Assessment Plan

for the

Graduate Program

Department of Geological Sciences

California State University, Hayward

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Assessment Plan Outline

Department of Geological Sciences
California State University, Hayward

Assessment of our graduate program is a continuous process with the goal of maintaining a high-quality program to the Geological Sciences despite limitations imposed by budget cuts and lack of permanent faculty positions. Our field of geology is broad, and involves the application of a great variety of techniques (both laboratory, computer and field based) that must be assessed on an ongoing basis in order to prepare our students for professional work in the geological sciences.

Our plan has 3 parts: 1) Reviews of specific learning activity by students, 2) Faculty evaluation of a Master's Thesis (required from all graduate degree candidates) plus evaluation of a thesis defense, and 3) Evaluation of a dossier compiled by graduate students, documenting their written accomplishments during their graduate study here.

1. Specific learning activities: All students are required to complete specific learning activities both in upper-division undergraduate courses (detailed in our undergraduate assessment plan) and in graduate classes, detailed later in this document. All students are required to meet frequently with their advisors to review their achievements. In addition, all graduate students meet with their advisor frequently to discuss their research since our graduate program is strongly research oriented. Students are encouraged to present results of their research at regional, national, and international meetings to obtain independent peer review, and to exchange ideas with fellow earth scientists.

2. Faculty review of Master's Theses: Every graduate student who is admitted to the program has a faculty advisor to guide him/her through the program. Once a student is ready to commence research, the Chair of the Department, in consultation with the student and other faculty, will guide the student during his/her research phase. Finally, the committee will appoint a Thesis Committee, and a Chair of this committee, who will guide the student in the preparation of a Master's Thesis and

eventual preparation of a manuscript and submission to a peer-reviewed journal (although this is not a requirement to obtain the degree). Once the thesis has been written, and a first draft is available, the student will present his/her work to our Geology Club, followed by a Q and A session. Subsequently, the faculty committee will meet with the candidate in closed session to assess the thesis work, and to advise the student on changes that may be necessary to improve the manuscript. This review is probably the most effective assessment tool we have to assay the overall achievement of the student and the overall effectiveness of our graduate program.

3. Evaluation of student dossier: Every admitted graduate student will be asked to compile a dossier consisting of written material prepared by the student in graduate geology classes. Compilation of this dossier is an on-going effort, but not an additional burden since the written materials will be prepared by the student while taking graduate classes. Such written materials will consist of term papers (required in all graduate classes) but can also consist of maps and stratigraphic columns (both paper or cyber versions), disks containing PowerPoint presentations, graphs showing the distribution of chemical/physical/micropaleontological properties against time or depth, etc.

Department faculty will monitor these products on an on-going basis to update and improve learning goals, and to adjust the program, where and when necessary, to reflect changes in the practice of geology. This may involve implementation of new courses, changing or eliminating existing courses, and other changes as deemed necessary.

Specific Learning Goals in Graduate Geology Courses

Student Learning Goals in: Quaternary Geology (GEOL 6300)
Students should know:

- evolution of climate and landforms during the Quaternary
- climate oscillations on decadal to millenial time scales
- natural climate variabilities and its impact on human populations

Students should be able to:

- identify landform associations developed under variable climate conditions during the Quaternary
- use techniques to determine age relationships of various landforms
- write a term paper on a Quaternary topic of their choice

Student Learning Goals in: Groundwater (GEOL 6320)
Students should know:

- methods of groundwater resource evaluation
- multi-dimensional flow evaluation
- computer models to predict groundwater yield

Students should be able to:

- apply resource evaluation methods to specific problems
- use computer models to predict aquifer yield
- write a report on groundwater availability and quality in a specific area

Student Learning Goals in: Geotectonic Development of California (GEOL 6405)
Students should know:

- petrology, stratigraphy and structure of California
- the state's geologic history in terms of plate tectonics

Students should be able to:

- interpret geologic maps in terms of the region's geologic history
- explain the geologic history of specific regions to visiting peer
- write term paper/field-trip reports of areas visited during the course

Student Learning Goals in: Advanced Sedimentary Geology (GEOL 6415)
Students should know:

- sedimentary-rock petrogenesis
- depositional environments
- facies models

Students should be able to:

- use basic analytical techniques
- use the petrographic microscope in the analysis of sedimentary components and lectures
- use SEM and other techniques as appropriate
- write a term paper including maps and photomicrographs

Student Learning Goals in: Advanced Topics in Geology (GEOL 6620)

Students should know:

- the topic of the course selected by the instructor

Students should be able to:

- write a term paper on the topic selected by the instructor, including correct literature preferences, and references to appropriate internet resources
- give class presentations

Student Learning Goals in: Advanced Topics in Geology with Laboratory (GEOL 6621)

Students should know:

- the topic selected by the instructor

Students should be able to:

- complete laboratory analyses as assigned by the instructor
- write a term paper or report based on materials assigned by the instructor and the results of the laboratory analyses.

Student Learning Outcomes in: Graduate Seminar (GEOL 6811)

Students should know:

- Literature pertaining to the topic selected by the instructor
- How to use the library and the internet as a resource of information

Students should be able to:

- give oral presentations to the class
- use modern presentation techniques such as PowerPoint
- write a term paper on a specific topic, including literature and internet sources, and give a limited-in-time presentation, following the format of professional societies.

Student Learning Goals in: University Thesis (GEOL 6910)

Students should know:

- details of their research topic
- how to generate data in their specific research area
- how to interpret these date

Students should be able to:

- pick a research topic
- devise research plans and strategies based either on field work or laboratory analyses, or a combination of both
- write and defend a Thesis, using the university format
- if possible, convert the Thesis to a manuscript to be submitted to a peer-reviewed journal, or an organizational report.

Over-arching Assessment Tool:

The University Thesis is probably the most important assessment tool since it incorporates everything the student has learned during his/her stay at CSUH, including writing. Any strengths or weaknesses that become apparent in a thesis can then be used to modify the graduate program accordingly.