Course Description
Integrated Petroleum Engineering

Summary

The course “Integrated Petroleum Engineering” discusses the activities and interaction between the main subsurface disciplines in the exploration and development of oil and gas fields. Next to this the basics of economics and project management will be discussed.

The course starts with the discussion of geophysics, geology and petrophysics, followed by reservoir engineering basics, production technology and well engineering. The workflow of making a reservoir model with production forecasting will be discussed as a central point in which the disciplines come together.

The objective of the course is to further improve the efficiency of subsurface teams by understanding of the E&P field development and production optimization workflow and learning about the responsibilities of each discipline and identification of the critical interaction in teams. Ultimate goal is recovery and productivity optimization.

Topics like bypassed oil will be discussed as well as EOR and the production monitoring and optimization process.

The basics of economics and project management will be handled to complete the integration and understand the business drivers behind field development and production optimization.

At the end of this training event, participants will be able to:

- name the classical E&P workflow for field development and production optimization
- list the main disciplines involved in field development planning and production optimization
- recognize the most important activities per discipline and the required interaction between disciplines
- define the most critical parameters that are involved in making a reservoir model and forecast
- understand the process of well and reservoir performance optimization (infill drilling, stimulation, etc.)
- recognize the key aspects of enhanced oil recovery (EOR) applications
- identify important steps in project management
- identify important economic parameters

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The course is set-up for geoscientists and engineers working in subsurface teams:

- Geophysicists
- Geologists
- Petrophysicists
- Reservoir Engineers
- Production technologists
- Drilling engineers
- Project managers
- Any other interested parties

The course can be adjusted or extended according to the specific wishes of the client. For example, the technical content can be adjusted which makes the course suitable for government officials investors and bank employees who need to know more about the activities of their business partners.

Learning Level:

This training event is designed to achieve an Understand and Apply level.

Classroom requirements

The following equipment is required in the classroom: a beamer, flipchart, and/or white board.

Exercises & exam

During the course examples and exercises will be presented.

At the end there will be a final exam. Purpose is to rehearse the presented material and be able to find the information that is required to answer simple E&P questions.

Evaluation

A course evaluation form will be presented in order to allow future improvement of the course.

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Training Course Modules:

Module	Description
1 Introduction ± 1/2 day	The general E&P concepts, development, and production will be discussed in order to paint the overall picture of the integration of disciplines that is required to come from data to optimized hydrocarbon production.
2 E&P Disciplines ± 3 days	First, the main disciplines will be handled, based on the "classical" E&P workflow: 1. Geophysics 2. Geology 3. Petrophysics 4. Reservoir engineering 5. Production technology* 6. Well engineering (drilling & completion) The following topics will be discussed per discipline: activity, techniques, main interacting parameters, challenges, attention points, parameter usage per other discipline. This will result in an improved understanding of what the others are working on and what the others do with the data. Details like structural analysis, facies analysis, sensitivity analysis, and production forecasting will be discussed. At the end the relation with surface engineering and other disciplines will be highlighted (process, pipeline, construction
3 Production optimization ± 1/2 day	Topics: production monitoring, stimulation, infill drilling, EOR, etc. data management, decision making, etc.
4 Development and production planning ± 1/2 day	project management, development concepts, planning, permitting/legal, commercial, stake holder management, uncertainties/risks/mitigations, economics, investors & partners

Total duration	Min. 4 days - Max. 5 days
Number of Participants	t.b.d.
Location	t.b.d.
Pre-Study	No
Pre-Course Assessment	No
Evening Work	No

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About the Lecturer

Name: Cornelis Wouter Botermans

Educational Background:

Delft University of Technology, MSc. Petroleum Engineering (1996)

Professional Background:

Wouter Botermans has worked for Halliburton, Shell, BP, TAQA and Tulip Oil in the role of reservoir engineering, production technologist and field development lead. He was responsible for the integrated optimization of well, reservoir and system performance and for the development plan of the largest gas storage in Europe. In his role as development lead with Tulip Oil he was involved in the evaluation of numerous opportunities and the composition of development plans, portfolio management and economics. Currently Botermans is freelance petroleum engineer focusing on recovery and productivity optimization, training and consultancy.

Personal Motivation to Lecture:

It is very rewarding and motivating to deliver a solid proposal for any development plan or well intervention that is composed and supported by the team. The recognition of the importance of the contribution of every discipline in the E&P process will provide the basis of successful execution and operation to create value for the organization. In my role as petroleum engineer, I had the pleasure to work with many people on numerous topics crossing discipline borders and creating mutual understanding of the subsurface and expectations.

Mr. Botermans is married and has 3 children. His main hobbies are sports, photography and cars.

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