INTRODUCTION

This Handbook presents information and resources for graduate study in the Department of Geology and Geological Engineering and is intended to ease your transition into the Department and your life as a graduate student. This Handbook supplements and is subordinate to regulations in the *Bulletin* of Colorado School of Mines. It is the responsibility of each graduate student to read and understand information pertaining to graduate study in both this Handbook and the *Bulletin*. Members of the faculty, the Department assistants, or other graduate students can generally answer questions regarding the Handbook and the *Bulletin*.

Departmental focus areas include energy and minerals resources, hydrology, engineering geology/geotechnics, geochemistry, basic geosciences, and related new fields of endeavor.

MISSION STATEMENT

The Mission of the Department is to:

1) integrate basic and applied research in educating undergraduate and graduate students with the knowledge and skills needed for leadership across disciplines in a professional career in the earth sciences and geological engineering;

2) deliver degrees in the earth sciences (graduate) and geological engineering (undergraduate and graduate);

3) conduct world-class research in the earth sciences and geological engineering, with a focus on applied problems; and

4) provide service and leadership toward local, regional, and global stewardship of the Earth.

VISION STATEMENT

Our goal is to be a world-renowned applied geoscience/geoengineering department. This will be measured by the strength of our undergraduate and graduate enrollment; by demand for our graduates in industry, government, and academia; and by strong, sustained financial support and recognition of research.

PROFILE OF DEPARTMENT

The Department of Geology and Geological Engineering emphasizes the study of science and engineering and the application of that knowledge to the solution of resource exploration and development, engineering and environmental problems. Graduate degrees are offered in Geological Engineering, Geology, Geochemistry, and Hydrology. The programs are broad enough to prepare graduates for a wide variety of careers in academic, research, or industrial organizations. The faculty is composed of full-time and adjunct geologists and engineers. Currently there are approximately 154 undergraduate students and 196 graduate students in the Department programs.
COLORADO RESIDENCY

All non-residents of Colorado who are U.S. citizens are strongly advised to begin to establish Colorado residency before they begin their first semester of study at CSM. The greatest advantage to establishing Colorado residency is a reduction in tuition. To qualify for residency a student must prove that they have lived in Colorado for one year or more immediately preceding the first day of classes for the semester in which resident status is sought. Important steps in establishing Colorado residency are obtaining a Colorado driver’s license, transferring motor vehicle and voter registration to Colorado, and rent receipts before the first day of classes the first year. Employment and payment of state income taxes are additional but not essential criteria. There are no absolute requirements for establishing resident status. The Registrar considers cases on an individual basis. For additional information on establishing in-state residency consult the “In-State Tuition Classification Status” section in the Bulletin.

FINANCIAL ASSISTANCE

The Department and CSM have designated funds for the support of Teaching Assistants, scholarships, and fellowships for graduate study. If you did not receive a financial aid offer at admission, there are also numerous sources of funding outside the school, which students are strongly encouraged to seek. You can obtain assistance from posted notices of funding opportunities, Office of the Dean of Graduate Studies, and Department faculty members. Evidence that you have attempted to solve your financial needs through application for outside grants will be considered in evaluating future requests for department funds. Financial support is also available for graduate students through the School’s Financial Aid Office. The American Association of Petroleum Geologists, American Association of University Women, Colorado Scientific Society, Geological Society of America, Sigma Xi, and Society of Economic Geologists may have grant opportunities.

AFFIRMATIVE ACTION

DEPARTMENTAL INFORMATION

Office Personnel
The office staff are here to help, so please feel free to stop by the main office if you need assistance. A brief description of their duties and some procedures are listed below.

Debbie Cockburn
1. Departmental accounting
2. Department Head’s correspondence, telephone calls, appointments
3. Purchasing
4. Assists students, professors, other academic and support departments, and administration
5. Equipment check out (LCD projector, laptop)
6. Student employment contracts
7. Department Newsletter

Summer Jackson
1. Provides information about the Department and school via telephone, email, and public contact.
2. Assists students, general public, professors, other academic and support departments, and administration
3. Handles all materials and items relating to:
   • drop/add forms
   • grade change forms
   • advisors
   • maintaining student files
   • assigning office space
   • building and room access
4. Processes thesis defense notices and forms
5. Assigns rooms for thesis defense
6. Van Tuyl Lecture logistics: schedules speakers, makes their travel arrangements, prepares and circulates notices, organizes refreshments.

Supplies/Coping for TAs
1. TAs have use of supplies such as transparencies, pens, pencils, etc., for use in classes they TA only. The Department does not supply any materials needed for personal use.
2. The majority of class material needing to be reproduced is sent to the CSM Copy Service. Turn around time is usually one day. Please see office personnel for proper paperwork and times for submission of materials.

Spending Money
You, as a student, should NEVER spend your own money to purchase something that your advisor says will be paid for with school money. You should never buy anything, order work to be done, or promise payment without getting a form from Debbie (or Summer). The State can refuse to reimburse you if you did not follow State purchasing rules! Please talk with Debbie first.

1. Travel - The school has procedures for traveling as a student at CSM. It is important that you understand them and comply with them. ALL trips require the Travel
Authorization form (TA) to be submitted PRIOR to the trip. This is your authorization to go on the trip, use school funds, and put the school on notice that you are traveling on school business. If something were to happen to you while traveling on school business and you did not file a TA for the trip, there is no school responsibility for your travel. This would be especially critical if you were in a foreign country. The form should be a fairly accurate estimate of the expenses you expect to incur. The form must be signed by you, the person supplying the funding, the Department Head, and Kay Godel-Gengenbach in OIP if the trip is out of the country. This has to be done before you leave. If you are traveling internationally, the TA has to be in OIP 2 weeks before you leave. The second part of each trip is filing the Travel Expense form (TE). This form details your actual expenses and closes the trip paperwork. Original receipts are required for all expenses for which you will ask for reimbursement. The form needs to be submitted within 20 working days of the trip. Anything after that could be treated as taxable income. Signatures are required by you, the person supplying the funding, and the Department Head. If there are no expenses to declare, i.e., the school is not paying for your trip, only a Travel Authorization is required PRIOR to the trip. The School may not reimburse your travel if you do not follow the procedures. Travel forms and policies are located at: http://inside.mines.edu/Accounts_Payable-Travel Debbie is always available to answer any questions you have about the forms and procedures.

2. Supplies - Whether these are materials for a lab or research supplies, check with Debbie before ordering, reserving, promising to buy from a person or company, or buying anything. The State requires purchases be made with purchase orders or school credit cards. Bring complete information about the vendor (name, address, phone) and a quote of the items needed to be ordered to Debbie in order to begin the purchase process. Also bring the account number to which the purchases are to be charged. Debbie has access to on-line ordering that provides school discounts with such suppliers as Fisher Scientific and VWR. She will place the order.

3. Posters - The Computing Center (CCIT) has poster printing capability. You will need to take a form to CCIT to pay for the printing. Debbie has these forms. She will need the account number to which printing is to be charged.

4. Chemicals - DO NOT ORDER chemicals to be brought onto campus. You must go through Environmental Health and Safety (EHS) when you need chemicals. They will determine if the chemical can be brought onto campus. They have some chemicals in stock. If what you need is not in stock, they will order it. You will need to provide them with an account number. Anyone planning to use chemicals must attend a training course and get certification from EHS.

5. Registration for meetings - If your advisor is paying for your meeting registration with a grant, Debbie can send a check or credit card number to pay for it. Take the completed forms and the account number to her for processing. If you pay for the registration yourself and expect to be reimbursed, you can not be reimbursed until after the meeting date.

6. Analyses - For off-campus analyses, a purchase order must be in place before you can order them to be performed. Bring the vendor information, analyses information, and the account number to Debbie so a purchase order can be issued.
7. Travel Expense Support for Technical Presentation at Professional Meetings –
   Depending on the availability of funds, the Department will help defray travel expenses
   for graduate students whose abstracts have been accepted for oral or poster session
   presentation at regional, national, or international meetings. The Department strongly
   encourages such professional activities. Written requests for such support, with
   supporting documentation, should be submitted to the Department Head as soon as the
   abstract has been accepted.

Graduate Student Offices

Graduate student office space is allotted each semester on a priority basis and is coordinated by
the GE Office. We attempt to ensure that as many graduate students as possible have office
space. Office space is always at a premium. Space will only be issued to students who plan to use
their office on a regular basis. Please do not ask for space if there is a chance you won’t use it.

The order of priority is:
   1. Teaching Assistants
   2. Student Research Assistants
   3. Ph.D. Candidates actively working on dissertation
   4. M.Sc./M.Eng. Candidates actively working on their thesis

Graduate students may retain their office only during the period in which they hold a TA, RA or
are actively engaged in writing their thesis. When no longer entitled to an office, students must
vacate the space making it ready for the next occupant and notify the GE Office personnel that
they have vacated. A wait list will be maintained of requests for office space that will be awarded
when space becomes available.

Keys/Blastercards

Blastercards are issued to all students by the school. This Blastercard is required for entry into
any campus building after regular school hours and on weekends. Some laboratories in Berthoud
Hall require Blastercard activation for access. The computer room 222 has Blastercard access.
Forms requesting access to Berthoud Hall and labs are in the main office. Students eligible for
office space will be issued a key to the assigned area.

Mailboxes

Each semester, every active graduate student in the Department is assigned a mailbox located in
Room 215 of Berthoud Hall. Graduate students are not to use the Department as their principal
mailing address. The CSM mailroom will not deliver incoming or accept outgoing personal mail.

Departmental Computer Facilities

The student Computer Labs are located in Rooms 201 and 222. A network account agreement is
required before you can obtain access. These forms are in the main office. Office personnel will
supply paper and printer cartridges for computer labs.

Room 222 is reserved exclusively for student use. Room 201 is a teaching and short course lab.
Pre-approved scheduling controls use of room 201. When not in use for classes or short courses,
it is available for student use. We have many sophisticated geologic applications and special
hardware items such as a digitizing tablet, a slide scanner, and a flat-bed scanner. In addition, all computers have CD-burners.

Room 203 is reserved exclusively for students (both undergraduate and graduate) working on research projects requiring the use of high-end workstations with advanced graphics cards. The workstations run a suite of programs dedicated to sub-surface analysis. Access to Room 203 is controlled through a Blastercard swipe key with approval by Dr. Bruce Trudgill, Dr. Steve Sonneberg, and Cathy Van Tassel.

A few simple rules must be followed to ensure these resources will remain available.

1. Clean up after yourself. Do not abuse the Department’s Computing Labs.
2. No food or drink allowed in lab.
3. You may bring children, but permission must be granted before they can use any computer.
4. Pets are not allowed in Berthoud Hall as per CSM rules.
5. Do not change any files or settings on the computers.
6. Do not add, move, or remove any hardware. Exercise extra care with network cables. They are fragile and you may cause the system to crash if tampered with or moved.
7. If you have problems with lab computers or your computer account, fill out a trouble ticket at http://helpdesk.mines.edu requesting assistance.
8. Do not add, move, or remove any hardware. Exercise extra care with network cables. They are fragile and you may cause the system to crash if tampered with or moved.
9. Computers and printers remain on at all times. DO NOT TURN THEM OFF.
10. The Department has a policy in place for software compliance. Do not copy or install any software to or from workstations or the network. If specific software is required that we do not have, discuss implementation with the Department Staff. We must have licenses, original media and supporting documentation for all installed software.

Printing costs for the Department are high. Students will be allotted 500 pages annually free of charge. Once that limit has been reached, payment will have to be made to have printing privileges at a price of 5 cents per page. Payment is made to Debbie.

This computer network is a result of the Department’s commitment to the use of computer technology in the geosciences and is supported by Department money as well as your technology fee. Please treat the system accordingly and understand that most hardware replacements, repairs, and software upgrades are paid for directly by the Department. Money conserved on repairs and replacements can be applied toward new purchases, so it is in your best interest to take care of these computers as if they were your own.

Campus Computing, Communications, and Information Technologies (CCIT)

Campus Computing, Communications, and Information Technologies provides computing and networking infrastructure and resources for CSM. Staff members serve as a resource to students as they conduct their studies.

Most computer systems are connected to the campus network and have access to the Internet and campus library resources. Black and white and color printing is available as well as poster printing and transparencies; check with the Help Desk (156A) in the Computer Commons for current charges.

All students need to establish a CSM e-mail and ADIT account. You may create personal web pages. Over 2,000 computer-based training courses are available. Virus protection and personal firewall software is available through the CCIT web page free of charge to registered students.
Use of Laboratories and Equipment

Classrooms are equipped with computers and LCD projectors. If needed, the Department has a laptop computer and LCD projectors that can be reserved through Debbie. If this equipment is unavailable from the Department, the Computing Center might be able to supply it.

Use of various laboratories is monitored by the faculty and/or staff member in charge of each facility. Access to, and use of, these facilities is granted by Department assistants upon written permission from the responsible faculty/staff member. Students must demonstrate their ability to operate specific laboratory equipment independently before receiving access to that laboratory. Questions regarding use of any lab should be directed to the designated person listed below. For a listing of analytical equipment see appendix. Mandatory hazardous waste training conducted by the Environmental Health and Safety Office needs to be taken by all students.

<table>
<thead>
<tr>
<th>Lab</th>
<th>Location</th>
<th>Responsible Person</th>
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<tbody>
<tr>
<td>Sample examination</td>
<td>Room 110</td>
<td>Thomas Monecke</td>
</tr>
<tr>
<td>Mineral Separation Lab</td>
<td>Room 404</td>
<td>Thomas Monecke</td>
</tr>
<tr>
<td>Fluid Inclusion</td>
<td>Room 111</td>
<td>Murray Hitzman</td>
</tr>
<tr>
<td>Geochemistry</td>
<td>Room 406</td>
<td>John Humphrey/Ric Wendlandt</td>
</tr>
<tr>
<td>High Pressure</td>
<td>Room 407</td>
<td>Ric Wendlandt</td>
</tr>
<tr>
<td>Mass Spectrometer/Isotope</td>
<td>Room 406</td>
<td>John Humphrey</td>
</tr>
<tr>
<td>Optical Mineralogy</td>
<td>Room 401</td>
<td>Ric Wendlandt</td>
</tr>
<tr>
<td>SEM</td>
<td>Room 405</td>
<td>John Skok</td>
</tr>
<tr>
<td>Sample Prep</td>
<td>Room 147</td>
<td>John Skok</td>
</tr>
<tr>
<td>Thin Section</td>
<td>Room 147</td>
<td>John Skok</td>
</tr>
<tr>
<td>X-Ray Diffraction</td>
<td>Room 405</td>
<td>Ric Wendlandt</td>
</tr>
<tr>
<td>QEMSCAN</td>
<td>Room 118</td>
<td>Nigel Kelly/Katharina Pfaff</td>
</tr>
<tr>
<td>Source Rock Analyzer</td>
<td>Room 225</td>
<td>Steve Sonnenberg</td>
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Brunton compasses, Jacob’s staffs, and measuring tapes can be checked out from John Skok. Other types of surveying equipment can also be checked out from the Engineering Department. The Department has a limited number of hard hats that can be checked out along with safety vests and traffic cones. See Summer for this equipment.

Lab and Work Request Procedures

Thin Section Lab
John Skok operates the thin section lab in Room 147 of Berthoud Hall. John will cut, polish, and stain thin sections. Check with him if special processing of thin sections is needed. All submissions of samples for thin section processing require a thin section request form (see Appendix). For a thesis that requires petrographic work, a signed form from the advisor will be required for processing thin sections.

The following analytical preparation procedures can be accomplished in the Thin Section Lab:

- Sample cutting
- Sample polishing
- Production of petrographic thin sections
- Production of polished thin sections
- Staining of thin sections
- Impregnation of thin sections
• Crushing and grinding of samples
• Sieving of samples
• Magnetic mineral separation

The standard method for graduate students to request any of the above procedures involve the following steps:
1. Meet with thesis advisor to discuss an overall plan with respect to analytical procedures to be used for samples.
2. Obtain a “Thin Section Request Form” from the Main Office, complete it by identifying the specific procedures to be followed, listing all samples by number, and have thesis advisor sign form.
3. Take samples and form to John Skok and discuss with him specific procedures, timing, and costs.

Graduate students are allowed to use the equipment in the Thin Section Lab after proper training. Students should set up a training session time with John Skok. After the student is trained on a piece of equipment, they can schedule times to use it on their own.

SEM Lab
The following analytical procedures can be accomplished in the Scanning Electron Microscope Lab (Room 405B)
• Secondary electron imaging
• Backscatter electron imaging
• Energy dispersive X-ray analysis (Qualitative)
  Printing of X-ray spectra
• Image photography
• X-ray dot mapping

The standard procedure for graduate students to request use of the SEM involves the four following steps:
1. Meet with thesis advisor to decide on specific goals to accomplish on the SEM and which samples to analyze.
2. Meet with John Skok to discuss planned use of the SEM and to deliver samples for preparation. Meet with him for initial training session on sample coating and use of SEM. Graduate students are allowed to use the SEM independently once they have received permission from John Skok.
3. Reserve time using the sign-up sheet posted on door of Room 405B.

Policies and Procedures for using Geochemistry Labs in Berthoud 406

Student and faculty users of the Geochemistry Labs (Berthoud Hall 406) are required to adhere to policies and procedures that create a collegial work environment and that ensure the safety of all users. The following policies have been developed to be in compliance with school-wide chemical hygiene policies administered by Environmental Health and Safety (EHS).

Each lab in Berthoud 406 has a Lab Supervisor and permission to use facilities in these areas should go through these individuals:
406B - Humphrey;
406A, D, E, and core lab - Wendlandt; and
406C - Kelly.
The Department Head assumes overall responsibility for adherence to safety policies and procedures in all labs.

Because our general purpose geochemistry lab (406) is small and serves diverse teaching as well as research needs, we have to enforce the access and equipment policies listed below:

- Priority for student use of general lab space in 406 is as follows:
  a. Teaching
  b. Students/post-docs on funded grants advised by GE Faculty
  c. Students/post-docs without funding advised by GE Faculty
  d. Other users

- Completion of EHS Safety and Hazardous Materials training is required prior to working in the lab.

- Faculty are expected to provide all the equipment, chemicals, and other supplies needed by their project. A research-quality balance, small amounts of general purpose glassware and several drying ovens are available for communal use, however specialized equipment and necessary supplies, including refrigerator space exceeding about ½ shelf, must be obtained by individual investigators.

- De-ionized water is not provided in BH 406. Each investigator is responsible for providing their supply of water, including the container.

- Each individual must maintain a safe environment that does not present a hazard to other lab users, particularly when a work area is left unattended, when experiments are in progress, and after completion of experiments.

- The labs are inspected at unannounced intervals by EHS, the Golden Fire Department, the Lab Supervisor (Wendlandt), and Department Manager (Humphrey) for compliance with departmental and EHS guidelines.

  - **All users will execute an agreement** (see Appendix), signed by the user, faculty advisor (or faculty sponsor in the case of post-docs and visitors), and the lab supervisor, which will include the particular details of their lab use. This agreement allows the Department to have accurate records of the types and locations of chemicals, their hazards, and appropriate disposal, ensures that EHS and each Lab Supervisor conducts proper user training, ensures that users are fully aware of the health and safety issues pertaining to their research, and emphasizes the shared responsibilities of students, advisors, and lab supervisors. In the case of students, this agreement will include a check-out procedure that must be completed when the work is completed and prior to graduation. A copy of this agreement will be placed on file with the Department Manager and a second copy will be placed in the lab being used.

- Oversight of all aspects of student (undergraduate and graduate) use of the lab by faculty advisors is required.

- Depending on the duration of the requested lab work, Blastercard access to BH406 may or may not be granted.
Faculty hosting visitors on sabbatical leave are responsible for checking lab space availability before the visitor arrives and confirming that lab supervisors are willing to conduct necessary training and oversight of the visitor.

LABORATORY SAFETY TRAINING PROVIDED BY EHS

- **Graduate Student Safety Seminar** (Mandatory). All incoming graduate students who work in laboratories and shops are required to attend. EHS provides the training on two occasions at the beginning of each semester. The presentation takes about 100 minutes.

- **Hazardous Materials Training** (Mandatory). All campus personnel who procure regulated materials or who generate regulated chemical waste must attend this training on an annual basis. This includes faculty members, staff members, graduate students and some undergraduate students. This training is required by federal and state law and is offered by the EHS Department at the beginning of each semester. The EHS Department maintains a list of persons who have received the training within the last year and are thereby "authorized" to handle regulated materials. Unauthorized persons who request chemical procurement or waste disposal service are notified that service has been denied because their training is no longer current.

- **Hazard Communication in Laboratories.** OSHA prescribes the implementation of a "Chemical Hygiene Program" for laboratories. A primary component of this program is "Hazard Communication." This means that all personnel should be informed of the properties of hazardous materials in the lab and should be informed of hazards and safety procedures associated with lab equipment and processes. One of the ways this is done at CSM is by posting MSDS information sheets on a clipboard which is mounted in the hallway outside each lab. Most CSM labs have such clipboards. The CSM Safety Officer checks the accuracy of laboratory MSDS files during annual building inspections. In addition, each time the EHS Department issues a chemical from our Central Storage and Distribution Facility, the recipient is reminded to review the MSDS for the chemical. If the recipient does not have an MSDS, one is provided.

- **Radiation Safety Training** (Mandatory). Faculty members and graduate students who wish to be qualified to independently handle licensed radioactive material must attend a 10-hour Radiation Safety Course. The course is offered by the Radiation Safety Officer each semester. Faculty supervisors of radiation-producing equipment (x-ray machines) are responsible to provide training for users of such equipment.

GRADUATE STUDENT ORGANIZATIONS

The American Association of Petroleum Geologists (AAPG), Association of Environmental Engineering Geologists (AEG), Society of Economic Geologists (SEG), and American Institute of Professional Geologists (AIPG) all have student chapters on campus. There is also the Association of Geoscience Students (AGS). New students are encouraged to become involved in the activities of these groups. It is a great way to make contacts, learn useful information about the Department and help shape your life and studies at CSM.

AEG is open to students in disciplines related to engineering geology, geological engineering, and hydrogeology. The purpose of the organization is to promote activities that expand the experience and knowledge of the student members in these disciplines.
Monthly meetings, which feature speakers from industry and government, are held along with field trips and social events.

- Any student studying the geological sciences is eligible for membership in SEG. Purposes of the Society are to encourage increased knowledge of geology and its application to mining and mineral deposits, to promote professionalism and provide opportunities to meet geological professionals in the mining industry. Activities include technical speakers, field trips, and social events.
- The student chapter of AAPG is open to any student majoring in geology. The purpose of the chapter is to advance the science of geology, especially as it relates to petroleum and natural gas and to promote and maintain a high standard of professional conduct. Activities include speakers, field trips, and social events.
- AGS is open to graduate and undergraduate students interested in the enjoyment of geology and promotion of geologic education. Activities include field trips to mineral localities, historic mining districts, oil fields, museums, mineral shows, professional conventions, and presentations by invited speakers.
- AIPG is open to all geology students. It is an umbrella organization encompassing all geology disciplines. It focuses on promotion of high standards of professional practice and communication of the importance of geology to society. Meetings are held during the academic year and presentations focus on topical issues such as ethics, junk science, and responsibilities of a consultant.
GENERAL REQUIREMENTS FOR GEOLOGY AND GEOLOGICAL ENGINEERING
GRADUATE DEGREE PROGRAMS

Introduction

Graduate students must meet a number of responsibilities and fulfill certain requirements during their degree program. This section presents these requirements, deadlines, and suggested guidelines for completing these responsibilities. A two-year Master’s program is possible, but only if these deadlines and guidelines are followed closely. The duration of Ph.D. programs is more variable. Examples of the forms referred to below are included in the Appendix.

Graduate Advisory Committee (GAC)

The GAC consists of faculty members of the Department. The GAC selects new graduate students, issues approval for leaves of absence and thesis committees. Policy changes affecting graduate programs are first considered by the GAC before submission to the Department faculty. The GAC makes minor policy decisions and establishes procedures for administering the graduate program.

Registration

1. Continuing students should preregister to insure that a class will have sufficient enrollment to be held. Without sufficient enrollment classes may be dropped – it is in your best interest to pre-register! The Department expects students to register before classes begin each semester. This permits the Department to make final decisions on classes and teaching assignments and permits you to begin classes in an orderly manner. Timely registration permits the school to acquire state funds that are reflected in financial aid to students and the Department. Students who have not registered before the School’s registration deadline, which is ten working days after the beginning of each semester, will be assessed a $100 late fee.

2. Payment of tuition and fees.

Full-Time Student Hour Requirements

To be deemed full-time during the fall and spring semesters, students must register for 9 or more hours of course and/or research credit. However, international students need only register for 6 credit hours per semester during their first year if they are required to take special language instruction or are accepted in Provisional Status. In the event a thesis-based student has completed his or her required course work and research credits (36 hours for master’s students and 72 hours for doctoral students) and is eligible for reduced, full-time registration, the student will be deemed full-time if he/she is registered for at least 4 hours of research credit.
Eligibility for Reduced Registration

In order to be considered for the reduced, full-time registration category, students must satisfy the following requirements:

- For M.Sc./M.Eng. students, completion of 36 hours of course and research credit hours combined;
- For Ph.D. students, completion of 72 hours of course and research credit hours combined;
- For all students, an approved Admission to Candidacy form must be on file in the Graduate Office within the first week of the semester in which you are applying for reduced registration;
- Admission to Candidacy forms will be due no later than the semester prior to applying for graduation;
- Candidates for thesis-based degrees may not use more than 12 credit hours per semester in determining eligibility for reduced, full-time registration.

Leave of Absence

Leave of absence will be granted only when unanticipated circumstances make it temporarily impossible for students to continue to work toward a degree. Any request for a leave of absence must have the prior approval of the student’s faculty advisor, Graduate Advisory Committee, the Department Head, and the Dean of Graduate Studies. The request for a leave of absence must be applied for in writing (see Appendix) and must include (1) the reasons why the student must interrupt his or her studies and (2) a plan (including a timeline and deadline) for resuming and completing the work toward the degree in a timely fashion. Thesis-based students may not do any work related to their thesis and may not discuss their thesis with their faculty advisor while on a leave of absence. Students who wish to return to graduate studies after an unauthorized leave of absence must apply for readmission and pay a $200 readmission fee.

Grade Point Average

A cumulative GPA of 3.0 out of 4.0 must be maintained. Failure to maintain a 3.0 GPA will result in academic probation. Students failing to attain a 3.0 GPA by the end of a semester during which they are on probation are subject to suspension. Credit will be given for a grade of “C”, however, a GPA of 3.0 or higher must be maintained. Graduate credit will not be given for courses in which grades less than “C” were received.

Transfer Credits

Transfer credits from other universities or from non-degree programs at CSM must be approved by the student’s committee, GAC, and the Graduate Dean. Only courses in which a grade of “B” or better was received may be considered for transfer. These credits will not be used in calculation of a student’s GPA. A maximum of 9 hours, which were not counted toward any other awarded degree, can be transferred into a Master degree program. Twenty-four hours of course credit may be granted to Ph.D. students entering with a M.Sc. degree. No more than 9 hours taken as a CSM non-degree student can be transferred and no more than 3 of these units can be 400-level. The remainder must be graduate level.

Progress Grades

A student may receive a grade of In Progress-Satisfactory or In Progress- Unsatisfactory (PRG or PRU) for a course or research hours. An In Progress grade indicates that the work is not
Complete. Progress towards successful completion of a graduate degree shall be deemed unsatisfactory if any of the following conditions occur: failure to maintain a cumulative grade point average of 3.0 or greater or receipt of an In Progress-Unsatisfactory for research hours. Upon the second occurrence of an unsatisfactory progress indication, the Dean shall notify the student that he or she is subject to discretionary dismissal according to the “Unsatisfactory Academic Performance” section listed in the Bulletin.

Incomplete Grades

If a graduate student fails to complete a course because of illness or other reasonable excuse, the student receives a grade of Incomplete. The grade INC indicates deficiency in quantity of work and is temporary. A graduate student must remove all Incomplete grades within the first four weeks of the first semester of attendance following that in which the grade was received. If not removed within the four weeks, the Incomplete will become an F.

Graduate Seminar

All Geology Master Degree students are required to take GEOL 507 Graduate Seminar. GEOL 507 is designed as a catalyst for initiating and conducting research. It focuses on research design and effective communication of research results. Students should take GEOL 507 either during preparation of their thesis proposal, or in the early stages of their research.

Deficiencies

Students with an insufficient background in a particular area of geology or related science will be notified at the time of acceptance. They will be required to take appropriate courses to satisfy these deficiencies as approved by their committee and maintain a B average in any deficiency course. No graduate credit will be received for these courses. Any student receiving a “D” in a deficiency course will be required to repeat the course. Deficiencies should be removed as soon as possible after enrollment. Deficiency courses may be taken at a school other than CSM if approved by the Graduate Advisory Committee.

Temporary Advisors

Upon acceptance, students are assigned a temporary advisor by GAC. The role of the student’s temporary advisor is for guidance and advice. A research or thesis advisor should be chosen by each student through consultation with faculty in the student’s area of interest, and a thesis-based committee should be formed by the end of their second semester. Students should not feel obligated to select a thesis topic under their temporary advisor. For any change in temporary advisor or committee, an Advisor/Thesis committee form must be completed and processed (form online, see appendix for sample).

Research/Thesis Committees

Students pursuing degrees should choose a research or thesis advisor and thesis committee by the end of their second semester by meeting with faculty members who are interested in appropriate research topics. All thesis-based students are required to have a thesis advisor and committee while non-thesis based students require a research advisor only. A research advisor/thesis advisor and committee form is available online (see appendix for sample). The advisor and committee members must initial and sign the form. It should be submitted to Summer Jackson who will present it for approval by GAC and the Department Head before submission to the Graduate
School. An approved copy of the form will be returned to student. The purpose of a research advisor or thesis committee is to monitor progress of courses and research/thesis work. Meetings between student and research advisor or thesis committee should be arranged as needed and should be no less than one per semester. It is most important that the student and research advisor or thesis committee stay closely in touch to prevent any miscommunication or misinterpretation of work to be done and progress to be made. It is up to the student to schedule all meetings. The research advisor or thesis committee will oversee the student’s entire graduate program including transfer of credits, elimination of deficiencies, course of study, and in the case of a thesis-based program, thesis proposal, thesis research, and thesis defense.

Thesis advisors must be members of the Department. Tenured or tenure track faculty may advise graduate students. Research faculty members may co-advise graduate students with a Department tenured or tenure track faculty member or may serve as a thesis advisor if they meet minimum requirements listed below and have been approved by the GAC and the Department Head. Research faculty members wishing to serve as graduate advisors, as a minimum must have 1) served as co-advisor (through completion of degree) to at least one thesis-based CSM graduate student, 2) a record of on-going relevant research, and 3) a full-time presence in the Department. The Research faculty member may apply to the GAC for advisor status, and the GAC will make a recommendation to the Department Head. All graduate committees are subject to approval by the GAC, Department Head, and Dean of the Graduate School.

A minimum of three faculty members constitute a M.Sc. committee; two members should be from the home department, however, exceptions can be made with the approval of the GAC. At least one member of the committee must be a tenured or tenure-track CSM faculty and will serve as the “committee chair.” The roles and involvement of adjunct and emeritus faculty are variable and, therefore, their membership on these committees must be approved by GAC on a case-by-case basis. Additional members, such as non-CSM personnel, may be included on the committee. Off-campus members have the option of voting or non-voting (ex officio) status. Voting members have all responsibilities of academic members, including advising on technical matters, reading and critiquing the thesis, attending committee meetings, the qualifying examination, and the defense of dissertation. A brief resume for off-campus committee members who hold voting status on the committee is required and must be attached to the initial thesis committee form. Faculty and others outside the Department may serve as co-advisors. In the use of a co-advisor, the required committee members are increased by one member.

For a Ph.D. dissertation committee, there must be a minimum of four members; at least two members from the home or allied departments, and one (tenured/tenure-track) member outside the home or allied department recommended by the student and advisor(s). Individual committees can be established with more than four members. A majority of the voting members of the committee must be tenured or tenure-track CSM faculty members. The roles and involvement of adjunct, emeritus, and research faculty are variable and, therefore, their membership on these committees must be approved by GAC on a case-by-case basis. Additional members, such as non-CSM personnel, may be included on the committee. Off-campus members have the option of voting or non-voting (ex officio) status. Voting members have all responsibilities of academic members, including advising on technical matters, reading and critiquing the dissertation, attending committee meetings, the qualifying examination, and the defense of dissertation. A brief resume for off-campus committee members who hold voting status on the committee is required and must be attached to the initial thesis committee form. Faculty and others outside the Department may serve as co-advisors. In the use of a co-advisor, the required committee members are increased by one member.
Qualifying Examinations

Ph.D. students must pass qualifying examinations by the end of the second year of their programs. This timing may be adjusted for part-time students. The examination will be administered by the student’s doctoral committee and will consist of an oral and a written examination administered in a format to be determined by the student’s doctoral committee. Two negative votes by the doctoral committee constitute failure of the examination.

In case of failure of the qualifying examination, a re-examination may be given upon the recommendation of the doctoral committee and approval of the Graduate Dean. Only one re-examination may be given.

Degree Audit and Admission to Candidacy

Prior to submitting a Degree Audit and Admission to Candidacy form there must be a thesis committee on record with the Grad Office and Department. All degree (thesis or non-thesis) candidates must submit a Degree Audit and Admission to Candidacy by completing all prerequisites and core curriculum course requirements. For thesis-based students, the form must be submitted within the first calendar year after enrolling in the Master degree program and within the first two calendar years in the Ph.D. program. Admission to Candidacy must be granted before the student is permitted to defend his/her M.Sc. or Ph.D. thesis.

This application (online, see sample in appendix) must be reviewed and approved by the committee or non-thesis research advisor and should contain a complete list of courses (completed, in progress, and proposed) being used toward the degree. This includes transfer courses and 400 level courses (if applicable) along with 500/600 level courses used to satisfy requirements for the degree. Upon approval by the Department Head, the form is submitted to the Graduate Dean for agreement. Any changes in the course program listed on the Admission to Candidacy form must be reapproved by the thesis committee, or research advisor, and Graduate Dean.

Non-Thesis Procedures

Non-thesis degree students must have their research advisor submit a memo to Summer Jackson indicating the student will be graduating. A Statement of Work Completion will be prepared for advisor’s signature. The memo must be submitted by November 8, 2013, and April 4, 2014.

Thesis and Dissertation Procedures

Each candidate for the thesis-based M.Sc. or Ph.D. (Geology or Geological Engineering) degree will be required to write a thesis acceptable to the committee and Department. The thesis must show original research of excellent quality in a suitable technical field and must exhibit satisfactory literary merit. The subject of the thesis is selected by mutual agreement between the candidate and the advisor and/or co-advisor, if applicable. Any major change in the scope of the research requires the approval of the thesis committee. It is the responsibility of the advisor or co-advisor to supervise the research and to consult with other members of the thesis committee on the progress of the work. During the final semester of the program, each candidate must pass an oral defense of thesis which may cover course work as well as the thesis. Format instructions are available in the Graduate Office and should be obtained before beginning to write the thesis.
Proposal

A thesis or dissertation proposal is required of all candidates for the purpose of (1) defining the scope of the proposed research and (2) to permit the thesis committee to determine the suitability of the research for a graduate thesis. The proposal should be approved by the thesis committee prior to the start of significant work on the project.

The proposal should stress the original research involved and follow the general outline listed below:

1. Title
2. Objectives and purpose
3. Thesis area location
4. Scope of research
5. Previous research of record
6. Description of proposed research
7. Schedule for completion of proposed research
8. Budget and funding source
9. Course schedule (including deficiencies, qualifying exam courses, and completed courses)
10. Written release for public disclosure of results (when outside funding is involved).

An outline for the thesis proposal should first be submitted to the thesis advisor for approval prior to writing and formal submission of the proposal itself. The proposal should be written in a concise format. The thesis committee will review the proposal and may suggest changes. After committee approval, a copy must be placed in the student’s file.

Budget

Thesis/dissertation research (travel, living expenses, analysis, thin sections, etc.) costs can be significant. It is the responsibility of the student to develop a budget and plan for financial support prior to committee approval of the proposal. Individual faculty members or the Department may, in some cases, be able to provide assistance in securing support.

Proprietary Research

Under special circumstances, the School may enter into an agreement with a sponsor to include proprietary research in a graduate student’s thesis or dissertation. The nature and extent of proprietary research reported in the thesis or dissertation must be agreed upon in writing by the sponsor, principal investigator, student, and Dean of Graduate Studies. The thesis defense will remain open to the public. Denial of public access to the written thesis will be limited to a maximum of twelve months from the date of submittal of the Statement of Work Completion form to the Dean of Graduate Studies.
Manuscript Preparation

An “ideal” sequence for draft preparation and review is as follows. The student, in conjunction with the advisor, prepares an initial outline of the thesis. This outline is developed into a draft (including all figures, tables, and plates), which is submitted to the thesis advisor and/or co-advisor, if applicable, for the first review. Follow Thesis Checklist procedures at inside.mines/checklist. After the first draft has been returned to the student, a second draft is prepared which incorporates the revisions, corrections, and suggestions made on the draft. Upon approval of a defensible draft, the student may schedule a defense. See Thesis and Dissertation Defense Deadlines. Further revisions may be required as a result of the defense, so final copies should not be prepared until the advisor approves the completed thesis.

Thesis and Dissertation Defense

The defense must be open to the public and should occur at least one week after public notification of the scheduled defense date. Following the satisfactory defense of the thesis, the student will complete any revisions specified by the thesis committee and, after approval by the advisor, submit it to the Department Head for signature before submitting the final copy to the Graduate Office for format approval. See Grad School Guidelines.

Two negative votes from the thesis committee constitute failure of the oral defense regardless of the number of committee members present at the defense. At the discretion of the thesis committee, a second oral defense of dissertation may be scheduled. A second failure to defend the dissertation satisfactorily constitutes automatic, irrevocable termination of the graduate program. In either case of pass or fail, members voting in the negative may file a report on why they voted to fail. In the case of failure, the Chair of the Thesis Committee will prepare a written statement indicating the reasons for failure of the defense and will provide copies to the student, Thesis Committee, the Department Head, and the Graduate Dean.

Graduation Deadlines

Students must complete the following steps by the stated deadlines in order to defend their thesis and graduate at the end of a semester. The defense is scheduled via the Thesis Defense Request form (online, see sample in appendix) and signed by all committee members showing their approval to meet at the agreed upon time and date. Submit the completed form to Summer Jackson, at least one week in advance of the thesis defense date. She will assign a room for the defense and will send announcements of the defense to committee members, the student and post the notice on the lecture board. The Statement of Work Completion will be sent to the thesis advisor.

- **September 4, 2013 and January 23, 2014** - Graduation Application must be submitted to the Graduate Office.
- **October 29, 2013 and March 24, 2014** - Last day to defend thesis.
- **November 14, 2013 and April 7, 2014** - Last day for thesis upload. The Department Head’s signature is required on title page.
- **November 15, 2013 and April 11, 2014** - Checkout card and Work Completion form must be submitted to the Graduate Office.
Conversion from Master to Doctoral Program (Geology)

A student who has started a Master of Science program may request permission to convert to a Doctoral program without obtaining the Master degree, provided all requirements for the Master degree, except the completion of the thesis, have been completed. International students are advised to complete a Master degree prior to applying for the Ph.D. program. The procedure to be followed is outlined below:

- After completing the equivalent of at least one summer working on the Master of Science research project, the student should confer with the thesis committee and obtain permission to initiate an application for conversion to the Ph.D. program. Approval by the committee at this time is only approval to initiate the application and does not constitute Departmental approval of the conversion.
- If the committee approves initiation, the student should then prepare a report, substantiated with appropriate illustrations, explaining the results of research accomplishment to that date.
- A separate written proposal defining the purpose and scope of the proposed doctoral program should be prepared and submitted together with the above report. This proposal should include a justification for the conversion of the initial Master program to a Doctoral program and specify the scope and nature of the proposed research for the doctoral dissertation (i.e., what has changed in the original research program to qualify for a dissertation?).
- The committee will then arrange a meeting time for presentation and defense of the proposal. The examining committee will consist of the student’s M.Sc. committee. Upon written committee approval of the proposal, the student will then be allowed to submit an application through the on-line application system. Letters of recommendation, transcripts, GREs and statements of goals will not be required of the applicant. The application will be processed according to procedure.

Completion of M.Sc. Program and Admission to Ph.D. Program

A student who completes a Master degree program is not automatically allowed to continue in a Doctoral program. A student wishing to continue for a Ph.D. will complete an on-line application through the school application system. If a student is admitted before all Master degree work is completed, all Master degree requirements must be satisfied by the end of the first semester after enrollment in the Ph.D. program.