



## Reservoir Modeling of Heavy Oil Resources - HORM

### COURSE

#### About the Course

As conventional oil reserves decline, more emphasis is placed on heavy oil and bitumen. Heavy oil and bitumen are plentiful in many developed oil provinces, as well as in areas with no conventional oil. As with conventional oil, the reservoir engineering aspects of the development of heavy oil and bitumen is aided by modeling of various kinds. For heavy oil and bitumen, the modeling is complicated by the high oil viscosity and the need for enhanced oil recovery techniques, usually involving heating of the reservoir to produce the oil at commercial rates. In this course, modeling is understood as a part of reservoir engineering and includes the use of analogues and analytical modeling, as well as numerical simulation. The emphasis is on numerical simulation, but analytical techniques are also examined in some detail, since they provide considerable insight into the recovery process. The emphasis of the course is on HOW to perform a successful heavy oil simulation study, including factors to be considered, pitfalls to avoid, testing of models, examination of output, and ensuring results are reliable. Note that this course does NOT teach details of data input for a particular program, advice on selection of software, detailed comparison of features of different software, or a cookbook on how build a model. Examples from the literature, conceptual models, and class exercises are used to illustrate various points, as well as highlight the uncertainties and limitations of current knowledge and technology. The course includes the use of computers, which are provided at additional cost. The only software required is a spreadsheet and text editor for the exercises.

#### Target Audience

Petroleum and reservoir engineers who will be actively working on studies, and be involved in assessing the results of studies.

#### You Will Learn

Participants will learn how to:

- Select the type of modeling required to meet the aims of the study
- Design different types of modeling studies to achieve the aims of the study (feasibility, operating strategy, development plan, ultimate recovery, etc.)
- Collect and select the data for the study
- Incorporate field observations into the study (production data, pressure data, 4D seismic, observation well data)
- Set up, run, and test the model(s)
- Assess the adequacy of the history match(es)

- Create and run different development options and assess the results
- Assess the results of third party studies (in-house or external)

## Course Content

- Introduction (definitions of heavy oil, types of study, types of modeling, design of study, grid effects, binary screening)
- Basic reservoir engineering and reservoir characterization (overview of reservoir engineering techniques and their limitations for heavy oil, types of geological models, introduction to geostatistical models)
- Rock and fluid data for heavy oil (oil viscosity, thermal properties of reservoir, temperature dependence of relative permeability, etc.)
- Non-thermal recovery of heavy oil (cold heavy oil production with sand, chemical flooding, VAPEX, immiscible gas flooding)
- Thermal recovery using steam (cyclic steam stimulation, steamflood, steam-assisted gravity drainage)
- Thermal recovery without steam (in-situ combustion, electrical heating, hot water flood, steam with additives)

## Product Details

Categories: [Upstream](#)

Disciplines: [Reservoir Engineering](#)

Levels: [Intermediate](#)

Product Type: [Course](#)

Formats Available: [In-Classroom](#)

Instructors: [PetroSkills Specialist](#)