

Meaning, Quality and Integrity of the Geology MS Degree (2014 Assessment Report)

Meaning of the Geology Master's Degree:

Expectations for Entering Students

Unconditional admission to the program is contingent on the following expectations:

- A Bachelor's degree in Geology or a closely related discipline (e.g., Geotechnical Engineering, Hydrology, Geophysics, Environmental Science) from an accredited institution, with a minimum grade-point average of 3.0 in Earth Science courses, and a 2.5 grade-point average in related science and mathematics courses;
- Satisfactory performance on the Graduate Record Examination Aptitude Test with an expected score in the 50th percentile or better on the verbal and quantitative components;
- Two letters of recommendation;
- A one-page personal statement of interest, including research and career aspirations;
- A minimum of 36 quarter units of undergraduate Earth Science-related coursework is required to receive unconditional acceptance into the Master's program.
- Availability of faculty supervisor with expertise consistent with the applicants stated interests

Preparation for Future Careers in Geosciences

A Master's degree in Geology greatly enhances the job opportunities and career advancement for Earth scientists with BS degrees. We target both working professionals and traditional graduate students (i.e., those finishing BS degrees and perhaps seeking a stepping stone to a PhD program). Both cohorts would benefit equally from our thesis-based Master's program with an affordable fee structure. Course scheduling will accommodate both groups; e.g., afternoon and evening classes with many laboratories and field trips offered on weekends.

Skills and Knowledge Developed by the Program

Our Master's program in Geology prepares graduates for employment in all fields of Geological Science, and teaching at secondary and community college levels. Emphasis is placed on applied skills demanded by potential employers. Fundamental to the program is a thorough understanding of basic geologic principles rooted in field and laboratory experiences. The geologic framework provided by the M.S. degree will enable graduates to meet the intellectual challenges of their professional or academic careers and assume leadership roles in their profession. The program is sufficiently flexible to meet student interests in the application of geology to the solution of hydrologic, geophysical, environmental, geoengineering, or resource extraction problems facing our society. As a polytechnic university we are dedicated to the "Learn by Doing" philosophy and stress practical interactions between students, faculty and industry/government professionals.

Program Quality:

Student Preparation For Post-Graduate Careers

To achieve the learning outcomes listed below, students are required to complete course work (GSC 400 and GSC 500 level classes) and Thesis research units (GSC 600 level classes) at a minimum grade point average of 3.0. Requirements for the MS degree include:

- A minimum of 45 quarter units; at least 31 units must be in 500-600 level courses
- A grade point average of 3.0 (B) or better must be maintained in all upper division undergraduate and graduate classes.

- The Graduation Writing Test (GWT) must be passed prior to Advancement to Candidacy.
- An acceptable thesis must be completed and submitted in accordance with university regulations.
- An oral thesis defense must be successfully completed.

Pedagogical Techniques and Faculty Expertise

The Geology MS curriculum balances classroom theory, modern technology and laboratory application with field experiences that incorporate industry-standard equipment, and offers opportunities for faculty-mentored research. We have a strong record of obtaining state-of the art equipment through faculty research grants. Students gain valuable and practical skills utilizing such equipment individually and in teams. Our applied approach to learning and career training is directed by faculty who can provide personal guidance specific to each student. Much department effort goes toward recruiting and retaining the highest quality faculty who are current in their field.

Learning Outcomes

Learning outcomes for the Master's program are at a significantly higher level than those for the BS Geology degree. One particular difference is the strong emphasis on scientific research and the requirement for an oral defense and written thesis document.

Graduates from the Geology Master's degree program should be able to:

1. Participate effectively in seminar-style discussions of current Geoscience topics
2. Synthesize details of published Geoscience literature and present oral synopsis to graduate peers and faculty
3. Utilize contemporary equipment, laboratory techniques and computer technology to solve geologic problems
4. Develop and present scientific proposal for Master's thesis
5. Conduct original research related to Master's thesis
6. Write Master's thesis document
7. Defend results of Master's thesis research with a formal oral presentation to graduate peers and thesis committee

Program Integrity:

The Geology MS program is still in its infancy (Year 2) so we do not have a formal Assessment Plan in place at this time. Most efforts have been directed toward implementing the program, developing course content, teaching the program, focusing graduate students on their research, and working out the many logistical glitches related to course scheduling, admissions, fee structure, financial aid, and academic advising. We have learned much from this process and will build on our experiences during the ongoing semester conversion

Although no formal assessment data has been gathered and tabulated, we are pleased with our students' ability to meet the learning outcomes listed above. One important measure of the program success is that 5 of 9 of our inaugural class will graduate by the end of summer quarter 2014. Four of these students have been placed in well-paying jobs in the local geoscience industry. The fifth student is entering a PhD program at Baylor University. Other measures? Approximately 85% of our current graduate students, numbering about 27, are making good progress toward degree. I am very pleased with Geology faculty efforts to develop meaningful MS projects for each student.