Structural Modeling with LithoTect Software

Discipline: **Structural Geology, Balancing & Restoration, Software Modeling**

Length: **3 days**

Instructor

Catalina Luneburg is the owner and director of TerraEx Group LLC and responsible for developing and promoting the new services model as well as daily operations. She is a recognized Structural Geology expert in the validation of a variety of basins and petroleum systems worldwide, focusing on geologic interpretation and validation, Structural Geology modeling, cross section balancing and 2D/3D time-step restorations as well as HC reserve estimates, 3D framework building and fracture prediction analyses. Previously, Luneburg was a Product Manager and Senior Scientist at Landmark/Halliburton developing geomodelling workflows and managing/designing software applications such as LithoTect and DecisionSpace. She has also held positions with GeoLogic Systems and Midland Valley, and spent many years in academic teaching and research. Luneburg holds a doctorate in Natural Sciences from the Swiss Federal Institute of Technology in Zurich, Switzerland, and a master's degree (Diploma) in Geology/Paleontology from the Ludwig-Maximilian University in Munich, Germany. She has published extensively in her field including several books, and has authored a number of patents. She is fluent in English, German, and Spanish, and proficient in French and Italian.

COURSE DESCRIPTION

This course introduces structural restoration and balancing techniques using LithoTect Software. Examples focus on petroleum exploration workflows in compressional and extensional tectonic regimes. The main LithoTect tools are taught, from creating a project and loading data to applying balancing and restoration techniques such as independent fault block restorations, fault slip, or backstripping.

LEARNING OUTCOMES

After this course participants will be able to:

- Understand the principal concepts of structural balancing
- Decide which kinematic models to choose for structural modeling
- Use different structural restoration methods in compressional and extensional

tectonic examples
- Navigate the LithoTect Software user interface
- Create a LithoTect project and load data
- Use the basic LithoTect modeling tools such as transform, fault slip, forward modeling, backstripping with decompaction and isostatic adjustment
- Use fault prediction techniques and depth-to detachment methods
- Calculate strain as a fracture proxy using LithoTect geometry fields (dip, curvature and strain attributes)
- Use LithoTect 3D modeling tools

COURSE CONTENT

Day 1 Basic LithoTect Tools

1.1. Introduction

1.2. Introduction to main LithoTect functionality

1.3. Structural Geology Concepts

1.4. Create LithoTect projects and load data

1.5 Basic interpretation tools

Day 2 LithoTect Modeling Tools

2.1. Introduction to Structural Validation

2.2. Kinematic models and restoration algorithms

2.3. Kinematic Modeling

2.4. Restoration concepts and methods

2.5. Restoration Methods

2.6. Fault Prediction

2.7. Exercises

Day 3 Workflows and advanced modeling

3.1. Compressional structures and restoration

3.2. Advanced restoration tools

3.3. Exercise Imbricate Thrusts

3.4. Extensional structures and restoration

3.5. Extensional restoration workflows

3.6. Exercise Backstripping

4.1. Fracture proxies and prediction

4.2. Geometry fields and strain

4.3. 3D Modeling