Advanced Seismic Data Processing and Interpretation

Course Price

£3050

Course Description

With the presence of new data acquisition techniques, like e.g. VSP, hole-to-hole, multi-component, and ocean bottom cable, also new processing methods have to be developed. Existing and new data sets will be exploited for optimal information retrieval: in addition to the conventional P-waves also the S-waves will be investigated and in addition to the kinematic properties, i.e. traveltimes for velocity and structural determination, also the dynamic properties, i.e. phase and amplitudes, for lithology and/or direct hydrocarbon indication will be investigated. Anisotropy, where present, should be taken into account and can be exploited for a.o. fracture orientation and density and time-to-depth conversion. The availability of other types of data like geological data and well data, in a production environment, should be properly integrated in inversion studies to initialize and constrain the results. This course deals with advanced processing methods that are often carried out as part of a special study and may involve the integration of data acquisition, processing and interpretation as well as petrophysics, production geology and reservoir engineering. The topics that will discussed cover a wide spectrum and are representative for what has become feasible nowadays.

Course Objectives

At the end of this course the participants will have a working knowledge of the full range of representative special processing methods, which he may carry out himself and/or supervise. He or she is fully capable to account for the geophysical input in multi-disciplinary teams.

Who Should Attend

Geophysicists – processing and interpretation – who are actively involved in advanced or special seismic data processing, e.g. as a member of a multi-disciplinary team. Earth scientists who are a member of a multi-disciplinary team will also benefit from this course.

Course Content

Stress-strain relationships
The wave equation
Wavefield extrapolation
Anisotropy
Migration, time migration, depth migration and true-amplitude migration: theory and algorithms
DMO (dip moveout) and PSI (pre-stack imaging): theory and algorithms
Velocity model building and updating: theory and algorithms
VSP and hole-to-hole seismic: acquisition and processing
Multi-component seismic, shear seismic and anisotropy: acquisition and processing
OBC (ocean bottom cable) and OBS (ocean bottom system): acquisition and processing
Design and assessment of different acquisition geometries
AVO (amplitude versus offset) and AVA (amplitude versus angle): theory and processing
Inversion: overview of different methods
4D or time-lapse seismic: feasibility and requirements and processing

CPD Unit

Continuing Professional Development

35 HOURS CPD