rela	ationship with Students.	
C. Examinations and Quizzes (appropriate level,	coverage of material, ease of und	derstanding)
B. Participation in Meetings, Preparation Session	is, and Completion of Out-of-Cla	ss Assignments.

II. OVERALL TEACHING EVALUATION

Satisfactory Unsatisfactory
Signatures

Program Committee	Name	Signature	Date
Major Professor:			
Evaluators:			
Student:			

Distribution: Major Professor School File Student

Form modified: May 3, 2005

Form 4 Report On Results of Written Comprehensive Examination

School of Forestry Northern Arizona University NAU Box 15018 Flagstaff, Arizona, U.S.A. 86011-5018

Last Name	First Name	Middle Name
NAU ID	Examination Date	

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

	Committee Member Name	Signature	PASS	FAIL ¹
-				
-				
-				
-				
-				
	¹ Committee members failing a student must attach	a written explanation of reasons for failing grade.		

Vote of Committee:

Passed votes Failed votes 3/4 majority of the committee members required to pass.

Additional Requirements (if any) and Justifications

Executive Director – School of Forestry

Date

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

Form 5 Report On Results of Oral Comprehensive Examination

School of Forestry Northern Arizona University NAU Box 15018 Flagstaff, Arizona, U.S.A. 86011-5018

Last Namo		First Name	Middle Name	
Last Name		Filst Name		
NAU ID		Examination Date		
This evaluati	on is completed following the co	ompletion of coursework requireme	nts as detailed in the School of	Forestry
Graduate St	udent Policies and Procedures Ha	andbook.		
Signatures				
	Committee Member Name	Signature	PASS	FAIL ¹
			L	
¹ Committ	ee memhers failing a student must	attach a written explanation of reasons	for failing grade	
commu	ee members taning a stadent mast	attach a written explanation of reasons		
Vote of Comm	ittee: Passed vot	tes		
	Failed vot	tes		
	3/4 majority of the cor	nmittee members required to pass.		
Additional Rec	uirements (if any) and Justifications			
Executive Dire	ctor – School of Forestry	Date		
Distribution	Major Professor			
Distribution.	Thesis Committee Members			
	School File Graduate College			
	Student		Form modified: Ma	irch 1, 2008

Form 6 Forestry Graduate Student Evaluation Form

This form is to be completed by graduate students and their respective supervisor/advisor(s) on a semester or annual basis. Each section has specific instructions as to who is responsible for completion. All sections should be completed *prior* to meeting to promote discussion. This evaluation process is to recognize progress and identify opportunities for growth, for **both** advisors and advisees. Upon completion, this form will be turned into the School of Forestry Graduate Coordinator and/or the Executive Director <u>at least 3 weeks before the</u> <u>semester ends</u>. If you have any concerns about completing this, please see the Graduate Coordinator or Executive Director.

<u>Note:</u> If you are a TA, please see Appendix I at the end of this document after completion of sections I, II, and III.

Grad. Student Name:	Degree:PhDMSMF Certificate/Other
Supervisor(s):	Today's date:
Evaluation frequency? Semester Annual	Previous evaluation date:
Grad. Student position and/or funding:GA	RA TA Unfunded Other

Section I: Graduate student self-reflection. Completed by graduate student only.

<u>Self-reflection instructions</u>: Complete Section I prior to meeting with your supervisor. In this section, solely focus on yourself and your progress. Reflection concerning your working relationship with your advisor is in Section II.

My most notable accomplishments or examples of professional development during this reflection period in my work as a graduate student:

1.

2	•

3.

Things I want to do more, or start, to be even more effective in my position and to help me in the future:

1.

2.

3.

Things I want to do, change, or improve to be even more effective in this role and to help me succeed:

1	
т	٠

- 2.
- _
- 3.

Section II: Supervisor and graduate student rating and reflection. Both sections completed by supervisor and graduate student.

<u>Rating and reflection instructions</u>: The supervisor and graduate student each complete both parts of Section II prior to meeting. Part I of this section is primarily focused on the graduate student. Part II is primarily focused on the advisor. Please use the following definitions for the ratings:

Dissatisfied: Significant efforts toward improvement should be made.

Room for improvement: Meets expectations in some areas, but improvement is needed in others. Satisfied: Meets all expectations, the individual is on track.

Beyond satisfied: Going above and beyond expectations.

Part I: Graduate student

Job Knowledge and Skills			
Demonstrates technical and functional knowledge and skill level to complete assigned tasks efficiently and effectively. Includes adapting to new requirements and pursuing development opportunities related to tasks.			
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Reliability			
Task completion and follo project objectives and adl	w-up including: meeting deadli hering to university/college/uni	nes on time without s t policies and proced	sacrificing accuracy, quality, or ures.
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Teamwork			
Works well with and for o respects diverse points of opportunities for access a	thers, contributes to lab workir view; engages the talent, expe nd success of others.	ng environment and is riences, and capabilit	s welcoming. Recognizes and ies of others and creates
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Planning/Organizing			
Works efficiently and productively, and effectively manages resources (labor, time, materials, etc.). Includes prioritizing, planning, and organizing work for greatest efficiency and effectiveness.			
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Professionalism			

Works collegially and cooperatively with others. Uses appropriate mode of communication and is respectful

of supervisor and their pr	ofessional and personal time.		
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Positive/proactive appro	ach to change and improvem	ents	
Demonstrates receptivity thinking skills and presen	to new ideas and approaches ts project related-material in a	s and flexibility in workir a clear, well-organized v	ng with a team. Uses critical vay.
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Initiative/Innovation			
Identifies challenges, env Generates new and origin and ideas to supervisors.	isions possible outcomes or o nal ideas that relate to the pos	bstacles and responds in sition if applicable. Effec	n a manner to minimize risk. tively communicates issues
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Communication Style			
Articulates in a clear, resp questions respectfully.	pectful manner. Is friendly, ge	nuine, and brings up ide	as, concerns and/or
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied

What are the main strengths of this graduate student?

What are areas of improvement for this graduate student? Are there limitations or barriers currently preventing the graduate student from succeeding or meeting expectations?

Other comments:

Part II: Advisor			
Project Guidance and	d Professional Development		
Provides guidance or advisor or given guid	n project and professional dev ance on where to find resour	velopment. Student feels we .ces.	II-equipped and supported by
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Reliability/Feedback			
Assigns tasks with ap Provides feedback or	propriate deadlines while ad assigned tasks in a timely m	hering to university/college/ anner.	unit policies and procedures.
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Teamwork			
Contributes to an inc engaging and creates	lusive and welcoming enviro equal opportunities for acce	nment. Recognizes and responses and success of others.	ects diverse points of view;

Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Planning/Organizing			
Manages project effic etc.) necessary. Priori meetings with studen	tiently and productively, and tizes, plans, and organizes v t and/or lab to ensure cons	d provides and manages resou work for greatest efficiency and istency.	rces (labor, time, materials, d effectiveness. Plans regular
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Professionalism			
Works collegially and of student and their p	cooperatively with others. professional and personal tir	Uses appropriate mode of com me.	nmunication and is respectful
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Positive/proactive ap	proach to change and imp	rovements	
Demonstrates recept students' critical thin	ivity to new ideas and appro king skills and is open to fee	baches and flexibility in workin dback.	g with a team. Helps engage
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Communication style			
Articulates in a clear, appropriately.	respectful manner. Engages	s in discussion, brings up ideas,	, concerns and/or questions
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Availability			
Reasonably available	for questions and guidance.		
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Learning Environmen	t		
Helps engage critical thinking skills and challenge the student in an appropriate and reasonable manner.			
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied

What are the main strengths of the working relationships between advisor(s) and advisee?

Are there areas where the working relationship between advisor(s) and advisee could be improved? Are there limitations or barriers currently preventing the advisor from succeeding or meeting expectations?

Comments:

Section III: Research or Project Observations. Completed by the supervisor only.

Research Contributio	n		
Contributes to researd of creative activity.	ch, discovery of new knowle	edge, development of new tech	nniques, and or/other forms
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Outputs and Outcom	es		
Qualitative and quant recognition by the aca	itative assessment of resea ademic and professional co	rch, other creative programs, a mmunity.	ind contributions, and
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Ethical Standards			
Adherence to the high	nest possible ethical standa	rds.	
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Methodology			
Demonstrates sound	research methodology, disc	cussed and approved in conjunc	ction with supervisor.
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied
Teamwork			
Assists others in the lab, cleans up, re-orders supplies or communicates when supplies are needed, etc. Has a team perspective on all duties.			
Dissatisfied	Room for Improvement	Satisfied	Beyond Satisfied

Is the graduate student making appropriate progress on their research? If not, what are ways they can improve to make appropriate progress?

Comments:

Section V: Action plan and final steps

Part I: Action Plan

Now that you have completed and discussed each section, please make an action plan for areas in which need improvement. If satisfactory or above ratings were met, please make note of what will continue to be done.

Part II: Final Steps

Thank you for completing the Forestry Graduate Student Evaluation Form. After discussion, this form is <u>required</u> to be taken to the School of Forestry Graduate Coordinator or the Executive Director **by the graduate student only**. The form should only go to the Executive Director if your direct supervisor is the Graduate

Coordinator. We encourage discussion of your evaluation upon delivery. For further information, please see the Graduate Student Handbook.

By signing your name below, you acknowledge that this form has been completed and discussed by the graduate student and supervisor, and that the form will be submitted to the Graduate Coordinator/Executive Director upon completion.

Graduate Student:	Date:
Supervisor/Advisor(s):	Date:
Graduate Coord. or Executive Director:	Date:

Form modified: July 1, 2023

Form 7 Approval of Outside-NAU Master of Science Thesis Committee Member

School of Forestry Northern Arizona University NAU Box 15018 Flagstaff, Arizona, U.S.A. 86011-5018

If a member of the Master of Science committee is not a member of the NAU Faculty (regular or adjunct), attach to this form the individual's vita or resume and provide the information requested below. Submit the completed form to School of Forestry Graduate Coordinator and then Department Chair/Director for approval. The approved and signed form should be placed in the student's departmental file.

Student name: _____

Faculty advisor: _____

Thesis Title or topic: _____

Outside-NAU committee member's name: _____

Expertise related to student's thesis:

Form 8 Forestry Foundation Course Plan

School of Forestry Northern Arizona University NAU Box 15018 Flagstaff, Arizona, U.S.A. 86011-5018

A. Forest Ecology and Biology; 3 semester credit hours in the following subjects(s): taxonomy, distribution, and ecological characteristics of trees and other important plants; physiology of trees, including metabolism and growth; forest stand dynamics; 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 tending the composition, growth and quality of forest stands to meet landowner objectives; water in forest ecosystems, including plant-water relationships, watershed condition and forest water quality; entomology and pathology, including the study of representative forest organisms, invasive species, and the application of integrated pest management; and wildlife and fish biology and ecology.

Course No./Title	Credit hours*	Grade	Term/ Year	University/program

*Specify quarter or semester

B. Management of Forest Resources, and Forest Resource Policy and Administration; 3 semester credit hours in the following subject(s): policy development; administration; land and resource planning; budgeting; financial and personnel management; integrated forest resource management at stand-, system-, and landscape-scales, with consideration of wood, forage, water, wildlife, fish, recreation, cultural, educational and aesthetic benefits; silviculture, including methods of establishing and controlling the composition, growth, and quality of forest stands, including fire ecology and use of fire; and forest engineering, harvesting, and utilization.

Course No./Title	Credit hours*	Grade	Term/ Year	University/program

*Specify quarter or semester

C. Measurement of Forest Resources; 3 semester credit hours in the following subject(s): 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.

Course No./Title	Credit hours*	Grade	Term/ Year	University/program

*Specify quarter or semester

Signatures

Student:	Date:
Advisor:	Date:
Graduate Coordinator:	Date:
School Executive Director:	Date:

Form modified: July 1, 2023

FORM 9: Approval of Program of Study, Foundation Coursework, and Research Prospectus (to be completed in the first year)

The Program of Study, Foundation Coursework Plan, and Research Prospectus (M.S. and Ph.D. only) have been reviewed and approved as indicated by the signatures below. Approval by the Major Professor indicates that the entire committee has reviewed, discussed and approved the required documents listed above. Readers for M.F. papers are not required to review and approve the M.F. documents.

Student Name:	Date
Major Professor:	Date
Signature:	
Co. Advisor (if applicable)	Data
	Date
Signature:	
	_
Graduate Coordinator:	Date-
Signature:	

Forestry TA Evaluation Form

School of Forestry Northern Arizona University NAU Box 15018 Flagstaff, Arizona, U.S.A. 86011-5018

Section IV: Teaching Observation. Only for TA's who are teaching classes directly for their supervisor. Completed by the supervisor only.

NOTE: This form is adapted from CEFNS. It may be more appropriate to use their form rather than this Forestry specific form. Please discuss which form is most appropriate with your supervisor.

Teaching observation instructions: This section is to only be completed if you are a TA who is teaching directly under

your advisor/supervisor. If you are a TA who is supervised by a different professor, we recommend filling this section out

with them.

Teaching Presentation

Presents knowledge, information, and ideas and engages students through a variety of means, including active learning, lecture, discussion, demonstration, laboratory experiences, and direct consultation with students.

___ Dissatisfied ___ Room for Improvement ___ Satisfied ___ Beyond Satisfied

Suitability of Content

Develops and delivers highly relevant, engaging content appropriate to the students' level. The amount of material

covered fits well with what should be expected of this session.

___ Dissatisfied ___ Room for Improvement ___ Satisfied ___ Beyond Satisfied

Communication Style

Articulates content with confidence. Presentation style is friendly, genuine, and animated. Teaching style promotes

learning, engagement, strong bonds with students, and opportunities for focus and mental breaks.

___ Dissatisfied ___ Room for Improvement ___ Satisfied ___ Beyond Satisfied

Organization

Prepares meaningful assignments and activities for students.

___ Dissatisfied ___ Room for Improvement ___ Satisfied ___ Beyond Satisfied

Evaluation of Students' Work

Evaluates student work objectively and consistently; provides helpful feedback to students. _____Dissatisfied _____Room for Improvement _____Satisfied _____Beyond Satisfied

Learning Environment

Employs effective pedagogical tools to stimulate critical thinking and/or creative abilities in students; provides clear, well-organized project-related material and easy to understand instructions; adheres to accepted standards of professional behavior in meeting responsibilities to students.

__ Dissatisfied ___ Room for Improvement ___ Satisfied ___ Beyond Satisfied

Office Hours and Availability (if applicable)

Clear communicate off office hours and availability. Present during these hours and seldomly cancels. ___ Dissatisfied ___ Room for Improvement ___ Satisfied ___ Beyond Satisfied

Please rate your level of support for this individual and future assistantship appointments

___ Dissatisfied ___ Room for Improvement ___ Satisfied ___ Beyond Satisfied

Recommendation for Rehire

___Yes ___No

Comments:

Supervisor's Open Response & Feedback to the Teaching Observation:

What did you find most effective about this class?

What did you find most effective about the TA's approach to leading?

What suggestions can you offer for improving the effectiveness of this course?

Signatures (print names and sign)

Student:	Date:	
	_	

Supervisor:_____Date: _____

APPENDIX B: GRADUATE STUDENT EXIT FORM

Graduate Student Exit Form

This form is to independently be completed by graduate students in the final week of their last semester. The goals of this form are: 1. Allow students to communicate their experiences during their time in the School of Forestry (SoF) and with their advisor, and 2. Learn what students after-graduation plans are and if they would like to keep in contact with the SoF. This will in-turn recognize successes and opportunities for growth. Upon completion, this form will be turned into the Graduate Coordinator and/or the Executive Director. In extenuating circumstances, you are free to take this to the Dean of CEFNS. This form will stay anonymous except from whom you turn it in to.

Grad. Student Name:	Degree:PhDMSMF Certificate/Other
Supervisor(s):	Today's date:

Section I: School of Forestry

Please rate your overall satisfaction level with the School of Forestry

Very dissatisfied	Somewhat dissatisfied	Neutral	Somewhat satisfied	Beyond satisfied
-------------------	--------------------------	---------	--------------------	------------------

Please elaborate on your above rating and describe your experiences in the School of Forestry. This could include, but is not limited to, interactions with faculty and staff, the overall environment, graduate program, facility, social life, etc.

Section II: Advising/Supervising

Please rate your overall satisfaction level with your advisor.

Very dissatisfied	Somewhat	Neutral	Somewhat	Beyond satisfied
	dissatisfied		satisfied	

Please elaborate on your above rating and describe your experiences with your advisor. This could include, but is not limited to, include their advising style, communication, guidance, support, availability, etc.

Section III: Future Direction

The School of Forestry is interested in what your after-graduation plans are and if you would like to keep in contact. Please take a few moments to answer these questions.

What are your after-graduation plans? This could include, but is not limited to, jobs, travel, internships, relocation, etc.

Would you like to keep in contact with the School of Forestry? If so, please leave your contact information in the designated area below.

Contact?	Yes	No
If yes, personal email:		
If yes, phone number:		

Is there anything else you would like to add?

Thank you for taking the time to fill out this form. Your time in the School of Forestry is valued and we wish you the best of luck in wherever life takes you!

APPENDIX C: REVISION HISTORY

November, 1993 Revised May, 1994 Revised January, 1995 Revised April, 1996 Revised May, 1998 Revised August, 2000 Revised January, 2001 Revised July, 2001 Revised July, 2002 Revised March, 2003 Revised May 11, 2004 Revised April 28, 2005 Revised November 21, 2005 Revised March 1, 2008 Revised December 19, 2008 Revised May 21, 2009 Revised March 9, 2010 Revised February 4, 2011 Revised February 7, 2012 Revised August 14, 2012 Revised April 18, 2014 Revised October 13, 2014 Revised May 14, 2015 Revised June 16, 2016 Revised June 1, 2017 Revised June 7, 2018 Revised May 22, 2019 Revised May 5, 2021 Revised September 29, 2023