

Workshops

Petroleum Geology for the Non-Geologist

Janice Gillespie, California State University, Bakersfield

This course is designed to help non-geologists in petroleum-related fields understand just what all these geologists are talking about! We'll discuss why oil is found in some areas and not in others, what kinds of tools geologists use to assess the petroleum potential and petroleum reserves in an area and what factors they consider when deciding where to drill. During the class, you will work as part of a team of "geologists" that will come up with several "prospects" for drilling. By the end of the day, we hope that you will understand that oil is truly a limited resource and takes considerable skill to find and develop.

Course Outline

- Oil and Gas—sources and maturation
 - Composition—CH as gas vs. liquid
 - Properties—light vs. heavy, sweet vs. sour
 - Sources
 - Source maturation—the kitchen
- Rock Types—reservoirs and seals
 - Sedimentary Rocks—
 - Porosity and Permeability—logs and cores
 - What kinds of rocks act as reservoirs?
 - Where do they form?
 - Basins
 - Non Marine
 - Shallow Marine
 - Deep Marine
 - Facies Changes
- Exercise Part 1—learn to interpret an ancient landscape using SP logs and sand thickness maps
- Traps
 - Folds, role of seismic
 - Structure contour maps and fluid contacts
 - Faults
 - Stratigraphic traps
 - Finding oil on electric logs
- Exercise Part 2—Structure maps and prospect generation using Part 1 sand maps

Instructor

Dr. Janice Gillespie Dept. of Geology, California State University, Bakersfield, CA. Responsible for supervising research projects and teaching upper division and graduate-level courses in petroleum, ground water and GIS (ArcGIS, GeoGraphix, LandMark). Served as department chair from 2003 to present. Chair responsibilities include scheduling, staffing and budgeting for both Physics and Geology departments. Janice received her PhD in Geology from the University of Wyoming, Master Degree in Geology from South Dakota School of Mines, and her Bachelor Degree in Geology from Bemidji State University.

Economic and Financial Aspects of Petroleum Property Evaluation **Richard Miller, Richard J. Miller & Associates, Inc.**

This course will examine selected issues in the evaluation of oil and gas properties with a focus on economic and financial considerations which have impacts on an evaluation.

Course Outline

- What is oil and gas property evaluation?
 - Application of Geology, Engineering and Economics
 - Purposes and Uses of property/project evaluation
- Economic Aspects of Evaluation
 - Product Prices
 - Operating Costs
 - Production and Other Taxes
 - Capital Expenditures, Scheduling and Budgeting
 - Sources of Funding
 - Regulatory Costs and Constraints
- Financial Considerations
 - Comparative Methods of valuation
 - Sources and Application of Discount rates and other
- Comparative Tools
 - Should I Just Ignore the equity?

Instructor

Mr. Miller is an Accredited Senior Appraiser (ASA) with a speciality in Oil and Gas Property appraisal. He holds a BS in Petroleum Engineering (1967) from the New Mexico Institute of Mining and Technology and holds MS (1970) and MBA (1976) degrees from the University of Southern California.

Mr. Miller began his career as a petroleum engineer with Texaco, Inc. in California and Trinidad, West Indies. He was later employed by James A. Lewis Engineering and United California Bank. Mr. Miller founded Richard J. Miller & Associates, Inc. in 1978. The firm provides oil, gas and geothermal property evaluation services to a wide range of clients in the U.S and Canada. Richard J. Miller & Associates, Inc. specializes in the appraisal of oil and gas producing properties primarily for ad valorem tax and estate tax.

Mr. Miller is the author of numerous technical papers on petroleum property appraisal and particularly the development of market valuation criteria such as discount rate and is the author of a book section on oil property evaluation. In addition to being a member of ASA and AAPG, Mr. Miller is a former chairman of the Los Angeles Basin section of the Society of Petroleum Engineers and was the national President of the Society of Petroleum Evaluation Engineers in 2000.

Introduction to Open Hole Logging

Janice Gillespie, California State University, Bakersfield

This course is for those who are interested in learning how to read and do simple interpretations with basic open hole wireline logs. Emphasis will be on older logs that are common in mature California basins. The types of logs covered are resistivity, spontaneous potential (SP), sonic, gamma, density and neutron. Interpretations will include:

Recognizing the presence of gas, oil and salt water

Using quick look analysis to identify potential producing zones

Estimating reservoir quality

Estimating water/oil saturation using a simple Archie Equation

Short exercises will be included as part of the course so be sure to bring a calculator that does exponents (for Archie's Equation).

Attendants will also receive the workbook "Well Logging Methods", Publisher University of Texas.

Course Outline

- Borehole environment and log header and scales
- Electrical logs-Resistivity and SP
- Radioactive logs-GR, Neutron, Density
- Water saturations using Archie's equation
- Final exercises

Instructor

Dr. Janice Gillespie Dept. of Geology, California State University, Bakersfield, CA. Responsible for supervising research projects and teaching upper division and graduate-level courses in petroleum, ground water and GIS (ArcGIS, GeoGraphix, LandMark). Served as department chair from 2003 to present. Chair responsibilities include scheduling, staffing and budgeting for both Physics and Geology departments. Janice received her PhD in Geology from the University of Wyoming, Master Degree in Geology from South Dakota School of Mines, and her Bachelor Degree in Geology from Bemidji State University.

Oil & Gas Permitting, CEQA and Environmental Issues

Sam Sarem: President, Improved Petroleum Recovery Consultants; Grace Brandt, California Division of Oil and Gas; Joe Hower, Environ Corp.

This class is designed to discuss oil and gas permitting in California and the CEQA process. Environmental issues addressing California producers will be discussed including environmental solutions.

Course Outline

- The Environmental Effects of the Oil Industry:
 - Pollution Management (water, waste & air emissions)
 - Pollution Control
 - Pollution Prevention
- California Environmental Quality Act (CEQA):
 - CEQA Basics
 - CEQA Process
 - CEQA Exemptions
 - CEQA Decisions
- DOGGR permitting process:
 - Laws & Regulations
 - Well Bonding
 - Well Permitting Process

Instructors

Grace Plaza Brandt is an associate engineer with the Division of Oil, Gas and Geothermal Resources (Division), California Department of Conservation. She has been employed by the Division for almost twenty years. She was assigned to various engineering programs & duties as Geothermal engineer at Santa Rosa Geothermal District, Field engineer, Construction Site Review engineer, and Operations Permitting engineer. Currently, she is working as an Underground Injection Control Permitting engineer. Grace has a BS Degree in Industrial Engineering from California State University, Long Beach.

Dr. Sam Sarem, PE: President, Improved Petroleum Recovery Consultants, Yorba Linda, CA Unocal Science and Technology, Brea, CA, 28 years, Lab and Field Research on Enhanced Oil Recovery, Computer Modeling, Pressure Transient Analysis, Pipeline Flow Improvement, Well Damage Diagnosis and Mitigation. Reservoir Engineering Manager, Staff Consultant in Production and Development Research (Highest Technical Position). Sinclair Research, Tulsa Oklahoma, 10 Years, Lab and Field Research on Fluid Flow and HC Phase Behavior near Critical Point. Sam has taught many petroleum undergraduate and graduate courses such as a recent graduate course on the Environmental Technology in the Petroleum Industry at USC. Sam is the current SPE Western North American Region Director, 2009-12.

Joe Hower, PE, DEE: Mr. Hower is the Managing Principal and Air Quality Practice Leader of ENVIRON International Corporation's Southern California operations and is based out of Los Angeles. He has 30 years of experience in air quality management, including greenhouse gas mgmt, regulatory compliance, permitting, litigation support, expert witness work, risk mgmt, and pollution control engineering. Specific projects have ranged from Title V permit evaluations to managing the installation and start-up of multi-million dollar air pollution control systems. Joe received his MS degree in Mechanical Engineering from University of Southern California.

Thermal Oil Recovery

Tony Kovscek, Louis Castanier, Stanford University

Steam injection, and thermal recovery in particular, is the most popular enhanced oil recovery method. This one-day course is intended to cover thermal recovery principles and practice from analytical models for vertical wells to field-scale simulation. Both steam injection and in-situ combustion methods are examined. The course consists of lecture, examples, and case studies.

Course Outline

- Heavy-oil overview: physical properties and thermal recovery processes/potential
- Fundamentals of thermal recovery: viscosity versus temperature functions, and thermal expansivity of oil and rock
- Fundamentals of thermal recovery: viscosity versus temperature
- Analytical and semi-analytical models for evaluation of cyclic steam and steam-drive recovery efficiency.
- Wellbore heat losses
- Case studies of field implementation
- Overview of steam assisted gravity drainage
- In-situ Combustion from laboratory tests to field studies

Who should attend

This course is intended for engineers and geologists who wish to expand their knowledge of thermal recovery methods and heavy oil. Primarily a reservoir engineering viewpoint is taken. Prior experience with steam injection, in-situ combustion, and heat and mass transfer in porous media is not assumed.

Instructors

Dr. Tony Kovscek is an Associate Professor of Energy Resources Engineering and Director of the SUPRI-A project on Thermal and Unconventional Hydrocarbon Recovery. He holds PhD and BS degrees from the University of California, Berkeley and the University of Washington, respectively.

Louis Castanier is Technical Manager of SUPRI-A. He holds PhD, ME, and BS degrees from Toulouse University. Collectively, the SUPRI-A group has contributed over 250 reports and papers on thermal and heavy oil recovery to the literature.

Introduction to Petroleum Engineering

Mason Medizade, Petrolects, LLC

This half day intensive course discusses petroleum geology, exploration methods, reservoir rocks, reservoir fluids, reservoir rock and fluid systems, fluid flow in porous media, types of reservoirs, reserve estimation, primary, secondary, and tertiary recoveries.

Course Outline

- Reservoir Fluid Properties, Brine, Oil, and Gas
- Reservoir Rock Properties, Permeability, and Porosity
- Reservoir Rock and Fluid Properties, Fluid Saturations, Capillary Pressure, Relative Permeability Concept, and J Function
- Fluid Flow in Porous Media, Linear, Radial Flow, Compressible, and Incompressible Flow
- Oil and Gas Reservoir Classifications
- Primary, Secondary, and Tertiary Productions
- Oil and Gas Reserve Estimation Methods
- Definition of Enhanced Oil Recovery Methods, Water Injection, Gas Injection, Steam Injection, etc

Instructor

Dr. Mason Medizade has twenty five years of experience in the oil and gas industry, worldwide. His oilfield experience spans from reservoir engineering, drilling & completion, to enhanced oil recovery, and petroleum production. Specifically, he has done engineering work related to real time production monitoring, production enhancement, drilling fluids, reserve estimation, filtration, sand control, surface facility design, and reservoir management. He has been involved in consulting, research and teaching in renewable and non-renewable energy sources since 1984. Dr. Medizade is president of Petrolects, LLC. Petrolects is a petroleum engineering consulting and training services company focusing in digital oilfields.

Dr. Medizade has been a faculty member in the mechanical engineering department at Cal Poly State University in San Luis Obispo where he focuses on energy, thermodynamics and fluid mechanics. Professor Medizade has taught numerous, short courses in petroleum engineering to clients such as California Division of Oil and Gas, Petroleum Technology Transfer Council, PTTC, Texaco, NIOC, Pertamina and others. Dr. Medizade is an active member of the Society of Petroleum Engineers and many other professional societies. He has authored numerous technical papers and won different awards and certificates for his teaching and research work. He holds PhD and MS degrees from USC in petroleum engineering and BS in chemical engineering from Abadan Institute of Technology, AIT in Abadan, Iran.

Facility Engineering for Non-Facilities Engineers

Lisa Denke, DCCK Engineering

This workshop will describe the flow of fluids through typical oil field facilities. The workshop is geared for people who do not currently work in facilities, but want to become familiar with how the plants and gathering systems work.

Course Outline

- Gathering systems and testing
- Oil dehydration
- Water processing
 - Oil removal
 - Filtration
 - Softening for steam service
- Steam generation
- Piping

Instructor

Lisa Denke is a project manager with DCCK Engineering. Her experience includes drilling, completion, production and surface facilities engineering with Dowell Schlumberger, Texaco, Aera Energy LLC, TJ Cross Engineers, and Berry Petroleum Company. She has a BSEE from the University of Wyoming, and additional graduate work in geology at California State University, Bakersfield.

Streamline Simulation for Reservoir Surveillance and Flood Management - Marco Thiele, Streamsim Technologies

Streamline-based (SL) flow simulation has traditionally been viewed as a modeling approach that is complementary to other flow simulation methods. However, streamlines are also ideally suited to the much more common application of reservoir surveillance of mature floods. Because the streamline paths themselves yield well drainage regions and well-pair allocation factors, engineers can easily reduce complex production data down to the pattern level. Streamline based patterns then highlight areas of fluid cycling vs efficient use of injected fluids, or longer term metrics such as overall pattern sweep efficiencies. Furthermore, knowing well pair connections and pattern efficiencies also provides the basis of flood optimization via updated well rate targets. The elegance of a streamline-base surveillance model is that it accounts for historical flow rates, well geometry, and any level of field geology, meaning it is not subject to an engineer's "best guess" of implied patterns. These models can be quick to build and easy to run, yet are surprisingly robust when compared with more detailed history match flow simulation models. In fact, given the ease with which streamline-based surveillance models can be constructed, any large mature water or miscible flood should have a streamline-based surveillance model, as it is another way to interpret the production/injection data.

Course Outline

- Introductory concepts of streamline simulation
- Using streamlines to build surveillance models
 - Well Allocation Factors
 - Injection Efficiency and Conformance Plots
 - Examples
- From surveillance to predictive models
 - Streamline-based flow simulation models
 - The need for history matching
 - Managing a flood using SL-derived data
 - Examples
- Wrap-Up
 - Pros and cons of SL simulation
 - Other possible applications & SL-based workflows
 - Discussion

Instructor

Dr. Marco R. Thiele is president of Streamsim Technologies, a software company specialized in the development and application of streamline simulation technology to modern reservoir simulation practices. He is also a Consulting Professor in the Department of Energy Resource Engineering at Stanford University. He received his PhD in Petroleum Engineering from Stanford University in 1994 and his MS and BS from the University of Texas at Austin in 1989 and 1986, respectively. He is the recipient of the 1996 SPE Cedric K. Ferguson Medal, and winner of 1994 International SPE Student Paper Contest. He is an associate editor for the SPE Reservoir Evaluation and Engineering Journal, and serves on the SPE Books Committee. He has published widely on reservoir flow modeling and application of streamline-based flow simulation to reservoir engineering, and is a frequent invited speaker on the topic at international conferences and symposiums.

Drilling Engineering 101

Val Lerma, Orchard Petroleum

This course is designed to introduce drilling concepts to the novice. The presentation is based on the book, Applied Drilling Engineering, an SPE text book available online. Topics covered include initial preparation for drilling operations, mud, cement, bit and casing design considerations. **BE SURE TO BRING A CALCULATOR TO CLASS.** If you have the text book, please bring that as well.

Course Outline

- The Drilling Rig and Laying the Groundwork to Drill
 - People
 - Research
 - Permits
 - Equipment
 - Exercises and Discussion
- Mud
- Functions
- Properties
- Treatment and Diagnostic Tests
 - Solids Control Equipment and Costs
 - Exercises and Discussion
- Cement
- Language of Cement
- Cement Additives
- Types of Cementing
 - Exercises and Discussion
- Bits
 - IADC Code
 - Rate of Penetration
 - Bit Grading
 - Economics of pulling bit
 - Exercises and Discussion
- Casing
- Types of Casing
- Connectors
- Design Criteria
- Exercises and Discussion

Instructor

Val Lerma began her career with Chevron in 1982 as a company well site supervisor on both on and offshore drilling rigs. After 8 years at Chevron, she started her own engineering practice as Troy Consulting. Val consulted on numerous drilling, production, and reservoir engineering projects for Chevron, PXP, Aera, Venoco, and various small independent operators for LA Basin and Ventura oil fields. She joined Orchard in 2005, and became president this in 2009.

Val has participated in numerous PTTC workshops which included teaching a segment on well abandonment procedures. She has been teaching the Drilling Engineering class at USC since 2003. She has been a member of SPE since 1978, has authored and co-authored several technical papers, and served on the SPE board in Ventura. Val has BS and MS degrees in petroleum engineering from USC, and an MBA from California Lutheran University. She is also a registered professional engineer in the State of California.

