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### GEO 491.01: Special Topics - Advanced Structural Geology

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GEO 491 01  
Advanced Structural Geology  
Spring, 2014  
University of Montana

James Sears

This research-based seminar course will investigate the Neogene tectonic evolution of southwest Montana in reference to a continental-scale Miocene river system that was structurally deformed in the Basin and Range Province and in the shoulder zone of the Yellowstone hotspot track.

Students will work in teams to research one of the following specific topics:

1. Using the modern Amazon River basin as a datum to assess the grand-scale tectonic uplift and disruption of the Miocene drainage basin.
2. Assessing the significance of the Paleogene Renova Formation as a fluvial link to the southern Great Basin that was disrupted by the Yellowstone hotspot track.
3. Comparing the compositions of Neogene Sixmile Creek Formation fluvial clastics to possible source rocks in central Nevada and Utah to assess timing of tectonic disruption of the fluvial system.
4. Constructing balanced and restored cross-sections along the length of the Miocene river valley in Montana and Idaho to assess the amount and timing of late Neogene crustal extension in the region.

Each student will develop an individual identifiable component of the above group projects.

Based on their research, each team of students will present an abstracted poster at the April 11, 2014, UMCUR conference at the University of Montana. Abstracts are due Feb. 20, 2014. Each student will present the group's poster for an equal length of time during the poster session.

Each team will also present a seminar on their topic to the class. Each student will participate significantly in the presentations.

The course will include two field trips – a day-trip to the Bitterroot Valley, and a weekend trip to SW Montana to make field observations.

Grades will be assessed according to student attendance, participation in the seminar projects, and the quality of their research.