Offered in the Fall of 09

Instructor: Dr. Tom Wilson

GEOLOGY 554
Environmental & Exploration Geophysics II
Rm 419 Brooks Hall

Geology 791 covers basic quantitative theory, methods of interpretation and modeling of reflection and refraction seismic, and ground penetrating radar data. Oil and gas exploration and development activities rely heavily on seismic imaging technologies as the key methods for identifying reservoirs and assessing reservoir potential and compartmentalization. Seismic methods are also receiving the interest of the coal industry as a potential method for locating abandoned mines and coal seam discontinuities. The uses of ground penetrating radar data are restricted to near-surface, primarily environmental, assessments.

The course is not purely interpretational in focus. Fundamental scientific issues are considered in a quantitative format while at the same time the course provides a comprehensive introduction to computer interpretation and modeling procedures. Although this course concentrates more on geophysical applications to oil and gas exploration, seismic and GPR methods have widespread environmental uses: for example, these methods are often used to map unconsolidated glacial sediments, bedrock, and the water table; to locate caves and abandoned mine workings; to evaluate soil properties, and locate dissolution features in near surface karst terrain. Many papers on the reading list cover environmental topics.

The class is divided into lecture and computer lab components (about 50% each). The grade is based on problem sets (30%), computer labs (30%), term project (15%) and mid-term and final exams (10% and 15%, respectively).

Majors outside geology are welcome and encouraged to consider Geol 791. Material covered in the class provides experience useful to engineering and physics majors interested in finding employment with oil and gas exploration, environmental, engineering, and geotechnical companies. Permission required.

If you have any questions, send e-mail to tom.wilson@mail.wvu.edu. Also visit the class website at http://www.geo.wvu.edu/~wilson/geol554.htm