



<b>Course Description:</b>	<b>Petroleum Reservoir Rock &amp; Fluid Properties</b>
<b>Course Location</b>	In client offices worldwide
<b>Course Description</b>	Fundamental concepts of reservoir rock and fluid properties including porosity, absolute permeability, fluid saturations, wettability, capillary pressure, relative permeabilities, phase behavior of model and real reservoir fluids, classification of petroleum reservoirs by fluid types, compositional analyses of reservoir fluids, PVT analyses and reservoir fluid properties and hydrocarbon vapor-liquid equilibria.
<b>Who Should Attend</b>	This course provides a balanced coverage of basic as well as advanced concepts in the area of petroleum reservoir rock and fluid properties, which is a backbone of virtually all activities in the petroleum industry. The manner in which this course is structured makes it very attractive to geologists, reservoir engineers, drilling engineers, production engineers, other engineers diversifying into the petroleum engineering field or for that matter anyone with an engineering background who wants to learn about petroleum reservoir rock and fluid properties. Additionally, personnel engaged in laboratory studies in support of SCAL & PVT and reservoir fluid studies will also find this course a valuable resource. Overall, this course plays a particular role in preparing a strong foundation in the area of rock and fluid properties.
<b>Course Length</b>	5 days
<b>Course Materials</b>	Copies of the slides and a certificate of participation
<b>Course Contacts</b>	Please email us at <a href="mailto:info@hydrafact.com">info@hydrafact.com</a>
<b>Course Director</b>	Abhijit Dandekar is currently the professor and chair of petroleum engineering at the University of Alaska Fairbanks (UAF), where he has taught since January 2001. Before joining UAF, he was an assistant research professor at the Technical University of Denmark. In the summer of 2002 he also worked as visiting faculty at the University of Petroleum Beijing, P.R.C. He has also been a visiting professor at the African University of Science and Technology (AUST) in Abuja, Nigeria. He holds a B.Tech degree in chemical engineering from Nagpur University, India and a Ph.D. degree in petroleum engineering from Heriot-Watt University, Edinburgh, UK. Abhijit Dandekar is an active member of SPE and the author or co-author of over 30 peer-reviewed technical papers, over 45 technical conference papers in the petroleum literature and numerous research reports, in areas as diverse as special core analysis, PVT and phase behavior, gas-to-liquids, gas hydrates, viscous oils, wettability alteration and CO2 sequestration. He is also the author of the CRC Press book Petroleum Reservoir Rock and Fluid Properties.



**Course Content**

**Day 1:**

**Introduction to petroleum reservoir rock and fluid properties**

**Brief discussion of coring methods**

**Porosity and absolute permeability**

- Significance and definitions
- Methods of measurement
- Relevance in reservoir engineering

**Day 2:**

**Fluid Saturations**

- Significance of fluid saturations
- Methods of measurement
- Critical gas saturation, irreducible water saturation and residual oil saturation
- Assessing the reliability of fluid saturations from mass balances
- Factors affecting fluid saturations
- Relevance in reservoir engineering

**IFT and wettability concepts**

- Significance and definitions
- Methods of measurement
- Practical aspects of wettability

**Capillary pressure**

- Development of mathematical expressions for capillary pressure
- Methods of measurement
- Conversion of laboratory capillary pressure data to reservoir conditions

**Examples of practical application of capillary pressure data**



**Course Content**

**Day 3:**

**Relative permeability**

- Fundamental concepts and definitions of relative permeability
- Salient features of gas-oil and oil-water relative permeability curves
- Corey exponents
- Three phase relative permeability
- Examples of practical application of relative permeability data

**Introduction to petroleum reservoir fluids**

**Phase behavior fundamentals and phase behavior of the 5 reservoir fluids**

**Day 4:**

**Brief discussion on sampling of petroleum reservoir fluids**

**Compositional analyses of petroleum reservoir fluids**

**PVT analysis and reservoir fluid properties**

- Idea and real gas equations, Z factors, mixing rules and gas density
- Dry and wet gas properties and recombination equations
- Black oil properties
- Laboratory PVT equipment
- Laboratory tests on CCE, DL, CVD and separator tests
- Adjustment of black oil PVT data

**Day 5:**

**Hydrocarbon vapor-liquid equilibria**

- Development of PT flash calculation equations
- Introduction to equilibrium ratios
- Calculation of saturation pressures using ideal solutions principle
- Flash calculations
- Application of Wilson and Whitson-Torp equations for flash calculations
- Introduction to EOS models

**Introduction to formation water properties**