Aspen Subsurface Science & Engineering

Training Courses

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DATA MANAGEMENT AND INTEROPERABILITY

Aspen Epos Applications and Aspen Epos Service - Epos Data Management for Technologists

Objective:
This course is designed to teach students how to use AspenTech tools for loading, QCing, and managing well, seismic, and Interpretation data. This course is composed of three separate courses:

- Epos Essentials
- Loading and Managing Well Data
- Loading and Managing Seismic and Interpretation Data

Each course can be taught as a stand-alone or all three can be taught as one comprehensive course.

Duration:
Epos Essentials: Half day
Loading and Managing Well Data: 2 days
Loading and Managing Seismic and Interpretation Data: 2 days

Prerequisites:
Background/familiarity in data loading terminology and concepts. Understanding of basic geoscience concepts.

Who should attend:
Technologists, processors, geoscientists and new users of our technology who load and manage data.

Contents:

- Epos Essentials: Introduction to Epos Infrastructure, Data Model, and Terminology
- Getting Started
- Loading Well Data
- Managing Well Data
- Loading 3D Poststack Data
- Creating a New Project
- Loading 2D Seismic Data and Creating Line Geometry
- Loading 2D and 3D Prestack Seismic Data
- Loading Topography (Land) Data from SEG-Y Trace Headers
- Exporting Seismic Data
- Importing and Exporting Interpretation Data
- Epos User - Concept and Control of Data Access
- Sharing Data Between Studies
- Plotting
- Backup and Restore

Aspen Epos Applications and Aspen Epos Services – Loading and Managing Seismic and Interpretation Data

Objective:
This course is designed to teach students how to use AspenTech tools for loading, QCing, and managing seismic and Interpretation data. This course is composed of two courses:

- Epos Essentials
- Loading and Managing Seismic and Interpretation Data

Duration:
Epos Essentials: Half day
Loading and Managing Seismic and Interpretation Data: 2 days

Prerequisites:
Background/familiarity in data loading terminology and concepts. Understanding of basic geoscience concepts.

Who should attend:
Technologists, processors, geoscientists, and new users of AspenTech technology who load and manage data.

Contents:

- Epos Essentials: Introduction to Epos Infrastructure, Data Model, and Terminology
- Getting Started
- Loading 3D Poststack Data
- Creating a New Project
- Loading 2D Seismic Data and Creating Line Geometry
- Loading 2D and 3D Prestack Seismic Data
- Loading Topography (Land) Data from SEG-Y Trace Headers
- Exporting Seismic Data
- Importing and Exporting Interpretation Data
- Epos User - Concept and Control of Data Access
- Sharing Data Between Studies
- Plotting
- Backup and Restore

Aspen Epos Applications and Aspen Epos Services – Loading and Managing Well Data

Objective:
This course is designed to teach students how to use AspenTech tools for loading, QC'ing, and managing well data. This course is composed of two courses:

- Epos Essentials
- Loading and Managing Well Data using Epos

Duration:
Epos Essentials: Half day
Loading and Managing Well Data: 1.5 days

Prerequisites:
Background/familiarity in data loading terminology and concepts. Understanding of basic geoscience concepts.

Who should attend:
Technologists, processors, geoscientists, and new users of AspenTech technology who load and manage data.

Contents:

- Epos Essentials: Introduction to Epos Infrastructure, Data Model, and Terminology
- Getting Started in Epos
    - Creating a New Project
- Loading Well Data
    - Creating a Well Database
    - Importing:
        - Well Parameters
        - Deviation Surveys
        - Well Markers
        - Checkshots
        - Wireline Logs in LAS 2 Format
        - Production Data
        - Raster Data
- Managing Well Data
    - Managing the Amount of Well Data Used in a Working Session
    - Managing Well Domain Conversion Data
    - Managing Log Data
    - Managing Marker Data
    - Well Data Exchange
    - Project Backup and Restore

Aspen Epos OpenGeo SDK

Objective:
Gain the skills necessary to work with OpenGeo, one of AspenTech's development toolkits. The Aspen Epos OpenGeo devkit training teaches the students how to manage data in these domains:

- Epos project study
- Epos survey study (2D and 3D)
- Epos well study
- Project/survey metadata
- Seismic data: 3D, 2D, poststack, prestack
- Seismic interpretation: horizons, faults
- Vertical functions
- Well data

The course consists of a series of presentations that alternate with interactive sessions in which the student learns how to find the information using the OpenGeo navigator or go through examples of coding.

Duration:
4 days. 5 days with well training.

Prerequisites:
Developing experience in C++, basic knowledge of geophysics.

Who should attend
Developers

Contents:

- Epos infrastructure
- Epos logical data model
- Epos OpenGeo devkit architecture
- Epos OpenGeo devkit libraries, structure, API
- Epos OpenGeo devkit navigator
- Epos OpenGeo devkit workflows and examples

Aspen Epos System Administration and Database Management

Objective:
This course is intended for System Administrators and Application Support staff who are responsible for maintaining multi-user, networked Epos environments. Students should achieve the following objectives upon completion of the course:

- Understand the Epos architecture
- Install and configure the software
- Create and administer Epos Databases
- Support and troubleshoot using AspenTech utilities

This course can be combined with the Geolog Site Administration course.

Duration:
3 days

Prerequisites:
Some familiarity with Linux or completion of a System Administration course (Unix and/or Windows). Some exposure to AspenTech products.

Who should attend:
System Administrators and Data Managers responsible for maintaining AspenTech environments.

Contents:
- System Architecture
- Installation
- Uninstall
- Licensing
- Ready for Launch
- Backup and Restore Tool
- Epos Administration
- Epos User Internals
- Epos Databases
- Data Paths
- Files and Directories
- Paradigm Name Service
- Enterprise Deployment
- System and Network Requirements
- Permissions and Security
- System Level and Project Level Backup
- Support Packs
- High Performance Clusters
- Troubleshooting
- Third-Party Server Installation and Configuration
- Epos/Third Party Connectivity Overview

DRILLING

Aspen Geolog Geosteer - Well Directional Steering

Objective:
Geolog Geosteer is a comprehensive toolbox for geologically steering a well through the geology of the subsurface. The correlation between expected or modeled logs, and real-time LWD log curves helps, during drilling, to quantify and qualify the number of adjustments that need to be made to the well trajectory to ensure optimal entry into the reservoir, obtain a precise position of the wellbore relative to the geology, and prevent an early exit from the reservoir. Geolog Geosteer offers an effective way to interpret log data in highly deviated wells and can be done at the rig site or in the office. This course teaches the basics of using Geosteer by guiding the student, step by step, through a typical workflow.

Duration:
2 days

Prerequisites:
To gain the most benefit from this training guide you should be familiar with:

- Geolog
  - Loading data, layouts, modules etc.
- Directional and Horizontal Wells
  - Surveys, wellpaths, position uncertainty
  - Directional drilling issues and constraints
- Basics of LWD Tools
  - Tool types, mnemonics, real-time and memory data
  - Propagation resistivity response
- Wellbore Images
  - Dip picking

Who should attend:
Geoscientists who plan high angle or horizontal wells, are involved in the drilling of high angle or horizontal wells, and participate in petrophysical and structural postmortems of these wells.

Contents:

- Creating a 3D Model
- Preparing Offset Wells
- Planned Geosteer Wells
- Actual Geosteer Well (without Plan)
- Actual Wells
- LWD Images
- Reposts and Output Files
- Resistivity Modeling
- WITSML Real-Time Data Loading (Optional)

Aspen Sysdrill - Advanced Well Planning and Drilling Engineering

Objective:
Introduces the student to the advanced features and functionality of Sysdrill.

Duration:
2 days

Prerequisites:
Students should have a basic familiarity with Windows operating system.

Who should attend:
Geologists, Drilling Engineers

Contents:

- Introduction to Well Planning
  - Getting Started, In Sysdrill, Data Setup
  - Introduction to Planned Wells
  - Creating a Planned Wellpath
- Well Design
  - Well Planning and Engineering, Torque and Drag Analysis, Jar Placement, Hydraulics Analysis, Cementing Analysis, Casing Analysis
- Drilling Operations
  - Survey Management, Sensitivity Calculation, Project Ahead
- Data Exchange Between Databases
  - Importer and Exporter Utilities
- Clearance Analysis
  - Selecting Reference and Offset Wellbores, Running Clearance Analysis
- Appendices: Working with Spreadsheets, Reporting, Basic Plotting, Catalogues, 3D View Summary, Working with Graphs and Plots, Further Help

Aspen Sysdrill - Introduction to Well Planning and Drilling Engineering

Objective:
Introduces the student to the features and functionality of Sysdrill.

Duration:
2 days

Prerequisites:
Students should have a basic familiarity with Windows operating system.

Who should attend:
Geologists, Drilling Engineers

Contents:

- Introduction to Sysdrill
  - Working with the Data Selector, Saving Data, Data Structure, Working with Spreadsheets, Catalogues, Graphs and Plots, and 3D View.
- Introduction to Well Planning
  - Starting Sysdrill, Data Setup, Introduction to Planned Wells, Boundaries and Line Calls, Other Planning Options, and Well Planning Challenge.
- Well Design
  - Well Planning and Engineering
- Drilling Workflow
  - Actual Wellbores, Project Ahead, and Sidetracks
- Data Exchange Between Databases
  - Importer and Exporter Utilities

FORMATION EVALUATION

Aspen Geolog - Advanced Geolog

Objective:
Gain a comprehensive overview of Multimin (probabilistic, or optimizing, petrophysical analysis) and Geolog programming using Loglan and Tcl.

Duration: 5 days

Prerequisites:
Basic knowledge of Geolog

Who should attend:
Experienced Geolog Users

Contents:

- **Multimin** is a software program that provides advanced formation evaluation answers. The program is based on the probabilistic, or optimizing, approach to modelling wireline and rock data. The formation evaluation professional will gain an understanding of the theoretical basis of the optimizing approach to petrophysical interpretation, a good understanding of how to create models in Multimin and how to run optimizing evaluations within the Geolog environment. You will work through several exercises highlighting different modelling challenges, such as bad hole, heavy minerals and secondary porosity.
- **Loglan** is a fully functional programming language which is written, compiled and executed within Geolog. It allows you to develop your own modules, easily accessible from Geolog's Well or Project applications, to perform log processing and many other applications. Learn the basics of the Loglan programming language, how to develop a module using the language, and how to run the module from within Well or Project.
- **Tcl Programming**
  Tcl, the Tool Command Language, is a platform independent easy-to-learn scripting language that is an integral part of Geolog. Learn how to develop programs using Tcl commands and Geolog extensions to create applications that complement the functionality of Geolog.

Advanced Geolog can be made up of:
Multimin - 2 days
Loglan - 2 days
TCL Programming - 1 day
Facimage - 2 days
Thin Bed (Laminated Shaly Sand) Analysis - 1 day
Determin Uncertainty - 1 day

Aspen Geolog – Borehole Image Processing and Analysis

Objective:
Learn to use this Geolog module, an advanced analysis tool kit allowing users to process, enhance, and analyze vendor specific image tools and logs. This training course is designed for users who are new to the borehole image processing and analysis modules within Geolog. It teaches how to process and analyze image logs, and guides you through typical workflows and procedures.

Duration:
2 days

Prerequisites:
A working knowledge of Geolog

Who should attend:
Geoscientists interested in using, processing or enhancing wellbore images, all Geolog users, new users of Geolog Image Log Processing and Interpretation

Contents:

- About borehole imaging in Geolog
- Loading well data
- Well borehole image quality check
- Speed correction
- Image generation
- Borehole Image processing: Utilities
- Borehole Image processing: Postprocessing
- Dip computation and analysis
- Fracture analysis
- Borehole Shape Analysis
- Image analysis
- Automatic texture detection
- Walkout plot and stereonet
- Wireline borehole imaging tools

Aspen Geolog - Deterministic Petrophysical Log Analysis (Determin)

Objective:
Learn how Geolog can be used as a tool for performing advanced deterministic petrophysical well evaluations. Determin is a comprehensive suite of individual deterministic modules that allow the analyst to apply all the major modern petrophysical models in the traditional analysis methodology. All common techniques for shale/clay volumes, porosity, saturation and lithology determination are included. Interactive parameter picking and multi-zone/multi-well analysis provide a rapid workflow for the formation evaluation. Students are also introduced to Loglan, the Geolog programming tool.

Duration:
2 days

Prerequisites:
A working knowledge of the Geolog software, and of basic Petrophysics.

Who should attend:
Geologists, petrophysicists

Contents:

- Determin Overview
- Using the Evaluate module
- Geolog Frequency (Histogram) View
- Geolog Xplot View
- The different types of Xplot functions supplied with Geolog
- Deterministic Petrophysics
- Petrophysics Philosophy
- Parameter Picking
- Deterministic Analysis
- Multiwell Analysis
- Create a new Loglan Program (Geolog programming tool)
- Determin Uncertainty Theory
- Determin Uncertainty Analysis
- General Uncertainty

Aspen Geolog - Electrofacies Analysis (Facimage)

Objective:
This course covers the Facimage functionality in Geolog. It introduces Facimage methodology and provides hands-on experience with electrofacies analysis and data modeling. It focuses on Facimage MRGC (Multi Resolution Graph Based Clustering) and KNN (K-Nearest Neighbor) approach. This method allows a simple, fast, and effective integration of all types of petrophysical and geological information: conventional logs, array and image logs, core measurement, and core description. This training course teaches you how to:

- Identify and select Training Datasets for use with the application dataset.
- Analyze Training Datasets for coherence with the application dataset.
- Perform Facies propagation to create electrofacies.
- Perform log prediction: log reconstruction and core data prediction.
- Perform comparison among cluster models using various methods.

Duration:
2 days

Prerequisites:
Background in geosciences, some prior experience with Geolog is recommended.

Who should attend:
Geolog users, new Facimage users

Contents:

- Define Objective
- Data Preparation
- Basic Workflow
    - Create a Facimage Project
    - Insert a Cluster Model
    - Facies Propagation
- Features
- Training Data
- Comparing MRGC Electrofacies to a Lithology Log
- Similarity Modeling
- Log Prediction
- Electrofacies Ordering -CFSOM
- NMR T2 Electrofacies
- Synthetic Clustering

Aspen Geolog - Full Waveform Sonic Processing

Objective:
This course is designed for users of the Geolog Full Waveform Sonic modules. It teaches the basics of using the array sonic processing tools by guiding the student through a typical workflow and procedures to:

- Become familiar with array sonic waveforms
- View/create an array sonic tool specification
- Create other attributes for a given waveform
- Unpack "packed waveforms" to the individual receiver logs
- Perform data analysis and pre-processing of waveforms
- Remove noise from waveforms using a depth average, time average and frequency filter
- Remove gain and normalization amplitudes added to waveforms during data acquisition
- Process dipole and monopole waveforms
- Perform automatic and interactive picking of arrivals
- Perform dispersion correction
- Traveltime overlay
- View the Semblance display for diagnostic analysis

Duration:
One day

Prerequisites:
This advanced class presumes that participants are experienced with basic Geolog functionality and module processing.

Who should attend:
Geoscientists concerned with processing and interpretation of acoustic waveforms in Geolog.

Contents:

- Well Data Review
- Data Preparation
- Preprocessing
- Slowness Processing
- Postprocessing
- Quick Run
- Dispersion Correction Discussion

Aspen Geolog – Geomechanics and Pore Pressure Prediction

Objective:
Teaches a typical Geomechanics workflow in Geolog.

The Geomechanics module in Geolog allows the estimation of rock properties and stresses acting on a wellbore to determine safe mud weight windows and the most stable drilling direction.

The Pore Pressure Prediction module in Geolog is needed to calculate the effective stress acting on each grain of a rock. The pore pressure defines the lower limit of the mud weight to safely drill a well without formation fluids entering the borehole. The module output logs are an important input to the Geomechanics workflow.

Duration:
Half-day

Prerequisites
The course assumes that the student has a general working knowledge of the Geolog software and is thoroughly grounded in Geomechanics theory.

Who should attend:
Students who are new to the engineering tools in Geolog and would like to learn how to perform a Geomechanical analysis.

Contents

- Well Data and Project Contents
- Geomechanics Overview
- Pore Pressure Processing
- Geomechanics Workflow
    - Open the Geomechanics Layot
    - Isotropic Elastic Rock Properties
    - Rock Strength
    - Stress Magnitude (SHmax and Shmin Poroelastic)
    - SHmax from Polygon Workflow
    - Stereonet Stability Plots
    - Stereonet Stability Plot Examples
    - Learn more

Aspen Geolog - Integrated Interpretation

Objective:
This course teaches you the basics of using Section by guiding you, step by step, through the procedures to:

- Create and display graphical plan and section views of the well path
- Calculate TVD, TVT, TST and Vertical Section (VS) if required data is available
- Graphically define a section using Geolog's Project Map application
- Edit existing sections
- Format the section
- Add interpreted geological surfaces to your section
- Add interpreted geological features to your section such as faults
- Import 3D surfaces and view them against well paths
- Use Correlation in conjunction with Section to aid interpretation
- Display fluid contacts
- Create simple schemes to display in correlations

Duration:
1 day

Prerequisites:
A working knowledge of Geolog and proficiency in using Geolog's Well and Project applications.

Who should attend:
Geologists, geophysicists and petrophysicists

Contents:

- Preparing Data
- Working with Sections
    - Line of Section Views
    - Generating Sections
    - Displaying and Interpreting Between Wells
    - Dynamic Pick Updates Between Correlation and Section
    - Fluid Contents
- Correlation Schemes
- Using 3D Surfaces in a Section
- Putting It All Together

Aspen Geolog - Introductory Loglan Programming

Objective:
Learn how to develop log processing modules to perform your own processing algorithms on your Geolog data. These modules will be fully integrated into the Geolog environment and will function in exactly the same way as any other module in Geolog. A number of exercises are included throughout to demonstrate concepts and to allow you to check your progress.

Duration:
2 days

Prerequisites:
Basic familiarity with the Geolog environment

Who should attend:
Geolog users and programmers

Contents:

- How to write a program
- Create a new program
- The Loglan environment
- Loglan program development interface
- The Module Launcher interface
- Loglan language syntax
- Arrays in Loglan
- Log constants
- External functions
- Module processing
- Creating a combined module
- Introduction to Python
- Additional optional exercises
- Introduction to Macro Reader

Aspen Geolog - Laminated Shaly Sand Analysis (LSSA)

Objective:
This training course will assist you in understanding how Geolog can be used as a tool for performing laminated shaly sand analysis using the LSSA application within Geolog.

The course provides detailed information about the tools available within Geolog for performing formation evaluation using horizontal and vertical resistivity data. This module was originally created to work with Baker Atlas's 3DEX induction logging tool data but can be used with any data that contains horizontal and vertical resistivity measurements, along with porosity and shale volume indicators.

This course:

- Explains the theory behind LSSA
- Explains the difficulties encountered when using conventional techniques for interpreting thin beds
- Compares different methods of obtaining Rv and Rh
- Introduces tensor petrophysics

Duration:
2 days

Prerequisites:
A working knowledge of the Geolog software and of basic Petrophysics.

Who should attend:
Geologists and petrophysicists

Contents:

- Shaly Sand Analysis
    - Conventional Analysis Techniques Using Horizontal Resistivity
    - Why is Conventional Petrophysical Analysis Unreliable in Laminated Formations?
    - How are Horizontal and Vertical Resistivities Measured?
    - An Example to Demonstrate Rv and Rh in Action
- Obtaining Rv and Rh
- Thomas-Stieber and Tensor Petrophysics
- Data Requirements
- The LSSA Workspace File
- LSSA Module in Geolog

Aspen Geolog - Multi-Mineral Analysis and Interpretation (Multimin)

Objective:
Using a hands-on, practical approach, this course is designed to help students learn how to perform sophisticated formation evaluation using Multimin, the advanced petrophysics application in Geolog.

The course is taught by professional trainers to small groups of interested people. The student is guided through the following examples:

- A documented example of a simple analysis, and then further interpretation of the example
- Complex example
- Silt example
- NIMBLE example
- Carbonate example

Duration:
2 days

Prerequisites:
To gain the most from this training course, the following prerequisites are required:

- A working knowledge of Geolog and its conventions, methods for importing data into the software, and the way data is stored.
- A working knowledge of the methods used in Geolog to perform basic preparation tasks for petrophysical data, including:
    - Depth-matching, editing and despiking for petrophysical logs
    - Environmental corrections
    - Data displays
    - Crossplotting
- A general understanding of petrophysics, including the concept of response equations for tools, and the methods used to calculate shale volumes, porosities and water saturations. An appreciation of cation-exchange based methods for water saturation determination is helpful, as is an understanding of mineralogy effects on tool responses.

Who should attend:
Petroleum geologists, engineers and petrophysicists

Contents:

- Introduction to Multimin and Data Preparation
- First Example – Multimin Analysis
- First Example – Alternative Interpretations
- Complex Example
- Multimin Uncertainty
- Silt Example
- NIMBLE Example

- Carbonate Example
- Multimin Aliases
- Verification Example

Aspen Geolog – NMR and NMR2D

Objective:
This course aims to introduce students to the Geolog NMR and NMR2D modules. Both the theory behind NMR and NMR2D measurements and the workflows associated with the modules are covered. The correct interpretation of Nuclear Magnetic Resonance (NMR) logs requires an understanding of the principles that lie behind the measurement, enabling the log analyst to understand the processing, quality control and interpretation of NMR data. This course is structured to achieve the following objectives:

- Give the student an understanding of the principles and theories behind the NMR measurement.
- Use these principles and theories to explain the value and limitations of NMR logging.
- Enable the student to understand the NMR acquisition and processing cycle.
- Provide guidelines on the quality control of NMR data.
- Explain the differences between different tool designs and different modes of acquiring data.
- Relate NMR data to the fundamental properties of rocks and fluids.
- Teach how to prepare 2D NMR logging data for use in Geolog.
- Teach how to process data for 2D map results and the processing steps of interpreting said maps.

During the course, the student will gain practical experience in the processing, quality control and interpretation of NMR logs using the Geolog NMR & NMR2D modules.

Duration:
2 days

Prerequisites:
- A background in geology, petrophysics, or well log analysis
- A working knowledge of the operating system you are using for this course

Who should attend:
Users who are new to the Geolog NMR and NMR2D suite of modules within Geolog.

Contents:

- Introduction to NMR
- Loading NMR Data
- CMR 1D Data Set QC & Inversion
- T2 Analysis
- Load the Coniston Well MR-Scanner Data
- MRX 2D Data Set Workflow
- MReX 2D Data Set Workflow
- NMR Theory
- NMR Tools and Logging Services
- NMR and Petrophysics
- Inversion Revisited
- Glossary and References

Aspen Geolog - Rock Physics (Including Pore Pressure Prediction)

Objective:
This training course is an introduction to the Geophysics application in Geolog, where you will learn how to generate a synthetic seismic trace. The various modules and their capabilities are studied in a logical series of steps, which the geoscientist uses to create the synthetic. In the second section of the course, the fluid substitution workflow will be examined.

Duration:
2 days

Prerequisites:
A good working knowledge of Geolog is required and proficiency in Geolog's Well application, having a good understanding of log manipulation and interrogation.

Who should attend:
Geolog users

Contents:

- Geophysics and Fluid Substitution Workflow Overview
- Data Preparation
- Welltie
- Seismic Tie
- Filters
- Synthetic
- Generate an AVO Synthetic
- Model Well
- Pore Pressure
- Fluid Properties
- Gassmann Model
- Bounds
- Additional Exercises
- Extending the Wire Set to Match the Checkshot Set
- Depth to Time Conversion
- Synthetics for a Vertical Well
- TVD Synthetics for a Deviated Well
- Sources of Errors in Well to Seismic Ties
- Empirical Relations
- Effective Medium Models
- Contact Models

Aspen Geolog - Site Administration

Objectives:
This training course is designed for administrators of Aspen Geolog products. It provides a wide-ranging knowledge of Geolog site administration, teaching the student how to install, configure and maintain Geolog. This course can be combined with the System Administration and Database Management course.

Duration:
2 days

Prerequisites:
Knowledge of Linux and/or Windows administration

Who should attend:
Administrators of Geolog

Contents:

- Customer Support Hub
- Geolog Installation
- Licensing
- Geolog Configuration
- Navigating Online help
- Project Structure
- Project Management (Project Control)
- Epos Permissions
- Geolog Database
- Peripherals
- Tcl
- Variable text

Aspen Geolog - Tcl Programming

Objective:
Learn how to create programs that complement the functionality of Geolog. This course teaches how to develop scripts for log processing, database access, information management, and report generation using Tcl instructions and the Geolog extensions to Tcl. These scripts are fully integrated into the Geolog environment and can be run via the command line or from within the Geolog environment.

The training course guides you through:

- An overview of the Tcl language, including some simple examples
- The syntax and structure of the language with relevant exercises
- An introduction to the Tk graphical extension library
- An introduction to the Geolog extensions

A number of exercises are included throughout to demonstrate concepts and to allow you to check your progress.

Duration:
1 Day

Prerequisites:
Basic familiarity with AspenTech SSE software

Who should attend:
Geolog users and programmers who wish to develop modules for log processing, data base access, information management and report generation.

Contents:

- Tcl Overview
- Creating and Running Your First Tcl Program
- General Tcl and Tk
- Putting It All Together
- Geolog Extensions
- Making Your Own Library
- Using Geolog's Interpreters
- Building a Geolog Module
- log_dbms: Geolog Database Command Language
- Workshop: xplot_macro_by_interval
- Quick Reference
- Geolog Terminal

Aspen Geolog for Geologists

Objective:
This course is designed for new users of the software. It teaches general basics of the primary applications, with hands-on exercises that illustrate most of their features and functions. The student is also exposed the Section and Correlator applications, tools designed for cross-section creation and interactive correlation picking.

Duration
3-4 days depending on class size

Who should attend:
Geologists, geoscientists

Contents:

- **Essentials for Performing Log Analysis using Geolog**
  Gain a general grounding in the primary Geolog applications. Learn to start Geolog, open Geolog applications and document views within the applications, use the menus, tool bars and other functions common throughout Geolog, and manage working projects.
- **Connect**
  Load and export data using different file formats and various file transfers such as project to project.
- **Well**
  Gain an understanding of the basics of the Well application by being guided through a typical workflow and procedures in order to become familiar with Geolog's Well interface and the various track types used in a layout. Learn how to create a customized layout, view and modify well data in text (table) format using Well's text view, view and modify well data using a graphical interface, and generate and modify data using a series of utilities (modules) designed for specific tasks. Learn about the Wellpath view, TVD calculation and the importance of this step for dip picking, Xplot view, frequency plot view and multi-well log analysis.
- **Project**
  Acquire the skills necessary to prepare the data for processing in the current working session, become familiar with mapsheets (basemaps), format mapsheet displays, use mapping tools to display data in various formats, view and search all, or a subset of, the data in a project using the Well Catalog view.
- **Artist**
  Learn how to open new and edit existing pictures, display and position graphic objects, use variable and static text to create a header for use in Geolog layouts and create new fill and marker patterns.
- **Section**
  Gain an understanding of the procedures for displaying vertical and deviated wells, interactive correlation picking and applying geological drawing tools and line styles to cross sections.
- **Correlator**
  Progress through the workflow for performing interactive correlation picking: creating a Project well, loading and modifying an existing Project well, creating and editing stratigraphic interpretation schemes, well partitioning on horizontal wells, and adding interpreted geological surfaces

Aspen Geolog for Petrophysicists

Objective:
Gain a comprehensive overview of the general basics of the primary applications, with hands-on exercises that illustrate most of their features and functions. You are then guided through the deterministic petrophysical workflow and introduced to the Loglan programming language. This course is designed for new users of the software.

Duration:
3- 4 days depending on class size

Prerequisites:
None

Who should attend:
Petrophysicists, geologists, geoscientists

Contents:

Essentials for Performing Log Analysis using Geolog: Gain a general grounding in the primary Geolog applications. Learn to start Geolog, open Geolog applications and document views within the applications, use the menus, tool bars and other functions common throughout Geolog, and manage their working projects.

Connect: Go through loading and exporting data using different file formats and various file transfers such as project to project.

Well: Learn the basics of using the well application by being guided through a typical workflow and procedures so that you become familiar with Geolog's Well interface and the various track types used in a layout. Learn how to create your own layout, view and modify well data in text (table) format using Well's text view, view and modify well data using a graphical interface and generate and modify data using a series of utilities (modules) designed for specific tasks.

Project: Learn how to prepare the data for processing in the current working session, become familiar with mapsheets (basemaps), format mapsheet displays, use mapping tools to display data in various formats, view and search all, or a subset of, the data in your project using the Well Catalogue view.

Determin: Learn how Geolog can be used as a tool for performing deterministic petrophysical well evaluations. All common techniques for shale/clay volumes, porosity, saturation and lithology determination are included. Interactive picking using crossplot and frequency plot and multi-zone/multi-well analysis provide a rapid workflow for the formation evaluation.

Loglan: Gain basic skills necessary for creating and running a Loglan module. Loglan is a fully functional programming language which is written, compiled and executed within Geolog. It allows you to develop your own modules to perform log processing and many other applications.

GEOLOGIC MODELING

Aspen RMS - Introduction

Objective:
This course provides the student with a comprehensive introduction to RMS. Students will progress through a series of exercises, import and analyze data, build a structural model, flow simulation grid and geological modeling grid, model facies and petrophysical data, compute volumetrics and assess the impact of uncertainty on the volumes.

Duration:
3 days

Prerequisites:
None

Who should attend:
This course is designed for reservoir engineers and geoscientists.

Contents:

- RMS User Interface
- Starting a New Project
- Import, Visualize and Edit Data
- Printing and Presentation
- Model Driven Interpretation
- Structural Modeling
- Grid Building
- Blocking (Upscaling) of Wells
- Blocked Well Quality Control
- Facies Modeling in RMS
- Petrophysical Modeling in RMS
- Volumetrics
- Workflow Management
- Uncertainty Management
- Upscaling for Simulation
- The Roxar API and RMS Plugins

Aspen RMS - Dynamic Well Modeling

Objective:
Learn how RMS can be used to define dynamic well data as input to a flow simulation. This course covers the RMS Event model, import of completion and production data, preparation of flow model data, and export of keywords to the flow simulator.

Duration:
Two days

Prerequisites:
The RMS Introduction course

Who should attend:
This course is designed for reservoir engineers and geoscientists.

Contents:

- Working with Event Sets
- Import/Export of Events Data
- Flow Model Events
- Production Data
- Simulator Data
- Well and Group Control
- Event Utilities
- Multi-segment Well Modeling
- Multilateral Wells

Aspen RMS - Model Driven Interpretation

Objective:
Learn the basic tools of interpretation in RMS and how to use them to solve subsurface modeling challenges.

Duration:
Two days

Prerequisites:
The RMS Introduction course

Who should attend:
This course is designed for reservoir engineers and geoscientists.

Contents:

- Model Driven Interpretation
- Seismic Data Import
- Seismic Visualization
- Well Ties
- Model Driven Interpretation
- Time-To-Depth Conversion
- Modeling While Interpreting

Aspen RMS - Structural Modeling

Objective:
This course explains how to create a structural model in RMS, and includes both fault and horizon modeling. After taking this course, the student should be able to create a structural model, QC it, and use it to create a 3D grid.

Duration:
1 day

Prerequisites:
RMS intro course or hands-on experience

Who should attend:
This course is designed for reservoir engineers and geoscientists.

Contents:

- Fault modeling
    - Fault truncations
        - Fault QC
- Horizon modeling
    - Horizon QC
    - Extracting data from the horizon model
- Building a grid based on the structural model

Aspen RMS - Structural Uncertainty

Objective:
This course teaches the different structural uncertainty tools available in RMS. Learn how to create a predicted model using the Horizon Uncertainty Modeling tool, adding Fault Uncertainty, building a structural model and then a grid model.

The solution is designed to help decision makers acknowledge the uncertainties associated with structural framework modeling, and quantify them.

Structural Uncertainty Modeling tools comprise a Fault Uncertainty Modeling solution and a Horizon Uncertainty Modeling solution.

Duration:
2 days

Prerequisites:
The RMS Introduction course

Who should attend:
This course is designed for reservoir engineers and geoscientists.

Contents:

- Introduction
- Introduction to Horizon Uncertainty Modeling
- Project Exercise Data – Visualizing and Preparing
    - Creating a Predicted Model
- The Structural Uncertainty Workflow
- Fault Uncertainty
- Volumes
- Other Applications

Aspen RMS - Grid Design and Upscaling

Objective:
Gain insight into the building of a grid, and upscaling of grids and parameters to prepare for export to simulation software. The course is divided into two parts: Grid Design and Upscaling.

Duration:
1-2 days

Prerequisites:
The RMS Introduction course

Who should attend:
This course is designed for reservoir engineers and geoscientists.

Contents:

Grid Design

- Grid Design
- Grid Quality Control
- Grid Editing
- Segments and LGRS

Upscaling

- Upscaling Grid Properties
- Creating Flow Model Events
- Exporting Grid Model Data
- Importing Simulation Results

Aspen RMS - Advanced Gridding

Objective:
This course introduces advanced grid construction in RMS. It covers grid analysis and quality control, options for grid construction, and alternative grid construction workflows.

Duration:
One day

Prerequisites:
The RMS Introduction course

Who should attend:
This course is designed for reservoir engineers and geoscientists.

Contents:

- Grid Analysis
- Advanced Grid Design
    - Fault Representation and QC
    - Zone Layout and QC
- Grid Post Processing
    - Erode Grid
    - Global Grid Refinement in the Horizontal Direction
    - Global Grid Refinement in the Vertical Direction
    - Local Grid Update

Aspen RMS – Advanced Property Modeling

Objective:
This two-part course teaches about facies and petrophysical modeling in RMS. Learn how to use the tools to produce the desired results. The parts can be taken separately or together.

Duration:
3 days for both parts of the course

Prerequisites:
The RMS Introduction course

Who should attend:
This course is designed for reservoir engineers and geoscientists.

Contents:

Advanced Facies Modeling

- Facies Modeling Techniques in RMS
- Modeling Fluvial Environments
- Modeling Shoreface and Delta Environments
- Modeling Turbidites
- SedSeis

Advanced Petrophysical Modeling

- Case 1: Modeling Porosity and Permeability in Shoreface and Fluvial Reservoirs
- Case 2: Turbidite Reservoir, Porosity Intrabody Trends

Aspen RMS - Well Planning and Well Monitoring

Objectives
This course describes the well planning and well monitoring process, enabling the student to set up a workflow for well planning and real-time geosteering for both traditional and more complicated wells. The student will also be able to update the structural model locally with information from real-time geosteering.

Duration:
2-3 days

Prerequisites:
The RMS Introduction course or hands-on experience

Who should attend:
Reservoir engineers and geoscientists

Contents:

- Importing well data
- Log display and correlation
- Target design
- Trajectory design
- Sidetracks
- Lateral target groups
- Sequential target groups
- Well position uncertainty
- Anti-collision
- Well monitoring
- Deviated well session
- Workflow-based interpretation

Well Correlation in Aspen RMS

Objective:
This course describes how to use the Well Correlation tool in RMS, how to create log templates, handle different log types and correlate well picks. At the end of the course the student should have a deeper understanding of this tool.

Duration:
1 day

Prerequisites:
The RMS Introduction course or hands-on experience

Who should attend:
This course is designed for reservoir engineers and geoscientists.

Contents:

- Investigate the correlation view
- Log templates
    - Creating new templates
- Log objects
    - Discrete
    - Continuous
- Correlation and 3D view
- Correlating Well Picks

Aspen SKUA Fundamentals

Objective:
Learn how to get started with SKUA modeling technology. The course progresses through a series of exercises designed to familiarize the student with the SKUA interface and processes for loading, reviewing, and preparing data.

Duration:
1 - 1.5 days.

Prerequisites:
Background in geosciences

Who should attend:
Geoscientists, engineers, or other technical personnel interested in using 3D modeling technology to model reservoirs.

Contents:

- About SKUA
- Touring an Existing SKUA Project
    - Opening an Existing SKUA Project
    - Navigating the Interface
    - Organizing and Manipulating Objects in the 3D Viewer
- Getting Started with a New SKUA Project
    - Creating a New SKUA Project
    - Customizing the Interface
    - Accessing the Online Help and Support
- Importing and Visualizing Data
    - Importing Data
    - Organizing Data by Geologic Features
- Reviewing Well Data
    - Organizing Wells in Lists
    - Analyzing Well Log Data
    - Reviewing Well Data in a Well Section
    - Computing and Mapping Well Zone Values
- Reviewing Interpretation Data
    - QC Cultural Data
    - Reviewing Horizon and Fault Interpretations

Modeling Reservoir Architecture using Aspen SKUA

Objective:
This course teaches students how to use SKUA's unique technology to create geologically accurate structural models, geologic grids and flow simulation grids, regardless of the structural complexity of the reservoir.

This course covers the following topics:

- Introduction to SKUA technology
- Defining the geologic information for reservoir modeling
- Building a 3D structural model
- Building a geologic grid architecture
- Building a flow simulation grid architecture

Duration:
3 days

Prerequisites:
- Background in geosciences
- Working knowledge of the operating system you are using for the course.
- Completion of the Fundamentals of SKUA training course or completion of the following eLearning courses available on Online University > All Courses > SKUA-GOCAD - Subsurface Modeling > Getting Started:
    - Creating a Project and Importing Data in SKUA-GOCAD
    - Navigating the User Interface and Managing Your Data in SKUA-GOCAD

Who should attend:
Geophysicists, geologists, petrophysicists and reservoir engineers interested in using SKUA technology to model reservoirs.

Contents:

- SKUA Quick Start
    - Modeling Reservoirs Using SKUA Workflows
    - Building a Structural Model
    - Building a Geologic Grid and Property Modeling
    - Building a Flow Simulation Grid
    - Upscaling Properties to the Flow Simulation Grid
- Data Preparation
    - Global Data Preparation Process and Definitions
    - Defining Geologic Features
    - Building a Stratigraphy Column
    - Defining Stratigraphy along Wells
- Structure and Stratigraphy Modeling
    - SKUA Volumetric Approach

    - Preparing the Data and Defining the Volume of Interest
    - Modeling the Fault Network and Fault Blocks
    - Modeling Horizons
    - Modeling the Geologic Grid
- Flow Simulation Grid Modeling
    - About Flow Simulation Grids in SKUA
    - Building a Flow Simulation Grid and Editing the Cell Alignment
    - Creating a Non-Uniform Gridding Using Tartan
- Updating a SKUA Model
- Case Studies
    - Garfield: Modeling an Unconformity
        - Preparing the Data
        - Modeling the Faults and Horizons
        - Using the Well Stratigraphy
        - Building the Geologic Grid and Flow Simulation Grid
    - Bonnie: Modeling an Extensive Environment
        - Geological Context
        - Dataset
        - Summary

Velocity Modeling and Calibration Using Aspen SKUA

Objective:
In this flexible one to two-day course the student learns how to make the most of the unique SKUA technology to build geologically constrained velocity models and perform efficient time-to-depth conversion. Unlike other solutions where structural complexity is a limiting factor, SKUA structural and stratigraphic modeling enables accurate time-to depth conversion in salt and structurally complex environments, and provides all the tools needed to create geologically realistic velocity models.

Duration:
1 to 2 days

Prerequisites:

- Background in geosciences
- Some experience with SKUA, or attend the Modeling Reservoir Architecture Using SKUA class

Who should attend:
Geoscientists, engineers, or other technical personnel interested in using 3D modeling technology to model reservoirs.

Contents:

- **Importing Data**
  - Creating a Project and Importing Data
  - Reviewing Data
- **Building a SKUA Model and Geologic Grid**
  - About SKUA Technology & Structure and Stratigraphy (SnS) workflow
  - Creating a SKUA 3D Structural Model
  - Creating a Geologic Grid
- **Building a Velocity Model from Seismic Velocity**
  - Converting RMS Velocity Functions to Interval Velocity
  - Interpolating the Interval Velocity in the Geologic Grid
  - Building an Average Velocity Cube from the Interval Velocity Model
- **Calibrating Seismic Velocity to Well Data**
  - Regional Calibration to the Checkshots
  - Local Calibration to the Well Markers
- **Time-to-Depth Conversion**
  - Converting the Interpretation and SKUA Model to Depth
  - Converting the Seismic Cube to Depth
- **Building a Velocity Model for Time-to-Depth Conversion from Well Velocity**
  - Introduction to the Dataset
  - Quick Time-to-Depth Conversion Using Pseudo-Velocity
  - Building a 3D Sonic Velocity Model for Time-to-Depth Conversion using Detrending

Aspen SKUA - Data Analysis and Property Modeling

Objective:
A rigorous and systematic analysis of reservoir data is key to the construction of a reliable reservoir model. In this two-day course the student progresses through a series of comprehensive exercises to gain a practical approach to reservoir data analysis and stochastic property modeling. The course teaches how to use the Data Trend Analysis workflow and the Reservoir Properties workflow to create robust and realistic 3D models of the lithology, porosity and permeability. This is followed by reservoir volumes computation and post-processing.

Duration:
2 days

Prerequisites:

- A background in geosciences is required.
- Attending the Modeling Reservoir Architecture Using SKUA class.
- Optional: Complete the courses available in Online University under SKUA-GOCAD > Reservoir Characterization

Who should attend:
Geoscientists and engineers

Contents:

- Introduction to Data Analysis and Property Modeling
- Raw Data Analysis
- Discrete Property Modeling (Facies)
- Continuous Property Modeling (Porosity and Permeability)
- Reservoir Volume Computations and Post-Processing

Aspen StratEarth - Introduction to Well Correlation

Objective:
This course introduces StratEarth as part of an integrated solution for well correlation. In this course, students progress through a typical geological workflow: After a quick overview of Epos applications and utilities, they learn how to prepare and activate well data prior to well correlation. They are then introduced to two different approaches to well correlation in StratEarth: Simple correlation, when stratigraphic units are conformable, and correlation in complex settings using a stratigraphic column. Lastly, students use BaseMap and 3D Canvas capabilities for visualization, mapping and volumetric computation to QC and review their results.

Duration:
3 days

Prerequisites:

- A background in geology or geophysics is required.
- Complete the following courses available in AspenTech University:
  StratEarth > Working with Well Track Templates in Vertical Sections in StratEarth
  StratEarth > Well Correlation in StratEarth
  StratEarth > Using Cross Sections for Geologic Interpretation in StratEarth

Who should attend:
This course is designed for geologists, geoscientists, engineers, and other technical staff who are interested in performing well correlation in Epos.

Contents:

- Overview
- Reviewing and Activating Well Data
- Well Correlation in StratEarth
- Creating Maps in BaseMap and 3D Canvas
- Volumetrics and Deliverables

INTERPRETATION

Aspen GeoDepth/SeisEarth Velocity Modeling - Time to Depth Conversion

Objective:
The objective of this course is to expose students to as many tools as possible for performing time-to-depth conversion while giving examples of meaningful workflows. We hope that students will then be able to develop company specific workflows using what they have learned in the course.

The student is introduced to the Aspen GeoDepth/SeisEarth Velocity Modeling toolkit and learns how to perform 2D and 3D visualization, model building from structure-limited and non-structural velocity sources, integration of well and seismic data, calibration to wells, basic geostatistical mapping, Constrained Velocity Inversion, building a velocity volume, estimating velocity gradients, and editing data.

Duration:
3 days

Prerequisites:
Geoscience background

Who should attend:
Geologists, geophysicists

Contents:

- Getting Started
  - Getting Started
  - Data Preparation
- Structure Independent Velocity Modeling and Depth Conversion
  - Velocity Volume Creation with Constrained Velocity Inversion (CVI)
  - Velocity Volume Creation with the Global Velocity Model Builder
  - Slice-Based Velocity Volume Creation
  - Depth Conversion using a Velocity Volume
  - Updating the Velocity Model with Tomography
- Horizon-Based Velocity Modeling and Depth Conversion
  - Preparing for Horizon-Based Modeling
  - Horizon-Based Velocity Modeling
  - Depth Conversion
- Additional Workflows
  - Velocity Modeling using Well Markers
  - Working with Velocity Gradients
  - Using Geostatistics and Building Hybrid Models

Aspen SeisEarth - Multi-Survey (2D/3D) Interpretation

Objective:
The course follows a typical interpretation workflow. Learn to:

- QC the SeisEarth dataset using the database managers and examine the data in Integrated Canvas**.**
- Calibrate the wells to the corrected seismic data.
- Perform structural interpretation of target features, including faults and horizons.
- View your interpreted data, using the visualization tools in 3D Canvas, to examine and interpret target stratigraphic features.
- Create fault outlines and map boundaries, and then a multi-survey map, with contours, fault heave symbols and more. You will also extract attributes along horizons and make plots of the maps.

Duration:
4 days

Who should attend:
New SeisEarth users, Interpreters

Contents:

- Data QC
  - SeisEarth Dataset Review
  - Integrated Canvas Overview
  - Page Layout and Toolbar Customization
  - Seismic Data Visualization
  - Well Data Visualization
- Data Correction
  - Well to Seismic Calibration
- Structural Interpretation
  - Fault Interpretation
  - Horizon Interpretation
- Stratigraphic Interpretation
  - Volume Visualization
  - Volume Flattening
  - Volume Interpretation
- Mapping
  - Gridding and Contouring
  - Extracting Attributes along Horizons
  - Plotting
- Additional Exercises
  - Culture Data Visualization
  - Seismic Mis-tie analysis and Correction
  - Working with Unassigned Faults
  - 2D Propagator
  - Fault-Horizon Contacts
  - Calculating Volumetrics

Aspen Quantitative Seismic Interpretation - Fluid Property Estimation Using AVO Analysis

Objective:
This course teaches you how to:

- Display well data using the Well Log window
- Generate AVO log attributes using Synthetic Modeling
- Analyze AVO attributes for fluid anomalies using crossplotting tools
- Generate AVO attribute seismic volumes and angle stacks using AVO inversion
- Analyze AVO attribute volumes using volume crossplotting
- Analyze prestack data for AVO indicators, using AVO tools in 3D Canvas and 2D Canvas applications

Note:
This course is taught and guided by an instructor and uses short videos and hands-on exercises for self-paced learning. Videos are available during and after the course through Online University.

Duration:
1-1/2 days

Prerequisites:
A basic understanding of prestack seismic data. Familiarity with 3D Canvas, Well Log Window and Section window and a basic understanding of the Epos database.

Who should attend:
Geoscientists interested in analyzing AVO effects on prestack seismic and log data to identify hydrocarbon prospects.

Contents:

- Introduction to Rock Properties and Elastic Moduli
- AVO Analysis Using Well and Seismic Data
    - Amplitude Versus Offset (AVO)
    - Analyzing AVO Effects in Well Data
    - Analyzing AVO Effects in Seismic Data

Aspen Quantitative Seismic Interpretation - Rock and Fluid Property Estimation Using AVO and Inversion Workflows

Objective:
This course guides students through a reservoir characterization workflow which integrates petrophysical analysis, rock physics, AVO analysis, seismic inversion, and powerful 3D visualization techniques, to identify, visualize and validate hydrocarbon prospects. Students will integrate data from well logs and post- and prestack seismic data using aspenTech tools. A thorough introduction to elastic wave theory, rock physics, AVO theory, and seismic inversion is presented. In addition, the course includes exercises that integrate 2D modeling (wedge modeling) into the AVO analysis workflow.

Duration:
4 days

Prerequisites:
A basic understanding of prestack seismic data. Familiarity with 3D Canvas, Well Log window and Section window, and a basic understanding of the Epos database.

Who should attend:
Geoscientists interested in using log analysis, AVO attributes and seismic inversion to combine information from well data, and poststack and prestack seismic data for prospect identification

Contents:

- Reservoir Characterization Overview
- Analyzing Well Data for Fluid Anomalies
    - The Effect of Fluid Content and Lithology on Elastic Wave Propagation
    - Analyzing Well Data for Fluid Anomalies (exercises)
- Analyzing AVO Effects in Well and Seismic Data
    - AVO Theory
    - Analyzing AVO Effects in Well Data
    - Analyzing AVO Effects in Seismic Data
- Analyzing Petrophysical Attributes of the Seismic (Seismic Inversion)
    - The Background Model
    - Calibrating the Wells and Obtaining Wavelets and Scale Factors
    - Preparing the Logs for Inversion: Editing and Fluid Substitution
    - Creating a Background Model
    - Generating Rock Property Volumes Using Prestack Maximum Likelihood Inversion (PMLI)
    - Inversion QC
- Target Identification and Visualization
    - Displaying the Hydrocarbon Anomalies in 3D Canvas Using Crossplotting and Volume Rendering
    - Integrating the Results of Rock Property and AVO Analyses to Identify Targets
    - Validating Potential Targets Using the Corrected Gather

Aspen Quantitative Seismic Interpretation - Seismic Facies Classification

Objective:
In this course, students learn techniques to incorporate prestack and poststack seismic data and well data to create seismic facies probability models. Students are taught how to work with wireline and facies logs in the crossplot utility to analyze litho-seismic relationships and apply those relationships to inverted attributes to create probabilistic lithology models. In addition, use of the workflow engine to apply different machine learning techniques to generate facies models is taught. Students gain a solid understanding of the different parameter settings in the workflows, and the QC options available to analyze and optimize the results.

Duration:
1 day

Prerequisites:
Familiarity with Integrated Canvas.

Who should attend:
Geoscientists and geophysicists interested in facies visualization and probability analysis for interpretation and reservoir characterization workflows.

Contents:

Crossplot Indexing and Lithoseismic Classification in Integrated Canvas: This one-to-two-hour course includes two exercises that provide a hands-on introduction to manual and statistical crossplotting tools available in AspenTech software.

- The first exercise covers how to work with multiplots to create indexed volumes, logs and maps.
- The second exercise covers how to use the Litho-seismic Classification utility to create lithologic probabilities based on a crossplot of log attributes and user-defined parameters. The probabilities are saved as a crossplot relationship, which can then be applied to volume attributes using the Seismic Attributes calculator to generate Most Probable Facies volumes.

The course also includes tips for visualizing the results in Integrated Canvas.

Waveform Classification in Integrated Canvas: The Waveform Classification workflow in Integrated Canvas uses a neural network approach to create facies volumes from poststack seismic attributes. This two-hour course focuses on the theory behind the workflow and how to define and QC the workflow parameters to ensure the best results. In addition to learning how to run the workflow, students learn different visualization tools for examining the results. Students learn how to use the Waveform Classification workflow to perform:

- Unsupervised classification
- Supervised classification using:

- Seismic traces or well logs
- 2D Models (wedge models)

Rock Type Classification in Integrated Canvas: The Rock Type Classification workflow uses a machine learning approach to create a probabilistic facies model based on lithology logs and prestack and/or poststack seismic attributes. This one-hour course focuses on the theory behind the workflow and understanding how to define and QC the workflow parameters to ensure the best results. In addition to learning how to run the workflow, students learn different visualization tools for examining the results.

Attribute Clustering in Integrated Canvas: The Attribute Clustering workflow uses a machine learning approach (Self Growing Neural Network) to create a facies model based on poststack and/or prestack seismic attributes. This one-hour course focuses on the theory behind the machine learning method and on understanding how to define and QC the workflow parameters to ensure the best results. In addition to learning how to run the workflow, students learn different visualization tools for examining the results.

Aspen Quantitative Seismic Interpretation - Using Seismic Inversion for Rock and Fluid Property Characterization

Objective:

The course teaches you how to:

- Display well data using the Well Log window
- Analyze well data for fluid anomalies using crossplotting tools
- Generate AVO attribute volumes and angle stacks using the AVO inversion operation in the Seismic Operations utility.
- Analyze prestack data for AVO indicators, using AVO tools in 3D Canvas and 2D Canvas applications
- Create synthetic models using the Synthetic-Seismics utility to calibrate well data to seismic data, analyze fluid affects using fluid substitution modeling, and generate global wavelets for inversion.
- Create background impedance models from log and interpretation data, using the Geostatistical Volume Creation utility. The background models will be used in the inversion process.
- Generate rock property volumes (impedance, Poisson's ratio, Vp/Vs) using simultaneous inversion (PMLI) on angle stacks or gathers.
- Examine inversion results using visualization tools in 3D Canvas.
- Validate the inversion results by extracting logs from the rock property volumes and comparing the extracted logs against the original logs.

Note:
This course is taught and guided by an instructor and uses short videos and hands-on exercises for self-paced learning. Videos are available during and after the course through Online University

Duration:
1.5 days

Prerequisites:
A basic understanding of prestack seismic data. Familiarity with 3D Canvas, Well Log Window and Section window and a basic understanding of the Epos database.

Who should attend:
Geoscientists interested in using seismic inversion to generate and analyze rock property volumes for hydrocarbon prospects.

Contents:

- Introduction to Rock Properties and Elastic Moduli
  - The Elastic Moduli
  - Fluid vs. Lithology: The Importance of Vp/Vs
  - Impedance Attributes
- Analyzing the Well Data for Fluid Anomalies
- Seismic Inversion for Fluid and Rock Property Analysis

RESERVOIR ENGINEERING

Aspen Tempest - Advanced Reservoir Simulation

Objective:
This course provides training in the Tempest ENABLE software. The aim of the course is to provide insight into how the software works, and how to set up and do simulations, run history matching, and analyze the results.

Duration:
2-3 days

Prerequisites:
No pre-requisite necessary

Who should attend:
Reservoir engineers

Contents:

- Appraisal workflow
- History match proxy-based workflow
- Diagnostics
- Prediction
- Optimization
- History match ensemble smoother-based workflow

SEISMIC PROCESSING AND IMAGING

Aspen Echos - 3D Marine Processing

Objective:
Learn about the interactive and processing approaches in Echos for 3D marine datasets.

Duration:
3 days

Who should attend:
Experienced seismic data processors, new Echos users

Contents:

- Getting Started
  - Import Data/Geometry
  - QC Loaded Data
  - Receiver Motion Compensation
  - Channel Amplitude Correction
  - QC Noise Analysis
  - Editing
- Wavelet Processing
  - De-signature
  - De-bubble
  - Resampling
- Noise Attenuation
  - Swell Noise Attenuation
  - Random Noise Attenuation
  - Linear Noise Attenuation
- De-ghosting and Spherical Divergence
  - De-ghosting
  - Spherical Divergence
  - CDP Sorting
  - Velocity Analysis
  - Stack
- Multiple Attenuation
  - T-p deconvolution
  - SRMA
  - WEMA
  - Regularization and Migration
  - Regularization
  - Migration
- Poststack Processing
  - Residual Velocity Analysis

    - Post-migration De-multiple
    - Other Poststack Processing
- Parallelization

Aspen Echos - Land Processing

Objective:
Learn about the interactive and processing approaches in Echos for 2D and 3D land datasets.

Duration:
3 days

Who should attend:
Experienced seismic data processors, new Echos users.

Contents:

- 2D Land Processing
    - Creating Survey
    - Importing Dataset
    - Creating Geometry Model
    - Add Geometry to Traces
    - Noise Attenuation
    - First Break Picking
    - Static Correction
    - CDP Mean Statics
    - Velocity Analysis
    - Stack
    - Residual Statics
    - Floating Datum
    - Velocity Transformation
    - Migrations
- 3D Land Processing
    - Creating Survey
    - Importing Dataset
    - Creating Geometry Model
    - Add Geometry to Traces
    - Validating Geometry
    - Visualization
    - Surface Consistent Deconvolution
    - Surface Consistent Amplitude Scaling
    - First Break Picking
    - Static Correction
    - CDP Mean Statics
    - Velocity Analysis
    - Regularization
    - Stack

Aspen Echos - Seismic Data Processing

Objective:
Learn about the interactive and processing approaches to using Echos, and the wide range of modules available. Echos is a workstation-based processing system that combines interactive and batch, prestack and poststack processing.

Duration:
4-5 days

Who should attend:
Experienced seismic data processors, new Echos users

Contents:

- Getting Started Using Echos
  - Epos Data Management
  - Getting Started Using Echos
  - Building a Job Flow in Echos
- Working with Land Data
  - Getting Started with Land Data
  - Amplitude Corrections and Signal Processing
  - Signal Enhancement and Noise Attenuation
  - Picking First Breaks and Static Solution
  - Floating Datum Processing
  - Velocity Analysis
  - Residual Statics
  - Data Regularization, DMO and Poststack Processing
  - Imaging
- Working with Marine Data
  - Getting Started with Marine Data
  - Initial QC Tasks
  - Wavelet Processing
  - Noise Attenuation
  - Deghosting and Multiple Attenuation
  - Q Estimation and Correction
  - Tidal Statics and Channel Amplitudes
  - Spherical Divergence Correction
  - Imaging

Aspen GeoDepth - 2D Depth Velocity Model Building and Depth Imaging

Objective:
This two-day training course teaches students how to create an initial interval velocity model, perform depth imaging, and update the velocity model using GeoDepth 2D. Students first build an initial grid-based velocity section, run 2D Kirchhoff Prestack Depth Migration, then update the velocity model with 2D Grid Tomography. Students are taught how to create a horizon-based interval velocity section using Coherency Inversion Analysis and normal incidence ray migration, and to update the depth/velocity model with Model Based Tomography. Students also learn how to run 2D Grid Tomography in multi-2D line mode. Finally, students perform residual moveout analysis in vertical mode and use Constrained Velocity Inversion to update interval velocity sections.

Duration:
2 days

Prerequisites:
Some familiarity with AspenTech SSE software

Who should attend:
New GeoDepth users, geophysicists

Contents:

- Introduction
  - Getting Started
  - QCing Data
  - Preparing the Data
- Grid Based Velocity Modeling and Updating
  - Creating an Initial Depth/Interval Velocity Section Using CVI
  - Performing Prestack Depth Migration
  - Updating the Depth/Interval Velocity Model with Grid Tomography
- Additional Workflows
  - 2D Multi-Line Workflow
  - Layer Based Velocity Modeling
  - Updating Velocity Models with CVI

Aspen GeoDepth - 3D Depth Velocity Model Building and Depth Imaging

Objective:
This training course is designed to introduce new and existing users to the working environment and applications in GeoDepth. The course guides the student through our recommended basic time-to-depth velocity analysis workflows and time-to-depth migrations in GeoDepth 3D. It offers students two alternatives for building the initial model: a structure-independent (grid-based) and a layer-based model building workflow. Example workflows are provided.

The training manual offers a detailed step-by-step description of each workflow, including operational information about each application, as well as theoretical considerations and practical hints regarding each step. The training manual maintains a realistic production-oriented approach, and emphasizes correct practices (e.g. correct setup, QC of results after each stage, etc.).

Duration:
3, 4 or 5 days, depending on the topics covered.

Prerequisites:
Some familiarity with AspenTech SSE software

Who should attend:
New GeoDepth users, geophysicists

Contents:

- Introduction, Setup, Data Loading and QC
  - Launching Paradigm 22
  - Session Manager Overview
  - 3D Survey Setup and QC, Seismic and Velocity Data Loading
  - Seismic Data QC
  - Interpretation Data Loading and QC
  - QC and Preparation of Velocity Data
- Initial Velocity Model Building and Prestack Depth Migration
  - Initial Depth Interval Velocity Volume Creation with Constrained Velocity Inversion
  - Target Line 3D Kirchhoff Prestack Depth Migration
- Updating the Velocity Model with 3D Grid Tomography
  - Depth Interpretation
  - Structural Attribute Volume Creation
  - Pencil Creation
  - Interactive Ray Tracing and RMO Autopicking
  - 3D Grid Tomography
- Horizon Based Velocity Modeling and Tomography
  - Prepare for Horizon Based Velocity Model Building
  - Horizon Based Depth Interval Velocity Model Creation
  - Target Line 3D Kirchhoff Prestack Depth Migration

    - Generate Structural Information for Tomography
    - Interactive Ray Tracing and RMO Autopicking
    - 3D Structural Model Based Tomography
- Final Depth Migration and Other Workflows
    - Final Depth Migration Considerations
    - Example Workflows
    - Using FastVel and CVI for Velocity Model Updating
    - Working with Anisotropy