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Weaving the Curriculum Tapestry: Modifying Upper Level Courses to Facilitate Integration across the Geology Program


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Weaving the Curriculum Tapestry: Modifying Upper Level Courses to Facilitate Integration across the Geology Program

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Having observed students' frequent struggles to acquire mastery of content and skills in upper-level geology courses, we noted certain trends: 1) difficulty recalling content/skills previously mastered in introductory courses; 2) difficulty connecting recalled knowledge with new, or deeper, content; 3) lack of organized approaches to problem-solving; 4) deficiencies integrating skills/content mastered in other sciences (physics, calculus, chemistry) and disciplines; and 5) decreasing self-confidence in science and math capabilities. In other words, they fail to weave together the diverse strands that produce a well-educated geoscientist.

Having noted the trends and student distress in the early weeks of upper-level courses as they struggled to keep up with new content and skills, we determined a course of action that includes application of best pedagogy based on educational research. We incorporate a technique of spiraling basic content and skills across the geology curriculum: content and skills introduced in the entry-level geology course are intentionally reviewed and referenced in each upper-level course.

As an example, early in the semester of the Hydrogeology course, students are given an in-class assignment to construct a simple hydrologic groundwater model. Drawing upon their recall of groundwater content from the introductory course, they produce a group depiction of a watershed system. Students are then challenged to list attributes of their system and explain effects of a precipitation event (or other impact). This exercise reveals misconceptions and gaps in understanding, allowing for prompt corrective instruction. Students are primed to conceptualize the recharge process and grasp the dynamic nature of a watershed system over time.

Rather than simple review, brief in-class group activities prompt recall of prior knowledge which is then woven with new content. This gives students the opportunity to connect prior knowledge with new material and build self-confidence in their abilities to acquire new skills and information.

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Session No. 248--Booth# 132

[Geoscience Education \(Posters\)](#)

George R. Brown Convention Center: Exhibit Hall E

8:00 AM-6:00 PM, Tuesday, 7 October 2008

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