Graduate Student Handbook

Geology MS and Environmental Sciences & Policy MS programs

School of Earth Sciences and Environmental Sustainability
2015-2016
USEFUL CONTACTS

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Northern Arizona University does not discriminate on the basis of race, color, age, religion, gender, national origin, disability, or veteran status in our admissions, employment and education programs or activities.
INTRODUCTION
This handbook is designed to guide you through the policies and procedures governing your career as a Master’s student in the Geology and Environmental Sciences and Policy Programs at NAU. These two Master’s degree programs are part of the School of Earth Sciences and Environmental Sustainability or SESES, which also has a MS Climate Science and Solutions program and a Earth Sciences and Environmental Sustainability PhD. We recognize that graduate study is much more than the meeting of mechanical deadlines, and your scholarly development is of paramount importance to the faculty. Your growth is cultivated individually throughout your graduate experience as you attain the foundation, independence, intellectual curiosity, and self-discipline necessary to be a productive scientist. The awarding of the Master’s of Science Degree recognizes your achievement of these goals. We hope that these guidelines make the "system" less frustrating so that you can direct your efforts toward your education and completion of your degree in a timely manner.

The Staff Program Coordinator for SESES graduate degree programs is Amy Wolkowinsky. She is a great first resource for answering many of your questions regarding the graduate program. She might refer you to one of the Faculty Coordinators for the Master’s of Science degrees (Prof. Ernie Duebendorfer for Geology and Prof. Nancy Johnson for Environmental Sciences). They can help with questions regarding your academic progress and personnel issues affecting your graduate studies. For most information on the MS degree, consult our Program and the Graduate College web pages.

The Graduate College sets the policies and deadlines that govern all graduate students at NAU. SESES has adopted additional guidelines to insure uniformly high standards. You should be aware of both sets of policies and review them periodically. Written petitions for exceptions may be submitted for special cases or in extenuating circumstances. If you have questions regarding any of the policies, please feel free to discuss them with your advisor, or the Graduate Program Coordinators. Do not rely on hearsay information from other students: see it in writing. It is your responsibility to see that any changes, exceptions, or other dispensations made on your behalf with regard to any policies contained in this manual are documented in writing. Be certain that any such documents are filed in your permanent records in the SESES office and, if applicable, the Graduate College. Be sure to keep a personal copy.

Programs of interest for Master’s students interested in teaching careers can access information available through the Center for Science Teaching and Learning web site (http://nau.edu/cefns/cstl/degrees-programs/).

FINANCIAL SUPPORT

Introduction
Financial support might be obtained from a variety of sources: (1) assistantships granted by the Graduate College upon the recommendation of SESES; (2) fellowships and scholarships awarded by the Graduate College and the SESES; (3) grants-in-aid of research awarded by off-campus organizations; (4) research assistantships in conjunction with funded research of individual faculty members. If you are interested in financial support, it is your responsibility to seek information from the variety of sources and follow the guidelines required. The Financial Aid Departmental office has a scholarship directory on the web (http://www.nau.edu/finaid/) that you might find helpful.
Teaching Assistantships
The Graduate College and University allocate state-funded graduate assistantships to the various departments. In SESES, most of these positions are used for graduate student teaching of undergraduate laboratory sections or field classes. Following the February 1 deadline, SESES will recommend to the Graduate College which applicants should receive available positions. If you were guaranteed two years of Graduate Assistantship, then you will automatically be considered for a TA unless you have a Research Assistantship. The initial award of an assistantship does not assure the recipient of continuous support until a degree is attained. SESES will support most M.S. students who are accepted into the program for two academic years provided that the student performs duties satisfactorily, maintains satisfactory academic progress, and SESES has positions and funds. Satisfactory performance of graduate assistants is described below. In some cases, teaching assistantships, if available, will be granted to third-year MS students, if approval is granted by the Graduate College. Students interested in this extra support should contact the Graduate Coordinator as soon as they are interested in this support.

Research Assistantships
Typically these positions are funded by agencies outside of the university, such as the National Science Foundation, but are administered through NAU. The duties of the student are controlled directly by the grantee, who is usually a faculty member in SESES or an affiliated agency. Students are selected for these positions by the grantee who will review all graduate applicant files in the field of interest. These positions carry the same rules and regulations as for teaching assistantships, but the type of work required depends on the research project. The student is directly responsible to the grantee. With research assistantships, students might or might not work directly on their thesis project. Because of the uncertainties of external funding, research assistantships are generally granted on a year-by-year basis. A student cannot have an RA for <10 hours per week.

In-State Tuition Waivers
A few waivers for in-state tuition are awarded each year to graduate students in SESES. **Students must be Arizona residents.** Teaching and research assistantships automatically carry a waiver for out-of-state tuition.

**PROCEDURES TO BE FOLLOWED ONCE YOU ARE ADMITTED**
As a full-time graduate student (≥9 credit hours per semester), particularly if you are funded through the Program, **you should complete your degree within two years.** The program is designed to be completed in approximately two years and we encourage you to finish in that time. Completing the program in two years, however, requires careful planning and an early start on thesis research. To meet a goal of two years, it is essential that you and your adviser develop a well-defined and clearly focused thesis research project by the end of the first semester so that you can complete the data collection within the first three semesters, leaving the 4th semester for thesis writing. Some students receive GA support from SESES in their 3rd year, but it is not guaranteed. Funding for third-year students is based on availability of funds, your progress in the program, and your academic performance. **You are encouraged to apply for outside scholarships or other financial aid to help cover the cost of your research and your 5th semester if it is necessary.** In any event, you should complete the majority of your course work in your first year.
If you enter the program with deficiencies, are working full-time outside of NAU, or have completed a summer internship, it is likely you will need at least an extra semester to complete the requirements. In addition, many professors have projects in hot-weather climates or internationally, and in some cases fieldwork cannot be done until the second winter of a student’s graduate career. Be sure to discuss this with your advisor.

Your progress in the program is reviewed yearly and you will receive written notice if your progress is not satisfactory. The terms of the evaluation are discussed in a subsequent section of these guidelines. You must complete your degree within six years and be continuously enrolled in accordance with Graduate College guidelines (i.e., take course units every semester).

Important Note Regarding Residency
In order to qualify for some types of financial aid you need to be an Arizona resident, and you should gain this status as soon as possible (see http://nau.edu/registrar/student-resources/arizona-residency/ or contact Karen Cornelius in the Graduate College).

Prior to the Beginning of Your First Semester
Prior to enrolling for your first semester, you must meet with your potential thesis advisor. During this meeting, it will be decided which courses you should take the first semester. These will include EES 605 and any deficiencies listed on your admission form. If you have obtained graduate credit for courses at another institution that did not count toward your undergraduate degree at that institution, you must obtain approval from your thesis committee as part of the Program of Study to apply these credits to your NAU program. In addition, you must submit a Petition for Transfer Credit (http://www2.nau.edu/gradcol/Forms/TransferCreditReq.docx) to the Graduate College and receive approval. A maximum of 8 credit hours of graduate courses with a grade of “B” may be transferred from another college or university. Criteria for acceptance of transfer credit are given on the Graduate College website at: http://nau.edu/gradcol/policies-and-forms/. Note that approval from the Graduate College is granted only on a case-by-case basis and is not guaranteed.

During the First Year
Your goal during the first year of graduate study is to become a candidate for the Master of Science degree. A student is recommended for advancement to candidacy when, in the judgment of the SESES faculty, the student has attained the academic and professional standards necessary to undertake research for the thesis. Students are strongly recommended to establish residency in Arizona (see section on residency below) in order to be eligible for in-state tuition waivers and Arizona resident tuition rates. (For 2014: 1 unit of in-state tuition and fees cost $739 compared with $1406 for out-of-state!)

Requirements for Advancement to Candidacy
1. Successful completion of all undergraduate course deficiencies determined by the Graduate Admissions Committee.
2. Graduate Regular standing in the Graduate College.
3. Completion of two semesters of full-time graduate study in residency at NAU (minimum of 9 credit hours) with a grade point average of at least 3.0. Students must complete EES 605 and 606, prior to advancement.
4. Acceptance by an advisor who will supervise the thesis and serve as chair of the student's thesis committee. This requirement must be met by the beginning of the second semester.
5. Selection of a thesis topic in consultation with the thesis advisor. This should be completed by the beginning of the end of the first and no later than the end of the second semester.
6. Selection of a thesis committee composed of members as specified somewhat differently by the Geology and the Environmental Sciences & Policy majors. It is the responsibility of the student to determine if the proposed committee members will agree to serve.
7. Completion of an approved thesis proposal. After approval of the thesis proposal by the thesis committee, the student may register for GLG/ENV 699 (thesis research). The proposal must be completed by the end of the second semester of residency. One copy must be filed with the Graduate Program Coordinator and one copy is given to the thesis advisor.
8. In consultation with the thesis advisor, the student will complete a Program of Study Form (http://nau.edu/gradcol/degrees-and-programs/programs-of-study-page/). The Program of Study Form must be approved by the thesis committee and submitted to the SESES Office to be stored in your file. When you submit your graduation papers you then submit the Program of Study to the Graduate Dean for approval, with a copy also given to the Graduate Program Coordinator. The Program of Study form includes all courses to be completed for the degree, the names of the thesis advisor and committee members, and the thesis title. The Program of Study constitutes a contract between you and the Graduate College; the College will compare this Program with your actual accomplishments prior to awarding the M.S. degree. In some cases the Program of Study might be modified. This requires completion of a new Program of Study form and approval by your advisor, and the Graduate Program Coordinator, and submission of the new program to the Graduate College. In no case will the Program of Study form be sent to the Graduate Dean before the thesis committee has approved the thesis proposal.
9. Advancement to candidacy will be made by the end of the second semester of residency at NAU. If the student fails to meet this deadline, then an official letter is sent to the student and advisor from the Graduate Coordinator stating that the student is not making satisfactory progress, and asking for a written response indicating causes for the lack of progress. If the approved proposal is not filed by the middle of the student's third semester (mid-October for fall admission, end of February for spring admission), s/he is no longer in good standing, will be placed on academic probation and is prohibited from receiving GA funding from SESES.

Selection of Thesis Topic, Advisor, and Committee
At the time of admission, you will meet with the Graduate Program Coordinator or your thesis advisor, to determine a first-semester course schedule and to discuss your research interests with the goal of selecting a thesis topic and advisor prior to the end of the first semester. Most of you already have an advisor and project in mind from the application process, but ultimately these are your decisions and not the decisions of a professor or the Graduate Program Coordinator. To select a final thesis topic and advisor you should initiate early discussions with faculty members with expertise and active research in your field of interest. You may talk to several faculty members during your first semester to determine the most suitable person to supervise your research. Remember, you will have a two- to three-year working relationship with this person. It might help to speak with present graduate students working with a particular professor to assess whether your interest, personality, and work habits are compatible with the professor. You might
wish to examine previous theses directed by a particular professor to get a feeling for her/his expectations. If you can identify a thesis topic during the first semester, you should then apply for external funding (Sigma Xi, Geological Society of America, etc.) in advance of the appropriate deadlines.

Following selection of an advisor and thesis topic, you and your advisor need to identify two (or more) additional committee members who will bring additional expertise to your research effort. Committee members may be selected from the regular faculty at NAU, adjunct professors at NAU, professionals from agencies, such as the U.S. Geological Survey office in Flagstaff or elsewhere, and professionals from organizations such as the Museum of Northern Arizona. If during your graduate study you wish to make any change in your degree program, thesis committee, or thesis topic, you must submit an amendment to your Program of Study. Your thesis advisor, the Faculty Graduate Program Coordinator, and the Graduate Dean must approve this amendment before changes are effected.

During your graduate study, you or your advisor may choose to discontinue the relationship. You can make this difficult decision on your own and should not feel pressure to stay with your original advisor if the relationship is not working for you. But make sure that you take any change seriously. The Faculty Graduate Program Coordinator is an important resource if you need consultation on these matters. Depending on the timing or cause for this change, the student might have to also change thesis topics and resubmit a thesis proposal. Such changes are unusual, but do occur due to illness, sabbatical leave, or other circumstances. A change of advisor or any member of the committee must be approved by the new advisor, the thesis committee, and the Faculty Graduate Coordinator, and submitted to the Graduate College for approval.

During All Semesters Prior to Your Final One
After admission to graduate study, you must complete your degree within six years. Students who are working on a thesis must register for at least one credit hour of GLG/ENV 699 (Thesis Research) each semester following formal admission to the program until the thesis has been completed and has been given final approval. Even if you are away from NAU, you must register for at least 1 credit hour in order to meet the University requirement of continuous enrollment. During the semester that you defend your thesis, you should register for at least 3 credit hours to reflect the amount of faculty time on your project. Students who are not registered for at least one credit each semester will need to apply for readmission to the Graduate College should they wish to continue. A one-time, 1-year extension might be granted only if there are extenuating circumstances.

In some cases, you might agree with your advisor that you will defend and finish your thesis during the summer. In this case, you MUST register for 1-3 Summer credit hours, to be determined by the thesis advisor, and your final, approved electronic thesis must be submitted by the beginning of August to the Graduate College (contact Alex Coleman in the Graduate College for specific dates) for a summer graduation date. If you expect to finish your thesis in the fall, it is better to defend in the fall as well, although you may defend in the summer and submit your thesis any time before the end of fall semester before the final Graduate College deadline (typically early to mid-December for a Fall semester graduation date). In this case you must register for fall credits. Faculty members are not on NAU contract over the summer, so your committee is not obligated to agree to a summer defense. It is important to communicate early and often with all committee members if you plan a summer completion.
Before enrolling for thesis credit hours, the student's advisor must be consulted to determine the amount and type of work expected to be completed for a specified number of credits during a given semester. This should be viewed as a contract, and each semester the advisor will judge whether or not the stated work was completed. Such work will be a criterion used in the evaluation of satisfactory or unsatisfactory progress of a graduate student.

**During Your Final Semester**

You must enroll for at least 1 credit during your final semester; you should enroll in 2-3 credits if using numerous NAU resources and faculty time. The final decision on the number of thesis units in which to enroll will be decided by your thesis advisor. You must also complete the following. (1) Submit an application for graduation (http://nau.edu/gradcol/student-resources/graduation/) and pay the appropriate filing fee prior to the deadline listed in the official NAU schedule for each term. Note that this deadline might be several months before graduation. (2) Meet with your committee at least three months before your defense target date to obtain the committee’s approval that you will be ready to defend and to set a formal thesis defense date. Examples of items that will be discussed and that you should be prepared to provide include (a) evidence that you have acquired all (or nearly all) the field and lab data necessary to complete the thesis, and you have completed all (or nearly all) analysis of the data, (b) a detailed outline (to the sub-subheading level) or completed first draft of your thesis, (c) documentation that off-campus lab work is or will be completed well before defense target date, (d) proof of completion or near completion of computer analysis or modeling, (e) compilation of most references, and (f) presentation of the main conclusions of your thesis to the committee. This meeting will serve to protect you from surprises during your defense. (3) Schedule your formal thesis defense date after all members of the committee have deemed your written thesis defensible. Give your completed, near-final draft of your full thesis to your committee for review at least four weeks before your thesis defense. (4) Submit thesis to the Graduate College's format editor for initial format check at least two weeks prior to your defense. Failure to do this could result in delay of graduation. (5) Pass your thesis defense no later than two weeks before the end of classes (or thesis filing deadline for a Summer graduation date). (6) Submit thesis to the Graduate College's format editor for final format check within two weeks of the end of the semester at the latest. (7) Provide one hard-bound copy of your thesis to SESES. (8) Give the SESES Staff Graduate Program Coordinator and your thesis advisor a “pdf” file of your entire thesis, including appendices. Note: research done while a student at Northern Arizona University is the property of the University and therefore there may be samples or other material that you must arrange to leave with your thesis advisor.

Determine these deadline dates for the semester you plan to graduate and mark them on your calendar. You will see that you must be highly organized during your final semester. The most difficult deadlines for most graduate students to meet are the completion of a defensible written thesis draft four weeks in advance of the defense, and the completion of the thesis for submission to the Graduate College. Remember, you are not working on this alone, and you are relying on the efforts of three other very busy people, your thesis committee. You must discuss your plans with your committee early. Read the guidance given below under "Thesis".

**Summer Thesis Defenses**

NAU faculty members are not under contract during the summer; a summer defense is a favor to you. If you wish to defend in the summer, you must discuss your expected schedule of events with your committee, and they must approve it. Again, the university does not employ faculty
during the summer and many are away at meetings or doing fieldwork supported by research grants. You may not change the members of your committee just to achieve an August graduation.

Many graduate students do not meet the deadlines for spring graduation. If you anticipate that you will not make spring graduation, then file for August initially. It is best if you complete your defense for August graduation prior to the end of spring semester and have a final draft ready for your committee to sign shortly thereafter. If you have applied for spring and miss the deadlines, your graduation date will be moved to August or December and you must pay additional fees. If you defend prior to the first day of summer session, then you are not required to enroll for thesis hours. If the defense occurs on or after the first day of summer session, then you must enroll in at least one thesis hour for the summer session. The Graduate College recommends three (3) hours for enrollment if you use extensive faculty time and university resources associated with the defense. The decision of number of units must be agreed to by your thesis advisor.

PROGRAM OF STUDY
The Program of Study (http://nau.edu/gradcol/degrees-and-programs/programs-of-study-page/) form outlines the courses the student will complete for the M.S. Degree. You are must complete the Program of Study by the end of your second semester. The Program requires that the Faculty Graduate Program Coordinator or your advisor, approve a student's first semester classes before enrollment and that your chosen thesis advisor approve your second semester courses. If there are any questions about courses satisfying Program requirements, contact the Faculty Graduate Coordinator.

Your Program of Study form will not include deficiencies listed at the time of admission, although you must take those classes. A maximum of 8 credit hours of graduate courses completed with a grade of "B" or better may be transferred from other colleges. To receive credits for graduate courses completed at other universities, you must submit a "Petition for Transfer of Credit form" (http://www2.nau.edu/gradcol/Forms/TransferCreditReq.docx) to the Graduate College. Transfer credit approval is not guaranteed and will have to be justified by addressing the criteria established by the Graduate College.

Other than EES 605/606, only graduate courses offered on a letter grade basis will count toward satisfying Program of Study requirements; P/F courses other than EES 605/606 cannot be counted.

Schedule for Completion of M.S. Degree in Two Years

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<tr>
<th>Semester I</th>
<th>Semester II</th>
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<tr>
<td>Nine hours course work (plus EES 605)</td>
<td>Nine hours course work (plus EES 606)</td>
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<tr>
<td>Discussion of thesis topics</td>
<td>Selection of thesis committee</td>
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<td>Selection of thesis supervisor</td>
<td>Approval of thesis proposal by committee</td>
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<tr>
<td>Summer field/lab work</td>
<td>Submission of Program of Study</td>
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<td>(concurrently with thesis proposal)</td>
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or

Field/lab work during first year
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<th>Semester III</th>
<th>Semester IV</th>
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<tr>
<td>Six hours of course work</td>
<td>Thesis research (GLG/ENV 699 ≥ 3 credits)</td>
</tr>
<tr>
<td>Thesis research (GLG/ENV 699 - 3 credits)</td>
<td>Completion and defense of thesis</td>
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**ACADEMIC POLICIES AND SATISFACTORY PROGRESS**

SESES adheres to the academic policies of the Graduate College, and you should be thoroughly familiar with them. In addition, every semester your progress as a graduate student will be evaluated. Our policy on evaluation of your progress and the resulting actions are as follows.

**Academic Standards**

You must maintain a 3.0 grade point average for all courses taken as a graduate student. A grade of D or F does not earn graduate credit. Receiving a grade of C or lower in six or more course units, or a GPA dropping below 3.0, will place a student on academic probation (see NAU Graduate College policy at [https://policy.nau.edu/policy/policy.aspx?num=100407](https://policy.nau.edu/policy/policy.aspx?num=100407) for more information). Only 3 hours of graduate course work with a grade of C can be accepted for the Master's degree program in SESES.

Receiving a grade of C or lower in six or more units of courses during the period of graduate study will result in the loss of any graduate assistantship. A student who is on academic probation is required to meet with her or his advisor to discuss the steps necessary to remediate problems that led to probation and to devise a written action plan. This written action plan must be submitted to the department chair/director and the Graduate College for final approval. If the student cannot then meet the goals for improvement, she/he will likely be dismissed from the Program. In that case a student can apply for re-admission into the Program one time.

Any grade of Incomplete received by a graduate student must be completed within one semester, or the student will be put on probation. If there are extenuating circumstances, an extension could be received in writing from the Faculty Program Coordinator, with approval of the Graduate College.

**Unsatisfactory Progress**

1. The Graduate Committees will periodically review each graduate student. Students will be notified individually regarding any unsatisfactory progress in his/her graduate program.

2. The following areas will be evaluated: completion of course deficiencies, filing of course program and thesis topic with the Graduate College, course grades, thesis work, committee meetings, and, if funded, performance as a Graduate Assistant and/or Research Assistant.

3. If a student is making unsatisfactory progress, he/she likely will be placed on academic probation. The student will be notified of specific problems that must be corrected during the first semester of probation through an Academic Improvement Plan. If these problems are not resolved or if there is further unsatisfactory progress during any subsequent semester, he/she will be placed on a second semester of probation during which time the student is not eligible for an assistantship or scholarship from SESES or university except under rare, exceptional circumstances. If, at the end of that second semester of probation, progress is still unsatisfactory, the student will be dismissed from the program.

4. If a student regards the committee’s decision or treatment as unjust, she/he may request her/his advisor, or the Faculty Program Coordinator, to call a meeting of the faculty. The student
will present a case in writing to the faculty one week prior to the meeting and may choose to be present at the beginning of the meeting for discussion of the situation. The faculty will deliberate the case without the student being present and, within one week, render their decision in writing. If a student does not accept the faculty's findings, a grievance may be pursued through university channels.

**Admissions Contingencies (Conditional Admission to Graduate Study)**

These vary with each student, and many students have no deficiencies. Progress toward completion of courses listed as deficiencies at the time of matriculation should start in the first semester and be continuous.

**Filing of Program of Study and Thesis Topic**

Prior to the beginning of the first semester, a student must meet with the Faculty Graduate Program Coordinator or advisor, to establish an approved outline of first semester courses. Prior to the beginning of the second semester, a student must have second semester courses approved by the thesis advisor. Before the end of the first semester, a student should select a thesis advisor. Before the end of the second semester, the student, in consultation with the advisor, must select a thesis committee and thesis topic. A thesis proposal must be written and approved by the thesis committee during the second semester. The Program of Study is completed during the second semester as discussed above. Please note that a faculty member is not obligated to serve on a specific thesis committee, so it is in the student’s interest to begin the process of selecting a committee as soon as an advisor and general thesis topic has been selected.

**Progress on Thesis**

Students should aim to complete the Masters program within two years of admission to graduate study. Our two-year limit on office space and graduate student funding is a reflection of this two-year program. If working on a thesis, a graduate student should enroll in thesis credit hours that reflect the amount of time the student is working on the thesis project, the use of university facilities, and advisor's time.

Before enrolling for Thesis Research (GLG/ENV 699), the student's advisor must be consulted to determine the amount and type of work expected to be completed for a specified number of credits during any given semester. This should be viewed as a contract, and the advisor will judge each semester whether or not the stated work was completed. If the work was either not completed or was of an unsatisfactory quality, then the student might be placed on probation.

**Committee Meetings**

Students are required to meet with their thesis committees at least once each year. This includes: (1) a meeting during the second semester to discuss the thesis proposal and plan of study prior to advancing to candidacy, and (2) a meeting during the second year to report on progress and to discuss the thesis wrap-up, and (3) a meeting three months prior to the proposed defense date. Depending on the status of the thesis project, meetings 2 and 3 can be the same meeting. At this meeting, the student must demonstrate his/her preparedness to defend the thesis by presenting evidence that the following has been completed or very nearly complete: (1) field and laboratory work (including results from outside sources), (2) data analysis or modeling, (3) formulation of the major conclusions and implications, all of which will be presented to committee, and (4)
completion of all background reading and a preliminary list of references cited. A tentative date for the defense should be discussed at this meeting, along with a schedule for various benchmarks that can be used to track progress. If the student has moved out of Flagstaff, but is still actively pursuing his/her degree, evidence of an internet meeting once a semester must be filed with the Graduate Program Coordinator.

**Continuous Enrollment**
A student must be enrolled continuously in the Program while pursuing a Master's degree. If circumstances require a student to break their time in residence, an application for a one-time exception should be made to the Graduate College. There is a six-year limit for completion of requirements for the M.S. degree.

**THESIS PROPOSAL**
The purpose of the thesis proposal is to help you focus your research ideas, understand the scientific problems that are part of your research program, and think about what methods will help solve the problem you are investigating. The thesis proposal is not a contract, it is a proposal. Your ideas about the research problems and the methods necessary to solve the problem might change as you do the work. You must write the proposal, however, before you begin the work, as an indication to your advisor and committee, you must demonstrate that you are academically ready to undertake independent research.

The selection of the research problem is the responsibility of the individual student in collaboration with a faculty member with whom the student desires to work. Bear in mind that a faculty member may decline to direct any individual's project. A graduate student who has identified a research problem through discussion with an advisor should prepare a research proposal. Students are helped through the initial phases of this project by working closely with an advisor. The proposal will be written as part of EES 606 in the spring semester of the first year and the completed and signed proposal is due to SESES Office and the Graduate Advisor at the end of that semester, and before GLG 699 (thesis credit) hours can be earned. When approved by the committee, the thesis proposal constitutes permission to begin the proposed research.

**Proposal Format**
A thesis proposal should be a **concise** statement of your research problem and how you intend to solve it. It includes a 250-word abstract, approximately 8 - 10 pages of double-spaced text, and supporting maps, graphs, tables, and references. In some cases, with the advisor's discretion, a longer proposal might be necessary. The proposal should be sufficiently well documented with citations from pertinent literature to demonstrate that you are aware of the work of other investigators in the proposed and related fields. Your thesis committee will assist you in writing a concise proposal and will consider the proposal carefully before endorsing it.

**THESIS**
Students are urged to contact the Graduate College when the thesis is about to be written in order to obtain the most current edition of the Graduate College's Format Manual (http://nau.edu/gradcol/student-resources/theses-and-dissertations/). You must follow these guidelines carefully or your thesis might not be accepted by the Graduate College.

You should have extensive discussions with your advisor and possibly your committee
before you begin writing your thesis. Every advisor follows a different procedure depending on
the project undertaken and capabilities of the student. You should write in a style equivalent to
one in a professional journal. The recent theses can be guides, but remember that they are of
variable quality. The advisor should have at least two weeks to read and comment on your work
for each draft. You should be able to expect your advisor to review a chapter of your thesis in 1 –
2 weeks. If you are experiencing longer delays in getting back your edited chapters of your
thesis, you should take action: consult with your thesis advisor; consult with the Faculty
Graduate Program Coordinator, or other thesis committee members to resolve the problem if
you and your advisor cannot come to an agreement on the length of time spent on editing your
thesis. The committee chair might or might not solicit the counsel of other members of the
committee before returning the first draft of the thesis. Remember that faculty members have
other teaching and research commitments and other graduate students. You must be prepared to
make numerous revisions quickly and return the revised drafts to your advisor until you have
achieved a draft that your advisor deems acceptable to be distributed to your committee
members. Note that a poorly written first draft might be returned to the student for rewriting
without your advisor reading the entire thesis.

If after submission of a revised draft it is deemed that the written thesis is satisfactory, it
will be distributed to other members of the committee for their review. The committee should
be given your thesis at least 4 weeks before your defense. Once your committee has read your thesis
that includes nearly final figures, maps, and text, members might suggest major revisions and
wish to see several revised drafts before they agree to approve it as a defensible thesis. Discuss
any suggested revisions with the committee members and with your advisor. At this time it is
advisable to apprise committee members of your progress so they can be aware that they might
soon receive a draft of your thesis; they can outline their time constraints to you (i.e., meetings,
field trips, etc.). If the review is unfavorable, the draft will be returned to the student with the
committee’s written recommendations for further rewriting.

In the event that professional and/or subject-matter disagreement develops within the
thesis committee, the thesis committee chair will have the final decision. If the committee objects
to the action of the thesis committee chair, the member(s) may ask for a review by members of
the Graduate Committee who will attempt to resolve the problem, although the final decision is
still the responsibility of the thesis committee chair. If the member(s) or thesis committee chair is
still unsatisfied, he/she may request to be removed from the committee without prejudice and a
replacement will be made. The purpose of this policy is to prevent the student from being placed
in a difficult situation through no fault of his or her own.

At least two weeks prior to the thesis defense, you must submit your thesis to Graduate
College for format check. This copy should be nearly a final version. The text should be free of
grammatical and typographical errors, and figures and maps should be drafted and in their final
form.

**Timetable for Completion of Thesis in Two Years**

End of second semester in residence: Submit and obtain approval of thesis proposal
Summer between first and second year: Complete field and/or laboratory research
Third Semester: Organize first draft of thesis
Fourth Semester: Submit first draft of thesis before the end of the first week

**Note on Completing Electronic MS Theses**
NAU requires that all MS thesis be submitted electronically. Guidelines are at: http://www2.nau.edu/gradcol/ThesesDiss/ChecklistProperDocumentFormat.pdf. The title page does not have signature lines. It lists the committee members by name. There is a separate Thesis and Dissertation form that committee members will sign, then send to the Graduate College in place of the signed title page.

**TIMELINE FOR FINAL SEMESTER**

**During the Semester Prior to the Intended Defense**
Student must meet with his/her committee during the semester prior to the student’s proposed defense date. The student should present evidence that the following have been completed or very nearly completed: (1) field and laboratory work (including results from outside sources), (2) data analysis or modeling, (3) formulation of the major conclusions and implications, and (4) all background reading. A tentative date for the defense should be discussed at this meeting, along with a schedule for various benchmarks that can be used to track progress.

**No More than Four Weeks Prior to the Defense**
Student will present a completed defense copy of the thesis (including all figures, maps, and references) to the thesis committee for approval to defend. It is expected that each committee member will have read the thesis prior to the committee meeting that will be held no less that two weeks before the tentative defense date (see below).

**No More than Two Weeks Prior to the Defense**
The committee must formally vote whether or not to proceed with the defense. Unanimous committee approval is necessary for the thesis defense to proceed. If approved, the defense is formally scheduled through the Graduate Program Coordinator. This assures that two defenses will not occur at the same time. At least two weeks prior to the defense, you must also submit your thesis to Graduate College for the final format check.

**THESIS DEFENSE**
The thesis defense must occur before the deadline set by the Graduate College, typically 1-2 weeks before finals week, in the semester you wish to graduate. It should not be scheduled during school holidays, weekends, final examination periods, or the summer unless all committee members agree in advance. At a minimum, the main advisor and the student defending the MS thesis, must both be present in person at the MS defense. Other thesis committee members are allowed to attend the meeting from a distance.

The examination shall be scheduled during normal working hours and days, and public announcement of the examination shall be the responsibility of the graduate student. Forward the information to the Graduate Program Coordinator who will make sure that there are not scheduling conflicts. The committee personnel shall not be changed to facilitate scheduling during these periods. It is to your advantage to attend thesis defenses of your colleagues before defending your thesis so that you know what to expect.

The Graduate College has important deadlines for format checks and turning in the final copy. Check with Graduate College for confirmation (http://nau.edu/gradcol/deadlines/). For summer defenses, the final thesis must be turned in to the Graduate College approximately 3 weeks before the fall semester begins – check with the Graduate College for the exact date. If the student has already defended, or will defend prior to the first day of summer session, then the
student is not required to enroll for thesis credit hours. If the defense will occur on or after the first day of summer session, then enrollment in thesis hours is required for the session. If the final thesis copy is not submitted within one year of successful completion of the defense, the student will be required to update and re-defend the thesis.

In detail, the thesis defense consists of two parts: a Formal Oral Presentation and the Final Oral Examination. In the Oral Presentation, the candidate presents, in a professional manner, a summary of the thesis emphasizing the major conclusions of the research. This presentation, typically 30-40 minutes long, is open to a public audience. Following the presentation, the public audience may ask questions related to the thesis. During this time, members of the thesis committee normally refrain from questioning the candidate. At the end of this brief discussion period, the public audience will be excused. At this time the Final Oral Examination begins. The candidate will then be fully examined by the thesis committee. It is during this questioning period that the student must be able to defend the findings and methodology of the thesis and to demonstrate a comprehensive understanding of the geological principles upon which the thesis research was based.

Following the Final Oral Examination, the student will be dismissed, and the examination committee will evaluate the student's performance. Successful completion of the Final Oral Examination shall be by majority vote of the examining committee. The committee will complete and sign the "Report on Final Oral Examination for Masters Degree" and the “Final Oral Examination: Thesis or Dissertation Defense – Part 1”. Should a student fail the Final Oral Examination, the committee chair might reschedule the examination at a later date but no sooner than 30 days. A second failure of the Final Oral Examination will terminate the student's graduate program.

To prepare for this examination, a student is advised to review all graduate course work, all details of the thesis, and all current literature related to the thesis. The committee will be examining to ascertain whether the student has developed a sufficient foundation with both depth in the thesis field and breadth in the degree topic. The student may be called upon to extend his or her knowledge beyond straightforward content knowledge thus testing the use of sound scientific reasoning. You should be in your most alert and educationally honed state to pass your thesis defense.

Successful defense of the thesis research in the Final Oral Examination is likely to be contingent upon completion of additional final changes to your thesis. After these changes have been made, part two of the “Final Oral Examination: Thesis or Dissertation Defense” must be completed and provided to the Graduate College.

Following acceptance of the final version of the thesis, at least one bound copy of the thesis must be ordered for SESES. Many students choose to have more bound copies produced for themselves, their advisor, or others – these are all the student’s decision.