Training Courses
2019 Catalog

BeicipFranlab
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Courses	Duration	Geologist	Petro-physicist	Geo-chemist	Geo-physicist	Reservoir engineer	Page
OpenFlow Suite Installation & Configuration	1 day						3
Forward Stratigraphic Modeling with DionisosFlow 2019	5 days	✓	✓	✓			5
Advanced Workflows for Stratigraphic Modeling with DionisosFlow 2019	5 days	✓	✓	✓			7
Petroleum System Modeling with TemisFlow 2019	5 days	✓		✓	✓		9
Avanced Workflows for Petroleum System Modelling with TemisFlow 2019	5 days	✓		✓	✓		11
2D Kinematics for Basin Modeling with KronosFlow 2019	2 days	✓					13
Fractured Reservoirs Modeling with FracaFlow 2019	5 days	✓	✓			✓	15
Advanced Workflows for Fractured Reservoirs Modeling with FracaFlow 2019	5 days	✓	✓			✓	17
Reservoir Flow Simulation with PumaFlow 2019	5 days					✓	19
Advanced Workflows for Reservoir Flow Simulation with PumaFlow 2019	5 days					✓	21
Electrofacies analysis & Rock-Typing with EasyTrace 2019	5 days	✓	✓			✓	23
Organic Matter Content Estimation with EasyTrace 2019	2 days	✓	✓	✓			25
Seismic Reservoir Characterization with InterWell 2019	5 days	✓			✓		27

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OpenFlow™

Software Installation & Configuration

with OpenFlow Suite 2019

Duration: 1 day.

Objective: To provide attendees with concepts for *OpenFlow Suite* architecture and deliver proficient skills for the management and installation of the software.

Who should attend: IT personnel in charge of software.

Prerequisites: Basic knowledge in Windows and/or Linux OS, MySQL or Oracle database, licensing.

You will learn:

- *OpenFlow Suite* architecture
- *OpenFlow Suite* installation
- *OpenFlow Suite* configuration

Topic 1: **Introduction to Beicip-Franlab software solutions**

- *Interwell*
- *EasyTrace*
- *FracaFLow*
- *PumaFLow*
- *CougarFlow*

Topic 2: ***OpenFlow Suite* architecture and installation**

- *OpenFlow Suite* architecture
  - Architecture
  - Components
  - Review of *OpenFlow Suite* functions

- *OpenFlow Suite* installation
  - Installation steps
  - Troubleshooting

Topic 3: **OpenFlow Suite configuration**

- Configuration tools installation
  - Java memory management
  - Cache folder and log files
  - Linux Add-ons
  - Windows Add-ons
- Global overview of *OpenFlow Suite*
- *OpenFlow Suite* activities:
  - External activities
  - Internal activities
- Launching *PumaFLow* via command line

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DionisosFlow™

Forward Stratigraphic Modeling

with DionisosFlow 2019

Duration: 5 days.

Objective: To provide attendees with a conceptual background in stratigraphic modeling and deliver proficient skills for the use of *DionisosFlow*.

Who should attend: Geologists, geophysicists, geochemists who are involved in stratigraphic analysis and sedimentology.

Prerequisites: A minimum background in geology and sedimentology is recommended.

You will learn:

- Forward stratigraphic modeling in both clastic and carbonate environments from reservoir to basin scale
- Data import & interpretation
- Model construction and sensitivity of each input parameter (structural evolution, eustasy, supply, transport…)
- Post-processing analysis
- Results calibration & assessment.

Day 1: **Theory**

- Principles of sequence stratigraphy
- Principles of stratigraphic modeling with *Dionisosflow*
- Classical workflows

Day 2: **Clastic modeling**

- Data import
- Model domain definition
- Definition of the structural evolution, sediment supply and transport
- Simulation and post-processing analysis
- Focus and exercise on the transport parameters

Day 3: **Carbonates modeling**

- Model Building
- Definition of carbonate production, dissolution, environment constraints and wave impact
- Simulation and Post-Processing Analysis
- Model calibration through map computation and well comparison
- Facies Definition

Day 4: **Mixed environment modeling**

- Consolidation of the previously studied concepts
- Integration of all the elements within a real case mixed model
- Model building
- Simulation and post-processing analysis
- Model calibration
- Map extraction

Day 5: **Advanced exercises and/or practical session**

- Practical application with a calibration exercise
- Construction of a model with the user's data (optional)
- Q&A session

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DionisosFlow™

Advanced Workflows for Forward Stratigraphic Modeling

with DionisosFlow 2019

Duration: 5 days.

Objective: To provide attendees with an advanced knowledge of stratigraphic modeling concepts and deliver seasoned skills for the use of *DionisosFlow*.

Who should attend: Geologists, geophysicists, geochemists who are involved in stratigraphic analysis and sedimentology.

Prerequisites: A background in geology and sedimentology and the participation to the "Forward Stratigraphic Modeling with *DionisosFlow*" are recommended.

You will learn:

- Advanced post-processing
- Evaporites modeling
- Quantitative model calibration
- Risk & sensitivity analysis and multi-realization approach with *CougarFlow*

Day 1: **Advanced post-processing**

- Sequence map extraction
- Creation of CCRS maps
- Burial and stretching of the model to obtain a consistent present day grid
- Computation of advanced properties with a scripting tool

Day 2: **Evaporites modeling**

- General concepts
- Definition of the input parameters to constrain evaporites production and preservation
- Simulation and calibration
- Post-processing

Day 3: **Quantitative model calibration**

- Computation of a calibration indicator from well data for thickness and lithology
- Calibration exercise to assess the sensitivity of each input parameters

Days 4 & 5: **Uncertainty analysis with *CougarFlow***

- Uncertain input parameters definition
- Experimental design creation
- Response surface definition
- Sensitivity analysis to identify the most influential parameters
- Risk Analysis to assess the uncertainty on the output (P10, P50, P90)

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TemisFlow™

Petroleum System Modeling

with TemisFlow 2019

Duration: 5 days

Objective: To provide attendees with necessary knowledges in basin modeling concepts, handling with its uncertainties, and deliver proficient skills for the use of *TemisFlow*.

Who should attend: Professional geologists, geophysicists and geochemists who are involved in petroleum systems analysis and basin modeling.

Prerequisites: Some background in geology, geophysics or geochemistry is recommended.

You will learn:

- 2D & 3D model building
- Simulation: temperature, pressure, maturity, expulsion and migration
- Calibration
- Classic and advanced post-processing

Day 1: **Introduction to 2D basin modeling**

- General theory on basin modeling
- 2D section building
- Lithological & geochemical data management
- Erosion modeling
- Advanced thermal basement building
- PT simulation & calibration

Day 2: **Advanced 2D basin modeling**

- Full Darcy migration
- Advanced post-processing
- Practical application with a 2D exercise

Day 3: **Introduction to 3D basin modeling**

- Import & interpretation of map data
- Sedimentary model building
- Lithological & geochemical data management
- Erosion modeling
- Advanced basement building
- PT simulation
- Expulsion modeling
- Basic & advanced post-processing

Day 4: **Advanced 3D basin modeling**

- Fast Trap Charge Assessment with a Ray Tracing method
- 2D section extraction
- Map construction and management
- Practical application with a 3D exercise

Day 5: **Advanced exercises and/or practical session**

- Practical application with a calibration exercise
- Construction of a model with the user's data (optional)
- Q&A session

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TemisFlow™

Advanced workflows for Petroleum Systems Modeling

with TemisFlow 2019

Duration: 5 days.

Objective: To provide attendees with advanced knowledge in basin modeling concepts and deliver seasoned skills for the use of *TemisFlow*.

Who should attend: Professional geologists, geophysicists and geochemists who are involved in petroleum systems analysis and basin modeling.

Prerequisites: Some background in geology, geophysics or geochemistry and the participation to the "Petroleum Systems Modeling with *TemisFlow*" course are recommended.

You will learn: Expertise in the following topics to be chosen between:

- Salt restoration
- Advanced thermal modeling (new lithosphere module)
- Advanced pressure modeling (rock properties, diagenesis)
- Migration methods (ray-tracing, Darcy migration)
- Unconventional resources
- Sensitivity & risk analysis with *CougarFlow*
- Advanced post-processing

The content of this training has to be chosen between the following items.
Each item being one-day long, five of them should be selected.

Topic 1: **Salt restoration**

- Presentation of the different methods to handle salt in *TemisFlow*
- Application cases in 2D and 3D

Topic 2: **Advanced thermal modeling**

- Presentation of the new lithosphere module which allows a better characterization of the crust and mantle evolution through time
- Application cases in 2D and 3D

Topic 3: **Advanced pressure modeling**

- General theory on pore pressure prediction
- Study of the impact of rock properties and diagenetic effects on pore pressure results

Topic 4: **Migration methods**

- Presentation of the different migration methods available in *TemisFlow*
    - Ray-tracing
    - Decoupled and coupled Darcy flow
- Application cases in 2D and 3D

Topic 5: **Unconventional resources**

- General theory on the main elements impacting unconventional resources
    - Adsorption
    - Organic porosity
- Application case and calibration

Topic 6: **Uncertainty analysis with *CougarFlow***

- Uncertain input parameters definition
- Experimental design and response surface creation
- Sensitivity analysis to identify the most influential parameters
- Risk Analysis to assess the uncertainty on the output (P10, P50, P90)

Topic 7: **Advanced post-processing**

- Sequence map extraction
- Creation of CCRS maps
- Computation of advanced properties with a scripting tool

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TemisFlow™

2D Kinematics for Basin Modeling

with KronosFlow 2019

Duration: 5 days

Objective: To provide attendees with necessary knowledge in 2D kinematics for basin modeling concepts, and deliver proficient skills for the use of *KronosFlow*.

Who should attend: Professional geologists, geophysicists and geochemists who are involved in petroleum systems analysis and basin modeling.

Prerequisites: Some background in geology is recommended.

You will learn:

- To be specified
- To be specified

Day 1: **To be specified**

- To be specified
- To be specified

Day 2: **To be specified**

- To be specified
- To be specified

Day 3: **To be specified**

- To be specified
- To be specified

Day 4: **To be specified**

- To be specified
- Q&A session

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FracaFlow™

Fractured reservoirs modeling

with FracaFlow 2019

Duration: 5 days.

Objective: To provide attendees with concepts for natural fractured reservoir modeling and deliver proficient skills for the use of *FracaFlow*.

Who should attend: Geologists, petro-physicists, reservoir engineers involved in fracture reservoir development.

Prerequisites: Basic knowledge in structural geology and/or basic engineering.

You will learn:

- Geological analysis for faults and fractures
- Fault and fractures modeling
- Conductivities calibration
- Fracture equivalent parameters computation

Day 1: **Study methodology, software platform and data loading**

- Theoretical basic notions about naturally fractured reservoirs: characterization, modeling, simulation
- Overview of *OpenFlow Suite* platform:
  - Project settings, data management, import/export/ data visualization, etc.
  - Starting the study : data loading and quality check

Day 2: **Fracture characterization**

- Overview of possible analysis with available data
- Fracture characterization at wells :
  - Multi-wells analysis and well-by-well analysis
  - Orientation, dispersion and fracture sets creation
  - Fracture density log computation and fracturing facies analysis

Day 3: **Attributes analysis and characterization of faults**

- Curvature analysis and picking of lineaments
- Fault network characterization:
  - Fault sets creation, throw analysis and attributes computation
- Presentation of the different available types of model

Day 4: **Modeling**

- Creation of conceptual model:
  - Definition of the different model sets: facies-based, fault-related and faults from lineaments
  - DFN generation
  - Quality check (3D visualization, log viewer)

Day 5: **Calibration and upscaling**

- Model calibration with Kh data
- Fracture equivalent parameter computation
- Volumes calculation
- Final discussion and conclusions

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FracaFlow™

Advanced Workflows for Fractured Reservoirs Modeling

with FracaFlow 2019

Duration: 5 days.

Objective: To provide attendees with advanced knowledge in characterization and modeling of naturally fractured reservoirs and deliver seasoned skills for the use of *FracaFlow*.

Who should attend: Geologists, petrophysicists, reservoir engineers involved in fracture reservoir development.

Prerequisites: Some background in structural geology and/or basic engineering and the participation to the "Fracture reservoirs modeling with *FracaFlow*" are recommended.

You will learn:

- Dynamic data analysis
- Fault and fractures characterization and assessment of fracturing
- Fracture density driver computation
- Modeling, network connectivity analysis and upscaling
- Geomechanical analysis

Day 1: **Theory, quality check, dynamic data analysis**

- Review of theory about naturally fractured reservoirs (if necessary)
- Starting the study: quality check of available data
- Dynamic data analysis: flowmeters, well tests, production data, etc.

Day 2: **Fault & fracture characterization, assessment of fracturing**

- Fault networks characterization:
  - Lengths, fractal distribution
  - Fault sets creation and attributes computation
- Fracture characterization at wells:
  - Orientation, dispersion and fracture sets creation
- Dynamic data and geological data integration in QAF synthesis: finding clues of fractures at wells

Day 3: **Fracture density driver computation**

- Fracture density log computation and fracturing facies analysis
- Discriminant analysis with integration of different attributes and density driver computation
- Conditional simulation of density driver

Day 4: **Modeling, network connectivity analysis and upscaling**

- Presentation of the different types of models
- Conceptual model creation:
  - Definition of the different model sets: facies-based, fault-related and faults from lineaments
  - DFN generation and QC
  - Connectivity analysis
- Fracture equivalent parameters computation

Day 5: **Geomechanical analysis**

- Geomechanical data analysis at wells, identification of fractures at critical stress
- Geomechanical property computation at reservoir scale from analysis of constraint field perturbed by the faults
- Constraining fault-related fractures conductivity with the geomechanical property after Kh calibration at wells

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PumaFlow™

Reservoir Flow Simulation

with PumaFlow 2019

Duration: 5 days.

Objective: To provide attendees with necessary knowledge on reservoir simulation concepts and deliver proficient skills for the use of *PumaFlow*, *PVTFlow* and *CougarFlow.*

Who should attend: All reservoir engineers wishing to learn or improve their skills on reservoir flow simulation.

Prerequisites: Some background in reservoir engineering is recommended.

You will learn:

- Building a simulation model with *PumaFlow*
- Creating a PVT model within *PVTFlow* and using it in compositional simulation

Days 1 to 3: **Fundamentals and simulations construction**

Some of the skills that the trainee will learn through this day are:

- Prepare/create the data needed by the simulator
- Visualize and quality-check the data
- Build a black-oil context dynamic simulation
- Perform changes and modifications to the simulation.
- Analyze results using all available tools offered by *PumaFlow*
- Run predictions
- Perform classical history matching exercises

Days 4 & 5: **Fluid modeling and Compositional simulation**

A complete PVT study and modeling will be performed using *PVTFlow*:

- Data analysis.
- Fluid definition.
- Calibration of the fluid to the lab data.
- Component lumping.
- Export the fluid to perform a compositional simulation.

Then compositional simulation will be run:

- Create new traps with compositional PVT.
- Visualize and quality-check the data.
- Build a compositional dynamic simulation.
- Visualize and analyze results using all available tools offered by *PumaFlow*

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PumaFlow™

Advanced Workflows in Reservoir Flow Simulation

with PumaFlow 2019

Duration: 5 days.

Objective: To provide attendees with advanced knowledge on reservoir simulation concepts and deliver seasoned skills for the use of *PumaFlow* and *CougarFlow.*

Who should attend: All reservoir engineers wishing to learn or improve their skills on reservoir flow simulation.

Prerequisites: Some background in reservoir engineering and the participation to the "Reservoir Flow Simulation with *PumaFlow*" course are recommended.

You will learn: Expertise in the following topics to be chosen between

- Production enhancement using EOR processes
- Running uncertainties studies and history matching with *CougarFlow*
- Constructing a simulation model for a naturally fractured reservoir

The training content has to be customized with the following topics.

Topic 1 (3 days): **EOR processes**

Chemical EOR

- Theoretical course about the chemical EOR methods
- Construction of a dynamic simulation as a reference case
- Create chemical models for foam, polymer, surfactant and alkali chemicals in *PumaFlow* interface
- Perform an analysis of the chemical simulation results
- Perform advanced simulations using the key-word version of *PumaFlow*

CO_2 injection:

- Review of physical concepts: miscibility and dissolution of CO_2 in the water
- Generation of the CO_2 compatible PVT using *PVTFlow*
- Construction of a simple case to compare different recovery mechanisms (simple CO_2 injection, water flush, WAG cycles)
- Real case application of the theory on a Water Alternating Gas recovery

Topic 2 (2 days): **Uncertainties analysis & assisted history matching with *CougarFlow***

- Theory about management of Uncertainties in reservoir simulation
- Analysis of a case study in history matching context
- Sensitivity Analysis in order to identify the influential parameters on the historical data using *CougarFlow* methodology
- Optimization by using the most influential parameters on the Static Pressure and Water-Cut
- Definition of prediction scenario on optimized simulation
- Technical Risk Analysis on field production

Topic 3 (2 days): **Simulation of naturally fractured reservoirs**

- General concepts for the simulation of naturally fractured reservoirs and the influence of key parameters
- Recovery mechanisms for naturally fractured reservoirs
- Creation of dual porosity dual permeability models in *PumaFlow*
- Result analysis using all available tools in *PumaFlow*
- Insights for preparing future dual medium simulations in *PumaFlow*

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Easytrace

Electrofacies analysis for rock-typing

with EasyTrace 2019

Duration: 5 days.

Objective: To provide attendees with concepts for electrofacies analysis and rock-typing and deliver proficient skills for the use of *EasyTrace*.

Who should attend: Geologists, petro-physicists, reservoir engineers.

Prerequisites: Basic knowledge in diagraphy analysis is recommended.

You will learn:

- An integrated approach for facies analysis and rock-typing combining diagraphy, core description and petro-physical data from lab measurements (SCAL)

Day 1: **Getting started with *EasyTrace***

- Data management : study, import/export, wells, traces, markers and lithology
- Compute, edit, display data
- Tables, histogram, cross-plot
- Multigraph and correlation graph

Day 2: **Theory about eletrofacies and data analysis**

- Theory about eletrofacies analysis
- Data loading, data analysis and data quality check
- Choosing reference data
- Beginning the supervised analysis

Day 3: **Supervised and non-supervised analysis**

- Supervised analysis: method efficiency, results visualization/export
- Non-supervised analysis: multi-variate density analysis, results visualization/export
- Comparison with K-means method

Day 4: **Propagation and identification of rock-types**

- Combined interpretation using results from both methods
- Propagation to other wells in the database
- RCAL data integration for computing K-ϕ laws

Day 5: **PCA and SCAL data integration**

- Using Principal Component Analysis for integrating electrofacies and other data sources (mineral content on thin sections, petro-physical measurements on cores, etc.)
- Rock-typing method using SCAL data (capillary pressures)
    - Plug data management, classification
    - Modeling and computation of water saturation log

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Easytrace

Organic matter content estimation using Carbolog method

with EasyTrace 2019

Duration: 2 days.

Objective: To provide attendees with concepts for TOC computation with Carbolog method and its application and deliver proficient skills for the use of *EasyTrace*.

Who should attend: Geologists, petro-physicists, geochemists.

Prerequisites: Basic knowledge in diagraphy is recommended.

You will learn:

- TOC computation with Carbolog method

Day 1: **Getting started with *EasyTrace***

- Data management : study, import/export, wells, traces, markers and lithology
- Compute, edit, display data
- Tables, histogram, cross-plot
- Multigraph and correlation graph

Day 2: **Introduction aux roches mères (géochimie) et calcul du TOC avec Carbolog**

- Theory about source rock formation, TOC, organic matter types, Carbolog method and maturation
- Data loading and quality check
- TOC computation: choice of logs, poles edition, choosing computation parameters and displaying results

Day 3: **Results analysis**

- Results export at wells
- Using Interval Computation application for calculating an average TOC using cut-offs and displaying data in a map
- Interpretation and quality check of results

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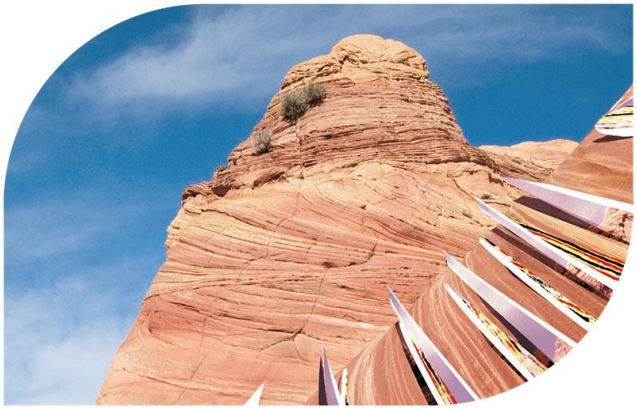
Interwell



Seismic reservoir characterization

with EasyTrace & InterWell 2019

Duration: 5 days.

Objective: To provide attendees with necessary knowledge on seismic inversion and application of a petro-elastic model to predict reservoir properties and deliver proficient skills for the use of *EasyTrace and InterWell*.

Who should attend: Geologists, geophysicist, involved in reservoir characterization.

Prerequisites: Some background in signal processing, and previous use of well logs and seismic data are recommended.

You will learn:

- Well data preparation (impedance generation, petro-elastic model definition)
- Quality check of seismic data
- Elastic seismic inversion
- Seismic characterization of the matrix

Day 1: **Methodology and well data preparation with *EasyTrace***

- Concepts and methodology in *EasyTrace* and *InterWell*
- Well data loading and display in *EasyTrace*
    - Density and P/S velocities logs reconstruction with semi-empirical models
- Impedance logs generation
    - Velocity law computation from sonic and seismic at well (check-shot, PSV)
    - Scaling of impedances and petro-physical results
- Petro-elastic model construction
    - Creation of a model for predicting lithology as a function of impedances
    - Classification test for evaluating the petro-elastic model predictability
    - Computing properties such as porosity as a function of impedance

Day 2: **InterWell database and seismic quality check**

- Data loading and quality check in *InterWell* (seismic data, well data and interpreted horizons)
- Data conditioning
    - Horizon processing, interpolation and extrapolation
    - Alignment of angle-stacks for correcting residual time-shifts
    - Multi-well & multi-seismic wavelet extraction and calibration

Day 3: **Modeling and inversion tests**

- Stratigraphic model construction
    - Choosing horizons and horizontal dip
    - Quality check of seismic velocity (if available)
- Modeling P-impedance, S-impedance and density
    - Interpolation and extrapolation of properties along the stratigraphy
    - Choosing an optimal filter for a-priori model
- Inversion parameters and their impact on final results

Day 4: **Final inversion and quality check**

- Comparison and control of test inversions results for selecting the final parameters
    - Display and quality-check of inversion results (2D section, maps, along well)
    - Final inversion computation
- Control and update of petro-elastic model with seismic inversion results

Day 5: **Seismic characterization of the matrix**

- Application of 3D discriminant analysis in *InterWell*
    - Generation of 3D cubes for lithology and associated probabilities
    - Comparison with well data
    - Adjusting the lithology with a probability threshold and porosity estimation
    - Constraint maps generation for geo-modeling