



PetroMod Fundamentals

Course Introduction:

Petroleum systems modeling plays a crucial role in hydrocarbon exploration and risk assessment. PetroMod is a leading software solution used by geoscientists to model basin evolution, source rock maturation, hydrocarbon generation, migration, and accumulation. This training program on PetroMod Fundamentals provides participants with a strong theoretical foundation in petroleum systems modeling, covering the key concepts, methodologies, and workflows required for effective exploration decision-making.

Over five days, attendees will explore the principles of basin modeling, heat flow analysis, pressure and fluid flow dynamics, and risk assessment in hydrocarbon exploration. The course will emphasize the theoretical aspects of PetroMod without practical exercises, ensuring that participants gain a deep understanding of the geoscientific principles behind petroleum systems modeling. By the end of the training, participants will be equipped with the knowledge necessary to interpret basin models and integrate PetroMod workflows into exploration strategies.

Course Objectives:

Upon completion of this course, participants will:

- Understand the fundamental principles of petroleum systems modeling.
- Learn about the key inputs and processes involved in PetroMod simulations.
- Explore heat flow, thermal maturation, and kerogen transformation modeling.
- Gain insights into hydrocarbon migration mechanisms and accumulation processes.
- Understand the role of pressure and fluid dynamics in basin modeling.
- Learn risk assessment techniques in petroleum systems analysis.
- Explore case studies of basin modeling applications in hydrocarbon exploration.
- Stay informed on the latest advancements and future trends in petroleum systems modeling.

Who Should Attend?

This course is designed for professionals involved in Geologists and geophysicists in hydrocarbon exploration, Petroleum engineers and reservoir modelers, Basin modelers and petroleum systems analysts, Exploration and new ventures teams in oil and gas companies, Researchers and graduate students in geosciences, and Decision-makers involved in exploration risk assessment.

Course Outline:

Day 1: Introduction to Petroleum Systems Modeling and PetroMod

- Overview of petroleum systems modeling and its importance in exploration
- Introduction to PetroMod: Capabilities, workflow, and key applications
- Understanding basin evolution and geologic time scales
- Essential inputs for basin modeling: Stratigraphy, lithology, and geochemistry

Day 2: Heat Flow, Thermal Maturation, and Source Rock Evolution

- Fundamentals of heat flow and geothermal gradients
- Source rock maturation and kerogen transformation processes
- Vitrinite reflectance and thermal indicators for hydrocarbon generation
- Calibration techniques for thermal history reconstruction

Day 3: Hydrocarbon Generation, Migration, and Accumulation

- Hydrocarbon generation kinetics and expulsion mechanisms
- Primary and secondary migration processes: Darcy flow vs. buoyancy-driven migration
- Trap formation and hydrocarbon accumulation modeling
- Evaluating charge timing and preservation risks in petroleum systems

Day 4: Pressure, Fluid Flow, and Seal Integrity Analysis

- Understanding pressure systems in sedimentary basins
- Fluid flow mechanisms in basin modeling
- Seal integrity and fault modeling in PetroMod
- Overpressure prediction and its impact on hydrocarbon migration

Day 5: Risk Assessment, Case Studies, and Future Trends

- Uncertainty analysis and risk assessment in petroleum systems modeling
- Successful applications of PetroMod in hydrocarbon exploration
- Integration of seismic, well log, and geochemical data in basin modeling
- Emerging trends: AI-driven modeling, machine learning, and digital transformation in petroleum systems analysis
- Course review, Q&A session, and discussion on exploration decision-making

Course Methodology:

A variety of methodologies will be used during the course that including:

- (30%) Based on Case Studies

- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Fees:

To be advised as per course location. This rate includes participant's manual, Hand-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee / Tea
08:20 - 10:00	First Session
10:00 - 10:20	Coffee / Tea / Snacks
10:20 - 12:20	Second Session
12:20 - 13:30	Lunch Break & Prayer Break
13:30 - 15:00	Last Session