

### **Geochemistry B.S. Revisions – Approved by APC, 10/18/13**

During the past two years we have made modifications to the program of study for this major in response to the extended discussions during the 2011 program review and to the changes to laboratory facilities at Oswego. The cardinal modification was the development of a set of three courses to supplant the haphazard pair of course that had been used previously for geochemistry. The institution of these courses requires (superficial) reconfiguration of the Geochemistry B.S. program.

The reason for the change to the geochemistry offerings is predicated mainly on the learning goals we want our graduates to achieve. We find the broad, sweeping “survey of geochemistry” course that most institutions instruct to be ineffective relative to our learning goals. We think that this approach minimizes the potential to give students meaningful learning experiences and is unsuitable to pursuing more advanced topics in a systematic and thoughtful way. To this end, we favor a model where a group of interrelated courses are cycled through. What specific “flavor” of geochemistry any student is able to study depends somewhat on timing, but what students receive, regardless of the course, will not be a shallow treatment.

The current Geochemistry B.S. program includes as part of a geochemistry component the two courses: GEO 475 (“Geochemistry”) and GEO 301 (“Environmental Geology for Majors”). We have been instructing GEO 475 (also listed as CHE 475) since 2005 as a solid-Earth geochemistry course, rather than its intended generic description. We have instructed versions of GEO 301 for a few years, making this into an Earth-surface geochemistry offering. In spring 2011 Tomascak piloted (as GEO 390) an isotope geochemistry course, distinct from the other two courses in the level of depth we applied to specifics of both radiogenic and stable isotope problems.

It is on this foundation that we developed the courses GCH 436 (Solid Earth Geochemistry), GCH 437 (Earth Surface Geochemistry) and GCH 438 (Isotope Geochemistry). All courses were approved by the Undergraduate Curriculum Council earlier in spring 2013. Students will still need to take two geochemistry courses for the major, but they will be able to choose which two of the three they prefer. One of the three GCH courses will be consistently offered each year, so even transfer majors or late major-changers will be able to complete the major without the concern of missing a GCH offering. The addition of GCH 438 (3 cr) to the choices changes the total credits in the major from 70 to 69-70, as noted.

In addition to this change, we have broadened the option for the entry-level Geology course, to bring this in line with what the Geology degree tracks are permitting. This is intended to enhance the possibility of attracting majors from the pool of undecided science-interested freshmen.

These changes have no impact on the resources that either the Earth Sciences or Chemistry departments put in to courses in this major. These changes were presented to both departments and there were no objections to the revision.

**Geochemistry B.S. (current) 70 cr**

<b>A. Core Requirements</b>	<b>34 cr</b>
Che 111 - General Chemistry	4
Che 212 - General Chemistry	4
Che 341 - Physical Chemistry	3
Che 451 - Inorganic Chemistry	3
Che 451 - Inorganic Chemistry Laboratory	1
Geo 100 - Physical Geology	3
Geo 100L - Physical Geology Laboratory	1
Geo 310 - Mineralogy	4
Geo 301 - Environmental Geology for Majors	4
Geo 475 - Geochemistry	4
Gch 494 - Capstone in Geochemistry	3

**B. Elective Requirements 20 cr**

Electives under advisement, but must include at least 13 hours at the 300- or 400-level and at least 3 hours from chemistry and at least 3 hours from geology.

**C. Cognate Requirements 16 cr**

Mat 210 - Calculus I	4
Mat 220 - Calculus II	4
Phy 112 - General University Physics I	4
Phy 213 - General University Physics II	4

**Geochemistry B.S. (proposed) 69-70 cr**

<b>A. Core Requirements</b>	<b>33-34 cr</b>
Che 111 - General Chemistry	4
Che 212 - General Chemistry	4
Che 341 - Physical Chemistry	3
Che 451 - Inorganic Chemistry	3
Che 451 - Inorganic Chemistry Laboratory	1
<b>Select one from the following three:</b>	
Geo 100 - Physical Geology	3
Geo 115 - Environmental Sustainability	3
Oce 100 - Oceanography	3
Geo 101 - Physical Geology Laboratory	1
Geo 310 - Mineralogy	4

<b>choose two:</b>	<b>4</b>
Gch 436 - Solid Earth Geochemistry	4
Gch 437 - Earth Surface Geochemistry	4
Gch 438 - Isotope Geochemistry	3
Gch 494 - Capstone in Geochemistry	3

**B. Elective Requirements 20 cr**

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**C. Cognate Requirements 16 cr**

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