

**Seismic Modeling** (3 credit hours): Use of ray theory, finite difference, finite element, and pseudo-spectral analysis techniques, scaled physical modeling in simulating seismic wave propagation. Emphasis on understanding wave phenomena for hydrocarbon exploration.

#### **Course Outline**

1. Introduction
2. Model building and ray theoretical modeling using GXII
3. Introduction to finite difference methods
4. Acoustic modeling
5. Overview of reflectivity methods
6. Finite difference elastic modeling and computer implementation
7. Pseudo-spectral algorithm theory
8. Staggered grid solutions