Formation - Basin Modeling: Thermicity, Maturation and Migration

TEMIS-EN-P | Présentiel | 5 jours

This course provides an in-depth and practical understanding of thermal basin modeling in a comprehensive workflow, including modeling of oil maturation and hydrocarbon migration, and leading to the assessment of hydrocarbon potential of an exploration block or a prospect

Niveau

Perfectionnement

Public

Junior petroleum exploration geoscientists, multidisciplinary-team managers

Objectifs

Attendees will be able to implement the following skills:

- Understand source rock maturation and hydrocarbons generation
- Assess most significant basin modeling parameters for regional basin model construction (using the 1D module of TemisFlow™)
- Understand hydrocarbon migration processes (using the 2D module of TemisFlow™) and evaluate the hydrocarbon potential of a given area

Pédagogie & ressources techniques

- Afternoon sessions are devoted to case studies based on non-proprietary data provided by IFP
- Use of the software program TemisFlow™ (maximum 2 participants per workstation)
- By the end of each afternoon, participants generate short reports which are assessed the following day
- Participants have the alternative of using their own data
- Upon request, the course can make use of a company's regional dataset, provided the latter is made available in advance
- Software used during workshops: with courtesy of Beicip-Franlab

Évaluation des acquis

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prérequis

No prerequisites are necessary to follow this course

Responsable

IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

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Programme

SEDIMENTARY BASIN MODELING THROUGHOUT TIME — 1 day

AM: lectures.
Basin types (rift, margin, foreland, etc.).
Subsidence versus time.
Compaction, backstripping.
PM: exercises, introduction to TemisFlow™ 1D module, subsidence curve calculation.

THERMAL HISTORY — 1 day

AM: lectures.
Modes of heat propagation: conduction, convection and advection.
Transient thermal regimes and blanketing effects of sedimentary covers.
Calibration of heat flow for present and past thermal state.
PM: exercises with TemisFlow™ 1D module, influence of heat flow, surface temperature, conductivity.

MATURATION & EXPULSION — 1 day

AM: lectures.
Source rock (kerogen type, Rock-Eval data...).
Kerogen cracking, kinetic parameters determination.
Secondary cracking.
Paleo-thermometers (organic matter, fission tracks, fluid inclusions...).
PM: exercises with TemisFlow™ 1D module, influence of kinetic parameters.

HYDROCARBONS MIGRATION - WORKSHOP — 2 days

Session 1:

- AM: lectures.
- Migration principles.
- Definition of lithologies in basin modeling.
- Archimedes force, capillary pressure.
- PM: introduction to TemisFlow™ 2D module, exercises in TemisFlow™ 2D module, influence of parameters.

Session 2:

- AM: lectures.
- Oil & Gas generation.
- PVT and chemical composition.
- Velocity of hydrocarbon migration.
- PM: exercises with TemisFlow™ 2D module, influence of parameters.

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