

## N485: Advanced Seismic Interpretation

Instructor(s): Rachel Newrick

## Format and Duration

Classroom - 4 Days

Virtual - 8 Sessions

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### Summary

**Business Impact:** This course is designed to **strengthen key interpretation skills** and **add tools to the interpreter's workflow**. The strengthening of these skills and added tools will enable participants to improve success rates and decrease drilling risks and costs by reducing structural, stratigraphic and fluid uncertainty.

Topics include the creative use of seismic attributes to extract stratigraphic detail and rock property information from 3D data, quantitative interpretation techniques applicable to unconventional reservoirs, and tools for reservoir management. A key theme is understanding the importance of geophysical data and consciously communicating the value of these data to the team.

### Learning Outcomes

Participants will learn to:

1. Evaluate phase, bandwidth, and other factors affecting seismic resolution.
2. Investigate the use of workstation tools to perform jump-correlations, create synthetic seismograms, construct structural and stratal slices, and perform horizon flattening and auto-tracking to construct efficient interpretation workflows.
3. Evaluate the creative use of color and other display parameters to extract maximum stratigraphic detail from 3D data.
4. Assess the use of seismic attributes for structural and stratigraphic interpretation as well as reservoir characterization, and select appropriate attributes to meet project objectives.
5. Evaluate the potential for direct hydrocarbon indicators.
6. Design optimized interpretation workflow approaches to estimate reservoir properties such as net pay, porosity, pore volume, and estimated ultimate recovery.
7. Assess the roles of cross-well imaging, VSP and micro-seismic data in reservoir characterization.
8. Investigate the role that pre-stack inversion can play in characterizing reservoirs.
9. Examine converted wave technologies and explain how they might be utilized to improve seismic imaging and reservoir characterization.
10. Demonstrate the importance of geophysics and consciously communicate the value and necessity to their team.

### Training Method

This is a classroom or virtual classroom course comprising a mixture of lectures, discussion, case studies, and practical exercises.

### Who Should Attend

Practicing seismic interpreters who wish to improve their interpretation skills and gain awareness of interpretation workflows focusing on stratigraphic interpretation and unconventional reservoir analysis.

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## Prerequisites and Linking Courses

This course builds on skills introduced in N085 (Introduction to Seismic Interpretation). Participants will benefit the most if they have attended N085, or a similar course, and have experience interpreting 3D data using a seismic workstation.

## Course Content

Recent advances in seismic technology now provide seismic interpreters with advanced tools for risk and resource assessment, and for characterizing reservoirs. The materials covered in this class are designed to help practicing interpreters construct interpretation workflows to extract the information necessary to make good business decisions and to convey their ideas to management. Topics covered are summarized below.

### Interpretation skills

- Seismic resolution
- Stratigraphic interpretation
- Attribute workflows
- Evaluate the potential for DHIs
- Making sense of FLT's ("Funny Looking Things")
- Synthetic seismograms
- 3D visualization
- Export / transferring data from one package to another and having an awareness of pitfalls (e.g. datums, polygons, maps, data qc)
- AVO inversion, structural and spectral attributes, and multivariate analysis

### Unconventional reservoir applications

- Rock property prediction from seismic data
- Incorporating micro-seismic data into the interpretation

### Presenting your ideas to team members and management