

# ISU Department of Geosciences Graduate Student Handbook



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More information is available at the Department of Geosciences Web Page: <http://geology.isu.edu>

### Disclaimer

This handbook presents information for graduate students in the ISU Department of Geosciences. However, the ISU Graduate Catalog is the only official record of rules and regulations pertaining to graduate education at ISU: <http://www.isu.edu/academic-info/crntgrad/>

## General Information for all Geoscience Graduate Students

**Mission Statement:** We study the landscape, architecture, evolution, and formative processes of Earth and other planets by conducting original investigations, developing new analytical techniques, improving modern geotechnologies, and publishing research papers. In concert with this research agenda, we teach students to become broadly trained earth scientists. Our goal is to develop the analytical and critical thinking skills of students in preparation for the diverse geoscience problems they will encounter beyond ISU. To facilitate this mission, we maintain a collegial atmosphere between students, faculty, and staff.

**Departmental Culture:** The social structure of the department is based upon friendship and respect. Graduate students are an important part of this culture for they bring intelligence, energy, and diversity to a group that places a high value on such traits. Faculty and staff are concerned with more than a student's grade; to better prepare students for professional careers, they encourage a more holistic growth of each student's skills and abilities. Similarly, students are encouraged to contribute to departmental goals in numerous ways beyond the classroom to provide a more productive, successful, and comfortable environment. The result is a dynamic yet informal atmosphere where faculty, staff, and students work closely together in the classroom, lab, office, and field.

**Advising:** The Department has an open door policy with regard to student advising, so that a student can meet with any faculty member to discuss their graduate program. Initially, most students should take the initiative to meet with the Department's Graduate Advisor to discuss classes and graduation requirements. Students should also meet with various faculty to discuss potential research projects. By the end of the second semester you should select the faculty on your thesis committee, and then meet regularly with them to discuss all aspects of their graduate program.

**Enrollment** (Go to the ISU Graduate School Webpage for details: <http://www.isu.edu/graduate/>)

**Credits:** A graduate student who takes 1-8 credits per regular semester (Fall and Spring) is considered a part-time student, while one who takes 9-12 credits is considered full-time.

Enrolling in 13-16 credits per semester is possible, but requires written approval of the Graduate Dean if the student has a teaching assistantship (TA) or research assistantship (RA).

**Continuity and Duration:** A graduate student is required to be enrolled continuously each semester, including summer semesters, or the student must re-apply to Graduate School. A minimum of one summer credit (e.g. G648, G650 or G699) is required for part-time and full-time students. A student has 8 years, starting from graduate matriculation, to complete their graduate degree.

**Grading and GPA Requirements:** All Geoscience courses award letter grades except G591 (Seminar), G597 (Professional Development), G650 (Thesis), and G699 (Dissertation) which award S/U grades. To graduate, a student must compile a cumulative GPA of 3.0 or higher on all graded courses listed on the Graduate Program of Study. Note that a B- grade is insufficient to maintain a 3.0 GPA, and a grade of C+ or lower is considered failing at the graduate level. Although such grades can be balanced by earning high grades in other courses, successful graduate students will maintain a GPA well above the required minimum.

**Deficiencies:** A student may be admitted into the Department with "deficiencies", which are one or more undergraduate courses that must be completed prior to completion of the graduate degree. Deficient courses are typically taken at the undergraduate level and do not count toward the graduate degree program. However, if one (and only one) deficient course is also offered at the graduate level, it may be taken at the graduate level and counted toward the graduate degree program.

**Satisfactory progress:** The Geosciences faculty meet at the end of each semester to evaluate the progress of each graduate student. Typically, the progress of most students is deemed satisfactory but occasionally some are found to have low grades, inadequate TA or RA reviews,

or little progress on thesis research. In these situations, the faculty will suggest potential solutions to the problem and communicate these to the student. In some cases, the student will be given a deadline to complete certain academic or work milestones. Lack of performance may induce the faculty to withdraw funding or dismiss the student from the graduate program.

#### Departmental Guidelines:

The positive collegial atmosphere of our department requires all students and faculty to maintain a high degree of personal and professional responsibility. So please follow these guidelines: Show respect for others. Clean up after yourself. Do not plagiarize. Get trained before using technical equipment. Leave a written record when you borrow maps, theses, and equipment. Lock the computer and research labs when you leave. Get an ISU email account so we can always communicate with one another. Attend Colloquium every week. Willingly offer your help to other students, faculty, and staff. Obey traffic laws in university vehicles. Get regular sleep and exercise.

#### Departmental Facilities:

##### (1) Pocatello Campus

**Offices:** Graduate students are assigned space in a furnished office as long as such space is available. They are given a key and can access their office at any time. Students are responsible for the safety and security of items left in their offices.

**Classrooms:** These rooms are primarily designed for formal lectures and laboratory sessions. At any other time, these rooms can be used for meetings and general study purposes. Each is equipped with a ceiling-mounted LCD projector and computer connections.

**Research Laboratories:** These rooms are primarily designed to house active research projects. Students should consult with the supervising faculty of each lab before using the room for any research purpose. Formal training is often required before using the room or its equipment.

##### Computers:

**Addresses and Passwords:** Each student receives an ISU email address that should be used for all professional communications. It is critical to use your ISU email address (typically formed with the first 4 letters of your last name followed by the first four letters of your first name) so that you receive all university, departmental, and course related announcements. Each student also receives a departmental username and password for accessing departmental servers.

**Connectivity:** The Geology building has 10 MB hard wire connection in each classroom, labroom, and faculty office, and a rather weak wireless system called EDUWIFI.

**Labs:** The department has two computer labs, both accessed by key or keycode. One is the teaching lab which, when not in use as a classroom, should be used for all word processing, email, and Internet use. The other is the Digital Mapping Lab which is used for research and graphic production. DML protocols are listed in the lab and include such things as: 1) no food, drink, or dogs in the lab, 2) proper storage of personal files on the correct server/drive, and 3) minimal waste of paper when printing hard copies.

**Personal Computers:** Personal Computers can be used anywhere in the department. To have wireless internet access through EDUWIFI, each student will need an access code and must pay \$25/semester to the ISU Computer Center. To register your personal laptop to work with the wireless system you will need to contact the ISU computer help desk (282-HELP).

##### (2) Idaho Falls Campus

**Overview:** Many Geosciences courses are offered at the ISU-Idaho Falls campus. The Department maintains an active presence in Idaho Falls through distance learning and on-site courses at the undergraduate and graduate level. The MS GISci is offered in full in Idaho Falls, though it is often preferable or necessary to take one or more class in Pocatello or via distance learning. The ISU-IF campus is also associated with University of Idaho, and many U of I courses can be taken as electives in ISU graduate programs.

**Geospatial Software Lab:** The Geospatial Software Lab (GSL) is the largest non-nuclear ISU research lab in Idaho Falls and is located on the second floor of the Center for Advanced Energy Studies (CAES) on University Blvd. The GSL includes research space for several graduate and undergraduate students in a state-of-the-art research facility that is shared with University of Idaho, Boise State University, and Idaho National Lab researchers working on a variety of energy related research activities.

**GIS Computer Lab:** TAB 135b is home to the Idaho Falls Geosciences GIS Computer Lab. This lab is used to deliver geotechnologies courses and is accessible for research and other use when classes are not in session. This room includes distance learning equipment used to receive and deliver courses between Idaho Falls, Boise, and Pocatello.

**Other Idaho Falls Resources:** The ISU-IF campus has many resources available to students including career counseling, English training, a small library and bookstore, a cafeteria, and a student services office for all course registration and related needs. There is presently no student housing available at the Idaho Falls campus, hence students who chose to live and study in Idaho Falls typically find apartments and shared houses in the community in which to live. Owning a car is a necessity in Idaho Falls as there is very limited public transportation. A bus service to Pocatello runs daily during regular academic semesters.

### (3) Boise Campus

**Overview:** ISU's main Boise campus with full student services is located in west Boise.

However, the Department of Geosciences is primarily located in the Boise Center Aerospace Laboratory (BCAL), which is within the Idaho Water Center. Parking at the Idaho Water Center is pay by-the-hour in the garage or free after 6 PM. Students will need to obtain a keycard for access to the building after hours.

Many Geosciences courses are offered in Boise. The Department maintains an active presence in Boise through distance learning and on-site courses at the undergraduate and graduate level. The MS GISci is offered in full in Boise, by taking classes via distance learning and on-site at the Idaho Water Center (BCAL) and the ISU-Boise main campus. Students can also take courses from U of I (in the Idaho Water Center) and BSU, as electives in ISU graduate programs.

**Boise Center Aerospace Lab (BCAL):** BCAL is primarily a research facility in Boise and is located in the Idaho Water Center, suite 240. BCAL includes 4 offices, storage area, and a computer lab. BCAL is co-located with the University of Idaho, USFS Rocky Mountain Research Station, IDWR, and CH2M Hill in the Idaho Water Center. Students have the opportunity to interface with scientists from all of these entities. The latter two have provided employment opportunities to students in the past.

**BCAL Computer Lab:** Suite 236 is the BCAL lab used to deliver geotechnologies courses and is accessible for research and other use when classes and meetings are not in session. This room includes distance learning equipment used to receive and deliver courses and facilitate meetings between Idaho Falls and Pocatello. Students may use the facility to communicate with committee members and other faculty, staff, and students in other locations. Wireless internet is not available but ethernet lines are.

**Other Boise Resources:** The main ISU-Boise campus has many resources available to students including a new student orientation, counseling, library, computer labs, wireless internet and a student services office for all course registration and related needs. ISU-Boise has an agreement with BSU for students to use BSU's library and health services. There is no ISU student housing available but there are many apartment-style living opportunities within walking distance to BCAL.

## ISU beyond Geosciences:

**Classes:** ISU is a large university with seven colleges that offer classes in most academic disciplines. You are encouraged to take advantage of the university offerings by occasionally enrolling in classes beyond Geosciences. For many of you, this is your last opportunity to take classes before your student career ends.

**Health Services:** Full- and part-time students qualify for free or reduced-cost health care at ISU facilities including (on the Pocatello Campus):

- ISU Health Center - free office calls, reduced-cost prescription drugs, x-rays, lab work
- Student Pharmacy - a second source of reduced cost prescription drugs.
- Dental Hygiene Clinic - free cleaning by students-in-training
- Physical & Occupational Therapy - reduced-cost PT services
- ISU Wellness Center - free fitness center, classes, and evaluations
- Anderson Resource Center - free gender-based education and services

**Counseling:** A graduate program requires significant time and energy to complete. Because of this, many students find it difficult to remain stress-free throughout their graduate studies, particularly when personal, family, or work issues intervene. To help with psychological, emotional, and interpersonal stress, ISU offers a free counseling service for graduate students. Contact the ISU Counseling and Testing Center (282-2130) to make an appointment.

**Entertainment:** ISU offers a full range of entertainment options for all students. Clubs, concerts, movies, athletic events, dinners, and other activities are advertised throughout the university.

**Recreation:** ISU also offers a full range of recreation opportunities for all students. The Geosciences department often sponsors intramural teams (though lately we've suffered too many injuries to justify the effort). Reed Gym has a pool, climbing wall, several gyms, tennis courts, racquetball courts, and a number of other facilities. The Wilderness Rental Center provides equipment for outdoor activities that range from skiing to camping to kayaking. They also supervise a winter Yurt system in the mountains surrounding Pocatello. The Outdoor Adventure Center offers a full range of organized recreational trips for climbing, mountaineering, bicycling, skiing, camping, kayaking, rafting, and most other outdoor adventures. Overall, few schools in America can match ISU's support of outdoor recreation.

**Financial Aid:** Graduate Assistantships (TA and RA) are designed to support students during the 9 month school year. Other forms of aid can provide partial support during the school year or partial to complete support of research expenses. Summer support typically doesn't accompany a TA award but may accompany an RA. The latter is dependent upon available funding and summer research activities.

**Teaching Assistantship:** The department has 5 TAs to award each semester. The work involves teaching laboratory sections of undergraduate classes, either alone (G1xx classes) or with the assistance of a faculty member. A typical assignment is 3 labs per semester. In return, the TA receives full tuition, graduate student fees, health insurance, and a stipend sufficient to cover room, board, and living expenses. Note that individual course fees and books are not covered.

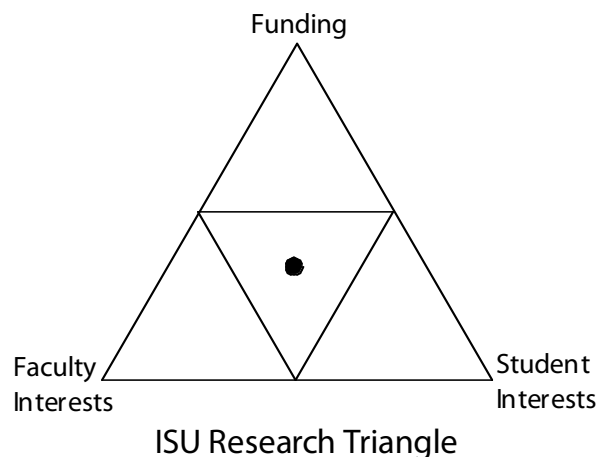
**Research Assistantship:** Individual faculty members receive funding for RAs by writing successful grant proposals to external funding agencies. The number of RAs varies from 5-15 each year depending upon funding. The work may involve assisting a faculty member on their research or it may be entirely directed toward completing the student's own research project. The RA is expected to devote 19 hours per week to the work. In return, the RA receives full tuition, student fees, health insurance, and a stipend sufficient to cover room, board, and living expenses. Note that individual course fees and books are not covered.

**Research Funding:** Certain grants may be obtained to fund specific research tasks. Typical budget categories are salary, fringe, travel, per diem, lab expenses, capital outlay, and indirect costs. Once budgeted into a certain category, the funds must generally be used for these purposes.

Work-Study: If a student qualifies for federally-subsidized work-study funds, the department will employ the student to complete tasks such as maintaining equipment, organizing labs, or cataloging reference materials. Students receive an hourly wage.

### Seven Clues to a Smooth Graduate Experience

- 1) Hang loose at the start. You may need a semester or more to decide on your thesis topic and your advisor. Don't feel locked in if your interests change. This happens.
- 2) Smell the daisies during your time here. Take a broad selection of classes and try to get one from each professor. This may be your last chance to study something that interests you, but is not in your specialty area of Geoscience
- 3) Go to Colloquium regularly. It's where the Department communicates each week.
- 4) Once you decide on an advisor, meet with them on a regular basis... weekly or biweekly. This is especially true in the year that you are writing your thesis.
- 5) Meet with your Graduate Committee at least once each semester. This helps with communication on your prospectus and the scope of your thesis.
- 6) It will take a full semester to write your thesis, get the comments back and get your thesis revised. Those who think they can move faster than this are usually wrong, and frustrated. The key is to deliver written documents early and often. The other side of the coin is to demand prompt turn around of your written documents from your advisor and your committee. If this does not happen, find out why and work together to get the situation fixed.
- 7) Earn A's and B's in your classes. A B- is insufficient, and a grade of C in a graduate course is a red flag that causes faculty concern and will stand in your way moving through the program. You must have a cumulative GPA of 3.0 to retain your funding and, ultimately, to graduate.



## **Engineering and Applied Sciences Ph.D. Program**

(Note - Official Guidelines for this degree are maintained by the College of Engineering)

(Go to <http://engr.isu.edu/pages/graduate-programs/> for more information)

**Overview:** This degree offers Geosciences students an opportunity to obtain a PhD in an interdisciplinary program with a focus area specific to the individual student. Geosciences students can focus on a variety of research topics in this degree program including environmental sciences, water resources and hydrology, remote sensing, geotechnologies, geomorphology, etc.

**Required Credits:** 54 graduate credits for students who possess an MS degree.

**Required Courses:** Eighteen (18) credits should be earned in graded classes, of which at least nine (9) should be in areas outside the main research area. These credits can be 5xx or 6xx level. A minimum of four (4) Seminar (Gxxx) credits is required. The remaining credits (~32) may be Dissertation (G699) credits. G699 may not be taken until the student has passed the Comprehensive Examination.

**Comprehensive Examination:** This exam is generally administered in the 3<sup>rd</sup> semester. It consists of two (2) four-hour exams taken on successive days. The exam is prepared by the Advisory Committee (with assistance from other instructors as needed) and consists of questions related to subject matter the student has covered in recent courses. See the E&AS PhD Handbook for details.

**Research Proposal:** Within 6 months of completing the Comprehensive Exam, the student must complete an oral presentation and oral examination of the Research Proposal. The Dissertation Committee administers the exam. The oral presentation is one opportunity to present your work at the department colloquium.

**Dissertation:** Each student is required to complete an original research project, submit the results in writing, and successfully defend it in an oral examination.

**Research:** Each student will devote considerable time to the actual research project. Each project usually involves data collection, analysis, and interpretation. With guidance from the faculty advisor(s), the student should progress through these stages to develop a result that makes a significant, original contribution to the general knowledge in that scientific discipline.

**Writing:** The written dissertation is a detailed description of the research project. It includes several chapters that describe the research objectives, previous work, research methods, results, interpretation of results, and references. Alternatively, the dissertation may include 3 or more published papers combined with ancillary materials. The format of the dissertation should be discussed with your advisor – note that ISU has some specific requirements regarding the format of the final, bound version. Preliminary drafts of the dissertation should be submitted to the advisor(s) for critical review and then returned to the student for corrections. A nearly final version of the dissertation must be delivered to each member of the dissertation committee at least 2 weeks prior to the oral examination. Final corrections to the dissertation will be made after the oral exam. Once the final dissertation is mailed to the binder, the student has formally completed this task.

**Oral Examination:** An oral examination must be successfully completed by each student. The exam begins with a 15-30 minute formal presentation of the research project, followed by questions from the assembled faculty. The exam will normally focus on the research contained in the thesis, but examiners may ask questions on any related subject. Any Graduate Faculty member may attend the exam and ask questions. Whether the student passes the exam is determined by members of the dissertation committee, including the GFR, who vote at the end of the exam.

Archive: The final written dissertation including all figures and plates should be copied to a digital CD or DVD and submitted to the lead advisor and Digital Mapping Laboratory (DML) for archival storage in the Department of Geosciences.

Publication: Each student should disseminate the results of their research by (1) presenting the results in oral or poster format at regional or national conferences, and (2) submitting papers for publication in a peer-reviewed national or international journal. Such presentations and publications allow a large community of scholars to become familiar with the research, leading to improvements in the research itself as well as additional professional opportunities after graduation. Publication is normally done in collaboration with other members of the research group.

Suggested Timeline for Engineering and Applied Sciences PhD Degree:

Semester 1 (Fall):

Classes: 5xx and 6xx-level classes (9 credits)

Research: Discuss research opportunities with faculty members

Committees: Form Advisory Committee

Paperwork: Submit EAS-1 (Doctoral Study Plan) and EAS-2 (Advisory Committee)

Semester 2 (Spring):

Classes: 5xx and 6xx-level classes (9 credits)

Research: Select thesis research topic. Identify funding options.

Committees: Meet with Advisory Committee

Summer

Classes: G699 (1 credit)

Research: Data collection and analysis in field or laboratory; Prepare for Comprehensive Exam

Semester 3 (Fall):

Classes: G6xx (1 credit) and G699 (8 credits)

Research: Field/laboratory data collection and analysis.

Examinations: Comprehensive Examination (3<sup>rd</sup> Th/F in October)

Committees: Meet with Advisory Committee. After CE, form Dissertation Committee

Paperwork: Submit EAS-3 (Report on CE) and EAS-4 (Dissertation Committee)

Semester 4 (Spring):

Classes: G6xx (1 credit) and G699 (8 credits)

Research: Field/laboratory data collection and analysis. Conference presentations.

Examination: Research Proposal presentation and examination

Paperwork: Submit EAS-5 (Outcome of Research Proposal)

Summer

Classes: G699 (1 credit)

Research: Data collection and analysis in field or laboratory

Semester 5 (Fall):

Classes: G6xx (1 credit) and G699 (8 credits)

Research: Final field/laboratory data analysis. Conference presentations.

Semester 6 (Spring):

Classes: G6xx (1 credit) and G699 (8 credits)

Research: Write dissertation.

Defense: Public Presentation and Oral Examination of Dissertation

Paperwork: File for Graduation.

## MS in Geology Program

**Required Credits:** 30 graduate level credits. At least 17 of the 30 credits must be G6xx-level courses. No more than 6 of the G6xx credits may be G650 (Thesis). The remaining 13 credits may be 5xx or 6xx-level classes, and may include up to 8 graduate credits from other departments. In addition to the 30 credits, each student must complete two classes (approved by the advisor) outside the Geosciences Department.

**Required Courses:** G591 (Seminar), G601 (Advanced Physical Geology), G603 (Geologic Writing Seminar). A student may not enroll in G650 (Thesis) until a thesis prospectus is completed and signed by their advisors.

**Required Presentation:** Each student is required to present the results of their research at a department colloquium before graduation.

**Thesis:** Each student is required to complete an original research project, submit the results in writing, and successfully defend it in an oral examination.

**Committee:** After discussing research opportunities with various faculty members, each student should select a research problem and form a thesis committee of faculty advisors. Two research advisors and a Graduate Faculty Representative (GFR) are normally chosen though others may be selected. At least two advisors should be Graduate Faculty in the Department of Geosciences. The Graduate Faculty Representative (GFR) is an ISU faculty member (with Graduate Faculty status) beyond the Department of Geosciences; this person may join at the beginning or end of the research project. Each student should meet regularly with their research advisors; we suggest weekly to biweekly with the main advisor and monthly to bimonthly with the thesis committee.

**Prospectus:** Each student will write a 10-page summary of the proposed research that describes the problem, its significance, previous work, methodology, logistics, and anticipated outcomes. This prospectus is normally completed in semester 2 as part of G603 (Geologic Writing Seminar). The prospectus should be approved by the research advisors before the actual research commences and thesis credits are taken.

**Research:** Each student will devote considerable time to the actual research project. Each project usually involves varying proportions of data collection, analysis, and interpretation. With guidance from the faculty advisor(s), the student should progress through these stages to develop a result that makes a significant, original contribution to the general knowledge in that scientific discipline.

**Writing:** The written thesis is a detailed description of the research project. It includes several chapters that describe the research objectives, previous work, research methods, results, interpretation of results, and references. Alternatively, the thesis may include 1 or more published papers combined with ancillary materials. The format of the thesis should be discussed with your advisor – note that the ISU Graduate School has some specific requirements regarding the format of the final, bound version. Preliminary drafts of the thesis should be submitted to the advisor(s) for critical review and then returned to the student for corrections. A nearly final version of the thesis must be delivered to each member of the thesis committee at least 2 weeks prior to the oral examination. Final corrections to the thesis will be made after the oral exam. Once the final thesis is mailed to the binder, the student has formally completed this task.

**Oral Examination:** An oral examination must be successfully completed by each student. The exam begins with a 15-30 minute formal presentation of the research project, followed by questions from the assembled faculty. The exam will normally focus on the research contained in the

thesis, but examiners may ask questions on any related subject. Any Graduate Faculty member may attend the exam and ask questions. Whether the student passes the exam is determined by members of the thesis committee, including the GFR, who vote at the conclusion of the exam.

Archive: The final written thesis including all figures and plates should be copied to a digital CD or DVD and submitted to the lead advisor and DML for archival storage in the Department of Geosciences.

Publication: Each student is strongly encouraged to disseminate the results of their research by (1) presenting the results in oral or poster format at regional or national conferences, or (2) submitting a paper for publication in a peer-reviewed national or international journal. Such presentations and publications allow a large community of scholars to become familiar with the research, leading to improvements in the research itself as well as additional professional opportunities after graduation. Publication is normally done in collaboration with other members of the research group, including advisors who can facilitate the process.

#### Suggested Timeline for MS Geology Degree:

##### Semester 1 (Fall):

Classes: G599, G601, deficiencies, other 5xx and 6xx-level classes

Research: Discuss research opportunities with faculty members

Paperwork: Submit a Preliminary Program of Study

##### Semester 2 (Spring):

Classes: G603, deficiencies, other 5xx and 6xx-level classes

Research: Select thesis research topic. Write thesis prospectus. Identify funding options

##### Summer

Classes: Gxxx (at least 1 credit)

Research: Data collection and analysis in field or laboratory

##### Semester 3 (Fall):

Classes: 5xx and 6xx-level classes, possibly including G650

Research: Final field/laboratory data collection. Data analysis. Conference presentations.

##### Semester 4 (Spring):

Classes: G650 and minimal 5xx or 6xx-level classes.

Presentation: Present research results at department colloquium.

Research: Final data analysis. Write thesis. Oral Defense of thesis.

Paperwork: File for Graduation. Complete Final Program of Study.

## **MS in Geographic Information Sciences Program**

**Required Credits:** 30 graduate level credits. At least 9 of the 30 credits must be G6xx-level courses. 6 credits of thesis G650 are also required. The remaining credits may be 5xx or 6xx-level classes.

**Required Courses:** Specific required core classes include G509 (Remote Sensing), G504 (Advanced GIS), G507 (GPS Applications in Research), G508 (Geotechnology Seminar), and one credit of seminar in specific topical area (Geology, Biology, Anthropology, History, Computer Science, or Engineering). A student may not enroll in G650 (Thesis) until a thesis prospectus is completed and signed by their advisors.

**Required Presentation:** Each student is required to present the results of their research at a department colloquium before graduation.

**Thesis:** Each student is required to complete an original research project, submit the results in writing, and successfully defend it in an oral examination.

**Committee:** Typically graduate students are admitted to this program after already identifying an appropriate faculty member graduate advisor and research topic. Students form a thesis committee of three faculty members. Two research advisors and a Graduate Faculty Representative (GFR) are normally chosen though others may be selected. At least two advisors should be Graduate Faculty in the Department of Geosciences. The Graduate Faculty Representative (GFR) is an ISU faculty member (with Graduate Faculty status) beyond the Department of Geosciences; this person may join at the beginning or end of the research project. Each student should meet regularly with their research advisors; we suggest weekly to biweekly with the main advisor and monthly to bimonthly with the thesis committee.

**Prospectus:** Each student will write a 10+ page summary of the proposed research that describes the problem, its significance, previous work, methodology, logistics, and anticipated outcomes. This prospectus is normally completed in semester 2. The prospectus should be approved by the research advisors before the actual research commences and must be approved before the student may register for thesis credits.

**Research:** Each student will devote considerable time to the actual research project. Each project usually involves varying proportions of data collection, analysis, and interpretation. With guidance from the faculty advisor(s), the student should progress through these stages to develop a result that makes a significant, original contribution to the general knowledge in that scientific discipline.

**Writing:** The written thesis is a detailed description of the research project. It includes several chapters that describe the research objectives, previous work, research methods, results, interpretation of results, and references. Alternatively, the thesis may include 1 or more published papers combined with ancillary materials. The format of the thesis is available from your advisor – note that the ISU Graduate School has some specific requirements regarding the format of the final, bound version. Preliminary drafts of the thesis should be submitted to the advisor(s) for critical review and then returned to the student for corrections. A nearly final version of the thesis must be delivered to each member of the thesis committee at least 2 weeks prior to the oral examination. Final corrections to the thesis will be made after the oral exam. Note these corrections may take students a considerable amount of time. Once the final thesis is mailed to the binder, the student has formally completed this task.

**Oral Examination:** An oral examination must be successfully completed by each student. The exam begins with a 15-30 minute formal presentation of the research project, followed by questions from the assembled faculty. The exam will normally focus on the research contained in the thesis, but examiners may ask questions on any related subject. Any Graduate Faculty member

may attend the exam and ask questions. Whether the student passes the exam is determined by members of the thesis committee, including the GFR, who vote at the conclusion of the exam.

Archive: The final written thesis including all figures and plates should be copied to a digital CD or DVD and submitted to the lead advisor and DML for archival storage in the Department of Geosciences.

Publication: Each student is strongly encouraged to disseminate the results of their research by (1) presenting the results in oral or poster format at regional or national conferences, and/or (2) submitting a paper for publication in a peer-reviewed national or international journal. Such presentations and publications allow a large community of scholars to become familiar with the research, leading to improvements in the research itself as well as additional professional opportunities after graduation. Publication is normally done in collaboration with other members of the research group, including advisors who can facilitate the process.

#### Suggested Timeline for MS GISci Degree

##### Semester 1 (Fall):

Classes: G503, G508, deficiencies, discipline specific seminar, other 5xx and 6xx-level classes

Research: Discuss research opportunities with faculty members

Paperwork: Submit a Preliminary Program of Study

##### Semester 2 (Spring):

Classes: G504, G509, G507, deficiencies, other 5xx and 6xx-level classes

Research: Select thesis research topic. Write thesis prospectus. Identify funding options

##### Summer

Classes: Gxxx (at least 1 credit)

Research: Data collection and analysis in field or laboratory

##### Semester 3 (Fall):

Classes: 5xx and 6xx-level classes, possibly including G650

Research: Final field/laboratory data collection. Data analysis. Conference presentations.

##### Semester 4 (Spring):

Classes: G650 and minimal 5xx or 6xx-level classes.

Presentation: Present research results at department colloquium.

Research: Final data analysis. Write thesis. Oral Defense of thesis.

Paperwork: File for Graduation. Complete Final Program of Study.

## Master of Natural Sciences Program

**Required Credits:** 30 credits at the 5xx or 6xx-level in Geology, Physics, Chemistry, or Biology. In addition, each student must possess a secondary school Teaching Certificate or complete 12-19 credits, including student teaching, in the College of Education to obtain a Teaching Certificate.

**Required Courses:** None for the 30 credits of graduate work, though courses must be approved by the student's advisory committee and the Dean of Graduate Studies. Students who need to obtain a Teaching Certificate should consult the ISU catalog and College of Education to identify the required courses.

**Recommended Courses:** G510 (Science in American Society), G571 (Historical Geography of Idaho), G591 (Seminar), G601 (Advanced Physical Geology)

**Thesis:** No

**Written Exam:** In the student's final semester, a written exam must be taken and passed. The exam will be written by the advisory committee (with assistance from other instructors if necessary). The content of the exam will reflect the graduate courses taken by the student.

**Oral Exam:** Two weeks after the written exam, the student must take and pass an oral examination administered by the advisory committee. The student will be asked to correct and expand upon the answers provided in the written exam.

### Suggested Timeline for MNS Geology Degree

Semester 1 (Fall):

Classes: G599, G601, deficiencies, other 5xx and 6xx-level classes, Education classes

Semester 2 (Spring):

Classes: Deficiencies, other 5xx and 6xx-level classes, Education classes

Semester 3 (Fall):

Classes: 5xx and 6xx-level classes, Education classes

Semester 4 (Spring):

Classes: 5xx or 6xx-level classes, Education classes

## Post-Baccalaureate Certificate in GIS

Required Credits: 19 graduate level credits

Required Courses: Specific required core classes include G503 (Principles of GIS), G509 (Remote Sensing), G504 (Advanced GIS), G507 (GPS Applications in Research), G508 (Geotechnology Seminar), one credit of seminar in specific topical area (Geology, Biology, Anthropology, History, Computer Science, or Engineering), and four credits of technical electives (G5xx or G6xx).

Thesis: none

### Suggested Timeline for MS Geology Degree

#### Semester 1 (Fall):

Classes: G503, G504, G508, other 5xx and 6xx-level classes

Paperwork: Submit a Preliminary Program of Study

#### Semester 2 (Spring):

Classes: G504, G509, G507, other 5xx and 6xx-level classes

Paperwork: File for Graduation. Complete Final Program of Study.

## Eleven Steps to Graduation

### One semester prior to Graduation

- 1) Submit final Program of Study to Graduate School, The program of study lists the classes you have taken (and will take in your final semester), and is the official count of graduate credits toward graduation. This document is approved by the advisor, chair, and graduate dean. It is important to file the program of study before the final semester begins so you know exactly what you need to take, and so that you don't have any surprises when it's too late. It also lists your committee, including your GFR, who should be chosen in consultation with your department committee.
- 2) Write a chapter or two of your thesis or dissertation. Your first two chapters can typically be derived in part from your prospectus, and having them done this semester makes your final semester far easier.
- 3) You should be done with your data collection and analysis by the end of this semester. If you aren't, chances are you won't finish next semester. There's just too much else to do.

### Semester of Graduation

- 4) Within the first 2 weeks of the semester - complete the online Application to Graduate and submit to the Graduate School.
- 5) By the end of the semester - Pay \$20 to the Graduate School.
- 6) During the semester - Write early and often. Don't delay your writing because it will probably take longer than you think. Start passing chapter drafts through your advisor, and when they are in good shape pass them through the rest of your committee. It is far better to get your entire committee's input early in the process rather than waiting for the defense draft. If you don't get input until your defense, it can lead to pitfalls at the end.
- 7) During the semester - Work toward a defensible draft of your thesis/dissertation. In some cases, three or four drafts precede the defense draft. Don't count on your first or second draft being your defense draft. *Your entire committee should be involved in deciding that the thesis is ready for defense, not just your advisor.* Your defense draft should look like your final thesis, with all the required lead-in pages. See the Graduate School rules at <http://www.isu.edu/graduate/graduation.shtml>
- 8) Once you have a defense draft approved by your committee, schedule your defense. Your defense must be at least two weeks before the end of the semester. Once you've found an amenable time, tell Michele so that she can notify the Graduate School and the committee.
- 8) No later than 2 weeks prior to oral examination - Submit defensible draft of thesis or dissertation to thesis committee. Your entire committee should have seen at least one previous draft by this time, so they should know what's coming and you should know what they're thinking.
- 9) No later than 2 weeks prior to end of semester - Oral examination of thesis or dissertation research. The student begins the examination with a 20 minute public presentation of research, followed by a 1-2 hour closed discussion with committee members and any ISU Graduate Faculty. Wow your committee with all your knowledge and the quality of your work. Questioning typically revolves around the thesis project and related topics, but keep in mind that this is a final oral exam for your degree and that your committee can ask you anything!
- 10) Within 2 weeks after the oral examination - Complete final revisions of thesis or dissertation. Relax for 22 hours after your defense, but then get to work! Address the comments and recommendations from your committee and submit a final draft for their review. When they all approve, have each member sign the signature sheets. Make a digital copy of entire thesis or dissertation and submit to ISU Geosciences. Make multiple (minimum of 4) hard copies of thesis or dissertation and ship to bindery. Complete Thesis/Dissertation Clearance and submit it to the Graduate School.
- 11) Relax after a job well done. Get a job... travel the world... use your degree in creative ways.