

**Introduction to Reservoir Geophysics** (3 credit hours): The geostatistical concepts and workflows to quantitatively integrate 3D seismic data into the reservoir model are discussed. Emphasis is placed on geostatistical deterministic and stochastic methods to construct 2D and 3D velocity models for seismic depth conversion and the use of seismic attributes (acoustic impedance) to predict reservoir properties. The computer workshop reinforces the discussions and provides hands on experience using geostatistical software tools to integrate seismic acoustic impedance to predict porosity, build a velocity model for seismic depth conversion, and use stochastic modeling tools to assess model uncertainty.

#### **Course Outline**

1. Introduction to geophysical characterization for reservoir modeling
2. Data quality control and data analysis methods
3. Spatial analysis, modeling, and exploratory data analysis
4. Variogram modeling
5. Kriging, the geostatistical interpolation mapping method
6. Collocated cokriging, the geostatistical data integration method
7. Enhanced porosity prediction using seismic acoustic impedance
8. 2D seismic depth conversion
9. 3D velocity modeling and depth conversion
10. Stochastic modeling for Risk Analysis
11. Computation of Risk maps