

Department of Geology and Geological Engineering  
SD Mines

# Graduate Student Handbook: 2018-2019

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**Geology and Geological Engineering Faculty and Staff****Department Administration**

Dr. Laurie Anderson	<i>Department Head and Museum Director</i>	MI 303 PRL 112
Cleo Heenan	<i>Senior Secretary</i>	MI 305

**Geology Faculty**

(Professors)

Dr. Laurie Anderson	<i>Paleobiology, Paleoecology, Taphonomy</i>	MI 303 PRL 112
Dr. Edward Duke	<i>Manager of Analytical Services, Petrology, Geochemistry, Remote Sensing</i>	MI 234
Dr. Timothy Masterlark	<i>Graduate Program Director, Geophysics and Numerical Modeling</i>	MI 308
Dr. Maribeth Price	<i>Dean of Graduate Education</i>	C 2201
Dr. Nuri Uzunlar	<i>Director BHNSFS</i>	MI 306

(Associate Professor)

Dr. Darrin Pagnac	<i>Mammalian Paleontology, Paleoecology</i>	PRL 213
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(Assistant Professors)

Dr. Zeynep Baran	<i>Basin Analysis, Structural Geology and Tectonics, Extensional deformation</i>	MI 312
Dr. Sarah Keenan	<i>Vertebrate Taphonomy, Low-temperature Geochemistry, Geomicrobiology</i>	PRL 111
Dr. Gokce Ustunisik	<i>Igneous and Experimental Petrology, Planetary Petrology</i>	MI 302
Dr. Kevin Ward	<i>Seismic Imaging, Geophysical Inverse Problems, Broadband and Nodal Geophone Deployments</i>	MI 304

**Geological Engineering Faculty**

(Professor)

Dr. Larry Stetler	<i>Geological Engineering, Sedimentology, Surface and Groundwater, Environmental Geology, Petroleum</i>	MI 310
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(Associate Professors)

Dr. Kurt Katzenstein	<i>Geomechanics, Geological Engineering, InSAR</i>	MI 316
Dr. Foster Sawyer	<i>Sedimentology, Groundwater, Petroleum Geology</i>	MI 318

(Assistant Professor)

Dr. Liangping Li	<i>Groundwater, Geostatistics, Data Assimilation, Reservoir Modeling</i>	MI 314
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**Support Faculty and Staff**

Dr. Christopher Pellowski	<i>Coordinator and Instructor, GGE/BHNSFS</i>	MI 300
Mr. Curtis Price	<i>Lecturer, Geospatial Technology</i>	MI 301
Dr. William Roggenthen	<i>Research Scientist IV, Geological Engineering</i>	MI 327A
Ms. Sally Shelton	<i>Collections Manager, Museum of Geology</i>	PRL 114
Mr. Daniel Soeder	<i>ERI Director</i>	MI 315
Dr. Sui (Jay) Tung	<i>Research Scientist II, Geophysics</i>	MI 327A

**Emeritus Faculty**

Dr. Arden Davis	<i>Geological Engineering: Groundwater, Environmental Contamination, Digital Modeling</i>
Dr. James E. Fox	<i>Geology: Curator of Invertebrate Paleontology, Sedimentology, Petroleum Geology, Invertebrate Paleontology</i>
Dr. James E. Martin	<i>Geology: Emeritus Curator Museum of Geology, Vertebrate Paleontology, Biostratigraphy</i>
Dr. Colin J. Paterson	<i>Geology: Economic Geology, Mineral Resources, Petrology</i>
Dr. Perry H. Rahn	<i>Geological Engineering: Hydrogeology, Environmental Geology</i>

**Adjunct Faculty**

M. Anderson, Benton, Illes, McCormick, Nielsen, Valder, Zhou

**1 General Information****1.1 Acronyms**

ACA	Affordable Care Act
FERPA	Family Educational Rights and Privacy Act
GDR	Graduate Division Representative
GGE	Department of Geology and Geological Engineering
GPA	Grade Point Average
GRA	Graduate Research Assistant
GTA	Graduate Teaching Assistant
GPD	Graduate Program Director
MI	Mineral Industries Building
PDF	Portable Document Format
POS	Plan of Study
PRL	Paleontology Research Laboratory
SDBOR	South Dakota Board of Regents

**1.2 Purpose**

The Office of Graduate Education provides a broad framework of policies that are given in the Catalog. The purpose of this document is to provide additional Geology and Geological Engineering (GGE) descriptions of overarching graduate program expectations and outcomes. Individual Major Professor expectations (beyond those given by Graduate Education and GGE Program-wide descriptions) for graduate students vary considerably among the GGE faculty. Each graduate student must consult with his or her Major Professor to establish specific expectations. Such expectations include, but are not limited to, frequency of meetings; timing, content, and submission of draft thesis or dissertation components; preparation, submission, and publishing expectations; reading assignments and library usage; and plans for student support.

While the Major Professor will claim an advisory role for a graduate student at the time of admission, students are not bound to a specific Major Professor. A change in Major Professor requires a mutual agreement among the student, the potential Major Professor, and either the existing Major Professor or Dean of Graduate Education. Students who wish to explore a change in Major Professor should consult the Graduate Program Director (GPD) to discuss options, implications, and potential resolution strategies.

### **1.3 Keys**

Outside door keys, laboratory keys, and office keys for the MI building are available, with approval from the Department Head, Laurie Anderson. The Department secretary prepares the request form. For access to the PRL and offices and labs within the PRL, submit a request to Sally Shelton. Keys are dispensed by Facilities Services and must be returned prior to graduation.

### **1.4 Offices**

Teaching and research assistants are assigned offices according to the following priority basis:

1. GRA, GTA, and students having a Fellowship.
2. Students working with proprietary data or who require a physical South Dakota School of Mines network connection.
3. Unsupported PhD students.
4. Unsupported MS students.

### **1.5 Mail**

Graduate students will be assigned a mail slot in room MI 311.

### **1.6 Photocopying**

Student use of the department copier code is limited to GTA responsibilities. The code is available from the department secretary. The copier has scanning capabilities, which can deliver scanned documents to your email as a PDF. A special code is available for students wishing to scan and obtain electronic documents that are outside of GRA responsibilities. Scan-to-email instructions are posted above the copy machine. Students will abide by applicable copyright laws when scanning and photocopying.

### **1.7 Student and Professional Organizations**

Graduate students are expected to participate in student organizations and professional societies. GGE hosts several organizations and clubs spanning an informal book club, an honor society, and several discipline-specific professional organization chapters. Students are expected to explore and participate in professional societies, as appropriate. The Major Professor is expected to provide guidance on the merits of these opportunities.

#### **1.7.1 GGE Graduate Representatives**

GGE graduate students will elect one MS and one PhD student to serve as graduate student representatives. The election process will be organized annually by the incumbent representatives or by the GPD if necessary. Both graduate representatives will be invited to attend GGE Graduate Program meetings to ensure that graduate student perspectives are represented, as appropriate. Graduate representatives will organize an annual GGE Graduate Student Town Hall Meeting.

### **1.7.2 GGE Graduate Brownbag Seminar**

Graduate students are encouraged to participate in the GGE Graduate Brownbag seminar. This seminar is a weekly event that will be organized by the GGE graduate representatives and the GPD.

### **1.7.3 GGE Graduate Student Town Hall Meeting**

Graduate representatives will organize and set the agenda for an annual GGE Graduate Student Town Hall Meeting. All graduate students are expected to attend. The GPD will also attend to provide faculty perspectives.

### **1.7.4 GGE Seminars**

GGE hosts weekly seminars that are scheduled for Fridays, 4-5PM. Graduate students are expected to attend. The schedule is posted on the GGE webpage.

## **2 Graduate Program Policies**

It is each student's responsibility to understand the policies of both the Office of Graduate Education and GGE, which are periodically updated in the Catalog. Details of these policies are available from the Graduate Education section of the South Dakota School of Mines online Catalog and additional GGE guidance is given in this document. Questions about graduate policies may be directed to the Major Professor, the department head, the Graduate Education office staff, or the GPD.

### **2.1 Catalog, Policies, and Resources**

All South Dakota School of Mines, Graduate Education, and Departmental policies and information, including this document, are available online:

- South Dakota School of Mines:  
[www.sdsmt.edu](http://www.sdsmt.edu)
- Graduate Education:  
[www.sdsmt.edu/GraduateEducation/](http://www.sdsmt.edu/GraduateEducation/)
- GGE:  
[www.sdsmt.edu/Academics/Departments/Geology-and-Geological-Engineering/Geology-and-Geological-Engineering/](http://www.sdsmt.edu/Academics/Departments/Geology-and-Geological-Engineering/Geology-and-Geological-Engineering/)
- GGE (graduate forms and checklists):  
[www.sdsmt.edu/Academics/Departments/Geology-and-Geological-Engineering/Graduate-Education/Graduate-Checklists/](http://www.sdsmt.edu/Academics/Departments/Geology-and-Geological-Engineering/Graduate-Education/Graduate-Checklists/)  
The graduate forms and checklist page includes forms for Request for Travel, Initial Advising, and Laboratory Safety.

State-wide policies established by the South Dakota Board of Regents (SDBOR) are also available online ([www.sdbor.edu](http://www.sdbor.edu)). Students may efficiently navigate to the desired information via keyword search options near the top-right corner of these websites.

### **2.2 Advisor, Committee, and Plan of Study**

As part of the admission process into the GGE graduate programs, a Major Professor will claim responsibility for a graduate student and meet with the student for an initial advising meeting at the beginning of the first semester of a student's graduate program to assist in course selection

and defining the focus and nature of the student's program. During the first semester of a graduate student's program, the student and Major Professor will identify a full advisory committee. The student and this committee will define a Program of Study (POS), which must be endorsed by the committee and the Department Head and submitted to the Office of Graduate Education by the second semester of the student's graduate program. Emeritus and Adjunct Professors may not serve the role of Major Professor.

### **2.3 Deficiencies**

Graduate students having three or more deficiencies identified in the POS are ineligible for GGE support, including GTA appointments, scholarships, fellowships, and travel support. Students having fewer than three deficiencies, including those who initially had three or more deficiencies but satisfied a portion of requirements to have fewer than three active deficiencies are exempt from this policy. RA support is not subject to deficiencies.

### **2.4 MS Committee Composition**

The MS committee includes at least three SD MINES faculty: (1) the Major Professor, (2) the Graduate Division Representative (GDR), and (3) an additional faculty member having relevant expertise in the student's research topic. The student and Major Professor may choose to include additional committee members, which may or may not be SD MINES faculty, as appropriate. In all cases, the majority of the committee must be SD MINES faculty as defined in General Degree Requirements of the Catalog.

### **2.5 Accelerated MS Program**

Policies concerning the Accelerated MS Program for GGE available online via GGE Graduate Forms and Checklists ([www.sdsmt.edu/Academics/Departments/Geology-and-Geological-Engineering/Graduate-Education/Graduate-Checklists/](http://www.sdsmt.edu/Academics/Departments/Geology-and-Geological-Engineering/Graduate-Education/Graduate-Checklists/)).

### **2.6 PhD Committee Composition**

A PhD committee includes at least five members. No less than four of these must be South Dakota School of Mines faculty members: (1) the Major Professor, (2) the GDR, and (3) at least two additional full-time faculty members. The student and Major Professor may choose to include additional committee members, which may or may not be SD MINES faculty, as appropriate. In all cases, the majority of the committee must be SD MINES faculty as defined in General Degree Requirements of the Catalog.

### **2.7 PhD Examinations**

Candidates for PhD degrees must fulfill all degree requirements of the graduate office and GGE program. When the student has substantially completed the required 36 credits of coursework for the PhD, and before work on the dissertation research commences in earnest, the student must complete a combined examination composed of two parts: a **qualifying** examination and a **comprehensive** examination. After the successful completion of both exams, the student will be admitted to PhD candidacy. Additional information on qualifying and comprehensive examinations is outlined in the Graduate Education Policies GEP VIII. PhD Degree Requirements.

The student must make a request to the student's committee to take the Qualifying and Comprehensive examinations no later than two months prior to the examination. The department requires that the qualifying examination must take place within one working week. The comprehensive examination must be held no sooner than five working days and no later than 10 working days after the completion of the qualifying exam.

If the student has not completed all requirements for the PhD degree by the fifth year following the comprehensive examination, his/her active candidacy status will be automatically terminated and the comprehensive examination must be repeated.

### 2.7.1 Qualifying examination

The qualifying examination will consist of a written examination covering the student's field of study and related subjects. It will be prepared by the student's advisory committee, with potential suggestions from any faculty member from whom the student has taken a graduate course. The examination may be scheduled for spring and fall semesters only, and may not take place during the last week of classes or the week of final examinations.

The results of the qualifying examination must be determined prior to the comprehensive examination and should be reported to the student as soon as possible following the completion of the exam. Results of this Qualifying Exam must be filed with the Office of Graduate Education by the department or program within one week of completion of the exam.

The qualifying examination will consist of three parts (General, Specific Topic 1, and Specific Topic 2) all of which have equivalent weight and must be completed within one working week. For students in the **Geology Specialization**, the General part of the qualifying exam will include **General Geology**. Specific topics will be chosen by the student with approval by the student's committee; examples are listed below. A student may propose hybrid fields with other disciplines if approved by his or her graduate committee.

- Structural Geology
- Sedimentation/Stratigraphy
- Paleontology
- Igneous/Metamorphic Petrology
- Economic Geology/Mineral Exploration
- Geophysics/Geodynamics
- Geospatial Analysis/Geocomputation
- Petroleum Geology
- Groundwater/Hydrology

For students in the **Geological Engineering Specialization**, the General part of the qualifying exam will include **Geological Engineering, Geology, and Fundamentals of Engineering**. Specific topics will be chosen by the student with approval by the student's committee; examples are listed below. A student may propose hybrid fields with other disciplines if approved by his or her graduate committee.

A student may substitute successful completion of the Fundamentals of Engineering (FE) examination for one of the three parts.



- Groundwater
- Engineering Geology
- Petroleum Engineering
- Mineral Exploration/Production
- Hydrology and Hydraulic Engineering
- Geophysics
- Geochemistry
- Rock Mechanics
- Geotechnical Engineering

For students in the **Mining Engineering Specialization**, the General part of the qualifying exam will include **Mining Engineering** and **Fundamentals of Engineering**. A student may substitute successful completion of the FE examination for the General part of the exam. Specific topics will be chosen by the student with approval by the student's committee; examples are listed below. A student may propose hybrid fields with other disciplines if approved by his or her graduate committee.

- Rock Mechanics/Geomechanics
- Mine Ventilation
- Mine Planning
- Geostatistics
- Rock Fragmentation
- Mineral Economics
- Engineering Geology

### **2.7.2 Comprehensive examination and admission to candidacy**

The comprehensive examination consists of the oral presentation and defense of the student's dissertation research proposal. All PhD students are required to prepare a research proposal for the research to be accomplished for the dissertation. The proposal must be given to the student's committee at least one month before the qualifying examination takes place, so that the candidate's committee may review the proposal to evaluate whether it is defensible. If not, then the student will have an opportunity to resubmit, although this may alter the final dates of the qualifying and comprehensive examinations. After the proposal has been pre-approved by the committee, the graduate student's advisory committee schedules and arranges the written and oral examinations.

The comprehensive exam will last approximately three hours. The student will prepare a 20-30 minute oral presentation of the dissertation proposal to begin the examination. This presentation is open to the public. After the presentation, the student's committee may examine the candidate orally on the proposal itself, on science or engineering topics related to the work to be completed, or on topics from the qualifying examination. The oral examination section must include the student's full committee, and may also be attended by any department faculty, but is closed to the public. The examination is passed if the student demonstrates that the research proposal is workable and worthy of a dissertation, and that he or she possesses the requisite scientific and technical knowledge needed to successfully complete the research. If the graduate student's advisory committee and department head/program coordinator certify that the candidate has passed the comprehensive examination, the signed admission to candidacy

form (see [www.sdsmt.edu/Academics/Graduate-Education/Grad-Ed-Forms/](http://www.sdsmt.edu/Academics/Graduate-Education/Grad-Ed-Forms/)) must be submitted by a committee member to the dean of graduate education for review and approval.

## **2.8 Change of Specialization**

Students may change specializations with a given degree program. This change requires (1) a mutual agreement among the student and the potential Major Professor, (2) formation of a new committee, (3) a new POS, and (4) approval from the Department Head. Students who wish to explore a change in specialization should consult the Graduate Program Director (GPD) to discuss options, implications, and potential resolution strategies.

## **2.9 Change in Degree Program**

Students wishing to change degree programs must submit a complete application for the desired graduate program.

## **2.10 Research Credits**

Graduate students registered for thesis or dissertation research credits are required to perform the research activities outlined by the Major Professor and must complete one of the following during each semester the student is enrolled in research credits:

- Present research at a professional conference.
- Complete an MS proposal defense or PhD Qualifying and Comprehensive exam
- Submit a proposal to an external funding agency
- Submit a manuscript or publish in a scholarly journal.
- Defend a thesis or dissertation.

Additionally, students enrolled in research credits are expected to attend scheduled GGE Friday Seminars ([www.sdsmt.edu/Academics/Departments/Geology-and-Geological-Engineering/Activities-and-Organizations/Seminars-Workshops-Meetings/](http://www.sdsmt.edu/Academics/Departments/Geology-and-Geological-Engineering/Activities-and-Organizations/Seminars-Workshops-Meetings/)).

## **2.11 Data Management Plan**

Field collections of geological material, as well as laboratory preparations of those collections, anchor many research projects in GGE. Preserving such materials and their associated data for posterity and future research is the role of the Museum of Geology. These guidelines have been prepared for graduate students in the department, as well as their advisors, to ensure that the collections generated by active research are secured for the future. The necessary forms are available online (see section 2.1)

### **2.11.1 Materials of Concern**

Graduate students and their advisors should plan for the documentation of specimens cited in research. In general, any physical specimens collected, prepared, and cited in a thesis or dissertation should be deposited in the Museum of Geology as part of the student's work. These may include, but are not limited to:

- Hand samples
- Larger specimens
- Cores and cuttings
- Fossils
- Thin sections and/or other mounted material (e.g., SEM stubs)
- Powders and other preparations

- Images, 3D scans, video and audio recordings
- Field notes (with locality and georeferencing information)
- Lab notes with procedural information for all preparations
- Rock descriptions
- Raw data sheets
- Processed data sheets
- Maps and cross sections
- Memoranda of Understanding and other agreements; permits or letters of permission, and other relevant correspondence
- Other documentary materials generated as part of the research.

### **2.11.2 Materials that are Exempt**

- Collections which are not used or cited in the final thesis/dissertation will not be deposited at the Museum.
- Collections which are cited in a thesis/dissertation, but that are the property of another entity (Federal and other agencies, private land, corporate sponsor, etc.), will revert to the owner of record at the conclusion of the research, unless other agreements have been made and approved in advance.

### **2.11.3 Procedures**

A graduate student whose research will involve collecting and or preparing geological samples should work out a plan with their research advisor and a Museum representative. A form for this available online (GGE Graduate Forms and Checklist) and should be submitted to the Museum Collections Manager at the same time as the Program of Study documents are submitted to Graduate Education. The student should document all ongoing research according to accepted standards and best practices. This includes items listed in the section entitled “Materials of Concern”. As soon as it is reasonably possible, the student will work with the Museum to be trained for data entry and to secure unique catalog numbers for each specimen and documentary record. The student will enter object data into the appropriate databases and add numbers physically to each item, as appropriate. SDSM numbers will be cited in the final thesis/dissertation. Specimens which belong to other entities, but that will be deposited at the Museum, will only be cataloged with the express permission of the owner. Specialized storage needs should be worked out with the Museum as soon as those needs are known. This may include anything from microscopic samples to oversized specimens. It may also include specialized media storage systems. Arrangements for specialized storage costs may need to be made with the GGE department and/or the project supporters.

### **2.11.4 Data Sharing**

Data generated by SD Mines research are generally shared via publication of the thesis/dissertation. The Museum also makes collections data available as appropriate to the public. Embargos and other restrictions on data sharing from Museum databases should be made known by the advisor as soon as possible.

## **2.12 Quality of Theses and Dissertations**

Student theses and dissertations are expected to be of high quality and suitable for publication in peer-reviewed journals. The specific number of publications expected from a given thesis or

dissertation will depend on the specific research or journal selections and expectations of the Major Professor expectations.

### **2.13 Defense Venue**

All graduate defense activities will be held on the South Dakota School of Mines campus. The student will schedule the defense in a specific room that has Audio/Visual equipment, as necessary, and either a chalk board or white board.

### **2.14 Conflict Resolution and Assistance**

Formal grievance processes are available to students from SDSM ([www.sdsmt.edu/Campus-Life/Student-Complaint-Process/](http://www.sdsmt.edu/Campus-Life/Student-Complaint-Process/)). However, students are encouraged to attempt to resolve conflicts in consultation with the Major Professor, GPD, or Department Head, as appropriate.

### **2.15 GTA Awards and Responsibilities**

It is department policy to fund as many Graduate Teaching Assistantships (GTAs) as possible for a student's initial year. During the first year, each student will consult with his or her Major Professor to devise a strategy for obtaining Graduate Research Assistantship (GRA) support for the second and subsequent years.

Most GTAs will lead a laboratory section for a course. This will require working with the faculty member who is the instructor of record for the course to ensure proper dissemination of content and consistent evaluation methods. General guidelines and expectations for GTAs include, but are not limited to:

1. A half-time GTA corresponds to 10 hours of work per week, full-time GTA is equal to 20 hours per week. As part of the load, the faculty in charge of the course may ask you to assist with logistics in the lecture class.
2. GTAs must maintain three hours of regularly-scheduled office hours each week. This schedule must be posted outside the respective GTA's office and supplied to the department secretary each semester.
3. GTAs are expected to embody professionalism during the execution of GTA duties.
4. Labs may include field trips. GTAs may be required to execute the logistical arrangements, as well as serve as drivers during a field trip. Logistical arrangements should be made as soon as possible and may include, but are not limited to:
  - a. Arrange for vehicles through the department secretary as early as possible. If the trip is cancelled, notify the secretary as soon as possible.
  - b. Arrange for drivers (other GTA's) if necessary.
  - c. Provide the department secretary a list of the students who will attend the field trip. Students are not allowed to drive personal vehicles for class field trips.
5. Grade coursework promptly. Grading should be constructive and consistent within a section, as well as among lab sections. GTAs must abide by FERPA regulations regarding the protection of student privacy. A summary of FERPA guidelines and resources is posted on the GGE website.
6. Keep the laboratories and classrooms clean and orderly. Do not revise storage strategies for laboratory materials, unless directed by the faculty.

## **2.16 GRA and Fellowship Awards**

During the first year, each student will consult with his or her Major Professor to devise a strategy for obtaining Graduate Research Assistantship (GRA) or fellowship support for the second and subsequent years of the student's graduate program. It is the responsibility of both the Major Professor and the graduate student to pursue this support. Support includes: stipend, tuition remission, fees, travel for professional conferences and workshops, publication fees, and any other research costs. Students who successfully secure external grants, fellowships, scholarships, or other funding for support costs will not be exempt from department funding, as appropriate. This policy is an effort to reward self-motivated students, rather than deter enterprising students from seeking external support. GRAs must log ACA hours on a monthly basis. Consult the Major Professor for details.

## **2.17 ADA Statement**

Students with special needs or requiring special accommodations must self-identify with the Director of Counseling and Disability Services, Ms. Megan Reder-Schopp, at [megan.reder-schopp@sdsmt.edu](mailto:megan.reder-schopp@sdsmt.edu) or 605-394-6988 at the earliest opportunity.

## **2.18 Academic Misconduct**

Students with **Academic Misconduct**: Students are expected to uphold excellent standards of academic conduct and professionalism. SDBOR Policy 2:33 defines "Academic Misconduct". Students are expected to understand SDBOR Policy 2:33. Instructors and TAs are obligated to report instances of academic misconduct, as appropriate (see Student Code of Conduct, SDBOR Policy Manual 3:4).

## **2.19 SD Mines Adheres to Title IX**

Students are expected to understand and uphold all policies and standards regarding Title IX. These policies and standards are posted online: [www.sdsmt.edu/TitleIX/](http://www.sdsmt.edu/TitleIX/).

### 3 GGE Graduate Student Travel Funding Application

GGE provides resources to support or offset costs associated with graduate student participation in professional conferences and workshops. Applications for these resources are solicited near the beginning of each semester of the academic year. The application form is posted on the GGE Graduate Checklists and Forms webpage ([www.sdsmt.edu/Academics/Departments/Geology-and-Geological-Engineering/Graduate-Education/Graduate-Checklists/](http://www.sdsmt.edu/Academics/Departments/Geology-and-Geological-Engineering/Graduate-Education/Graduate-Checklists/)) and presented here:

#### **GGE Graduate Student Travel Funding Application**

Graduate students may apply to the department to receive funding to offset expenses incurred while attending professional conferences and workshops. While all such funding requests will be considered, those that are backed by equivalent (1:1 match) funding from either the applicant or the applicant's major professor will be given greater consideration. Possible sources of matching funding include registration fees that are waived due to volunteering at the meeting being attended, pending or awarded travel grants from professional societies, etc., travel funds from grant funding (either from the student or their major professor), overhead funds, travel funds from student clubs, or out of pocket funds provided by the student. The total amount of funding received will be based on the total cost of the trip and merit (i.e. whether the student is presenting at the conference and the perceived effort expended to secure matching funds). Applications must be received no later than the end of the second full week of classes of both the Spring and Fall semesters (travel in the summer will be considered in the Spring). Applications must include the following information and supporting documentation:

- Graduate Student Name
- Major professor
- Name of conference, workshop, etc.
- Reason for attendance (i.e. relevance to research, etc.)
- Itemized cost and supporting documentation of the proposed trip
- Amount of requested support for the travel
- Pending and/or secured support for the travel provided by:
  - Graduate student
  - Major professor
- A brief letter of endorsement from the major professor that includes an explanation and affirmation of the funding mentioned above as well as the importance of the trip to the development of the applicant.

Students selected for funding will be reimbursed following the trip and the appropriate state travel forms and documentation must be submitted both prior and after travel in accordance with GGE, SDSMT, and SDBOR policies.

Graduate students must also complete the Student Travel Agreement & Checklist posted on the GGE Graduate Forms and Checklists webpage prior to travel.

## 4 GGE Graduate Program Expectations, Outcomes, and Assessment Plan

The purpose of this assessment is to collect data to be used by the faculty to continually assess the quality of the GGE graduate degree programs. These assessments are not intended for evaluating the success of individual graduate students (Rubric 1) or specific faculty advisors (Rubric 2). GGE Graduate Program-wide expectations are designed to target the following program outcomes in the context of the GGE Strategic Plan and greater professional community:

<b>GGE Graduate Program Outcomes</b>	
<b>A</b>	Students will have technical expertise.
<b>B</b>	Students will be effective communicators.
<b>C</b>	Students will engage in meaningful professional service.
<b>D</b>	Students will impact the profession.

### 4.1 Outcome Rubric 1: Faculty Perspective

GGE administers two rubrics, which specify expectations that demonstrate achievement of the program outcomes from both the faculty and graduate student perspectives. From the faculty perspective, the successful GGE graduate student is expected to achieve criteria I-V listed in the following rubric:

<b>Rubric 1 - GGE Graduate Student Outcomes: Faculty Perspective</b>									
The following rubric will be applied at (1) The proposal defense and (2) The time of degree confirmation for all graduate students. The goal is for 25% of students to achieve a score of at least 2 at the first assessment and 75% to achieve a score of 3 in all categories at the second assessment. Note: MS includes both GGE and Paleontology degree programs.									
4 (Achieved outcome)		3		2		1		0 (did not achieve outcome)	
<b>I. Professional Conference (Outcomes A, B, D)</b>									
PhD	Student delivered an invited oral presentation at a national or international conference	Student delivered an oral presentation at a national or international conference	Student presented a poster at a national or international conference	Student presented at a state or regional conference	Student did not present results at a professional venue.				
MS	Student delivered an oral presentation at a national or international conference	Student presented a poster as a national or international conference	Student presented at a state or regional conference	Student presented at a department or university conference	Student did not present results at a professional venue.				
<b>II. Publication (Outcomes A, B, D)</b>									
PhD	Student is first author on an article published or accepted for publication in a high-impact journal (IF $\geq$ 1)	Student is co-author on an article published or accepted for publication in a high-impact journal (IF $\geq$ 1)	Student is an author or co-author on a manuscript submitted to a high-impact journal (IF $\geq$ 1)	Student is an author or co-author for article having IF<1	Student did not author/co-author a publication				
MS	Student is author or co-author on an article published or accepted for publication in a high-impact journal (IF $\geq$ 1)	Student is an author or co-author on a manuscript submitted to a high-impact journal (IF $\geq$ 1)	Student is an author or co-author for article having IF<1	Student is author or co-author on non-reviewed report (published/submitted)	Student did not author/co-author a submitted manuscript				
<b>III. Seek External (outside of South Dakota School of Mines) Funding/Support (Outcomes A, B, D)</b>									
	Student was awarded a fellowship with full support (at least stipend and full tuition for at least one full calendar year) from an external agency.	Student submitted a proposal for a fellowship with full support (at least stipend and full tuition for at least one full calendar year) from an external agency.	Student was awarded a scholarship application to an external agency.	Student submitted a scholarship application to an external agency.	Student did not submit any scholarship or fellowship applications to an external agency.				
<b>IV. Participation in professional organizations (Outcomes B, C, D)</b>									
	Student is a member of a national or international professional society	Student is a member of a regional or state professional society	Student is an officer for at least one GGE or University club	Student is a member of at least one GGE or University club	Student is not a member of any professional society or club				
<b>V. Service (Outcomes A, B, C, D)</b>									
PhD	Student led national or international level professional service activities	Student participated in national or international level professional service activities	Student led GGE or local service activities	Student participated in GGE or local service activities	Student did not participate in any service activities				
MS	Student participated in national or international level service activities	Student led local service activities	Student led GGE service activities	Student participated in GGE or local service activities	Student did not participate in any service activities				
<b>Comments:</b>									

### 4.2 Outcome Rubric 2: Graduate Student Perspective

From the graduate student perspective, the successful GGE program is expected to achieve criteria I-III listed in the following rubric:

<b>Rubric 2 - GGE Graduate Student Outcomes: Graduate Student Perspective</b>				
The following rubric will be applied at (1) The proposal defense and (2) Following degree confirmation for all graduate students. The goal is for 75% of program items to achieve a score of at least 3 in all categories for both assessment applications.				
4 (Achieved outcome)	3	2	1	0 (did not achieve outcome)
<b>I. Program web-based advertisement (Outcomes A, C, D).</b>				
Faculty expertise is accurately described.	Faculty expertise descriptions are mostly accurate.	Faculty expertise descriptions are moderately accurate.	Faculty expertise descriptions are mostly inaccurate.	Faculty expertise descriptions are entirely inaccurate.
Research facilities are accurately described.	Descriptions of available research facilities are mostly accurate.	Descriptions of available research facilities are moderately accurate.	Descriptions of available research facilities are mostly inaccurate.	Descriptions of available research facilities are entirely inaccurate.
<b>II. Major Professor (MP) and Committees (Outcomes A, B, C, D)</b>				
MP is readily available and always provides timely guidance.	MP is mostly available and usually provides timely guidance.	MP is sometimes available and sometimes provides timely guidance.	MP is mostly unavailable and generally does not provide timely guidance.	MP is systematically unavailable and does not provide timely guidance.
All committee members* provide timely and relevant guidance.	Most committee members* provide timely and relevant guidance.	Some committee members* provide timely and relevant guidance.	Few committee members* contribute timely or relevant guidance.	The committee* contributed negligible guidance.
MP placed a high priority on facilitating integrations with external specialists in the MP's field of expertise.	MP placed a moderate priority on facilitating integrations with external specialists in the MP's field of expertise.	MP placed a low priority on facilitating integrations with external specialists in the MP's field of expertise.	MP made little attempt to facilitate integrations with external specialists in the MP's field of expertise.	MP did not attempt to facilitate integrations with external specialists in the MP's field of expertise.
MP or student provided full external support*, other than one year of TA support.	Both MP and student submitted proposals for full external support*, other than one year of TA support.	Either MP or student submitted proposals for full external support*, other than one year of TA support.	Either MP or student submitted proposals for partial external support*, other than one year of TA support.	Neither MP nor student attempted to acquire full support*.
<b>III. GGE Graduate Degree Perception (A, B, C, D)</b>				
Degree program exceeded my expectations.	Degree program met my expectations.	Degree program met most of my expectations.	Degree program met few of my expectations.	Degree program failed to meet my expectations.
<b>Comments:</b>				

\*Excludes MP.

\*Full support includes competitive stipend, maximum allowable tuition and fees, and all necessary travel and research costs.

Completed rubrics should be submitted to GRP, who will supply Cleo with copy for students file.

### 4.3 Mapping outcomes to required graduate courses via the rubric criteria

	<b>Outcomes and Rubric 1 Criteria</b>				
	<b>I (Outcomes A,B,D)</b>	<b>II (Outcomes A,B,D)</b>	<b>III (Outcomes A,B,D)</b>	<b>IV (Outcomes B,C,D)</b>	<b>V (Outcomes A,B,C,D)</b>
GEOL700	x	x	x	x	x
GEOL808	x	x	x	x	x
GEOL798	x	x	x		
GEOL898	x	x	x		

### 4.4 Outcome sustainability and relevance

GGE will evaluate the outcomes and ensure that they remain relevant and aligned with student, workplace, and societal needs. Outcome sustainability and relevance will be addressed annually via Rubric 1 (I-V) and Rubric 2 (III), in consultation with the GGE Advisory board. Note that Rubric 1 is directly mapped to evaluation by the greater professional community.