COURSE OVERVIEW DE0430
Pressure-Volume-Temperature (PVT) Fundamentals, Measurements & Synthesis

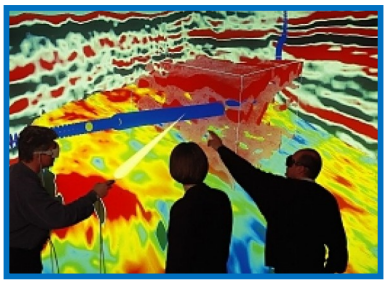
Course Title
Pressure-Volume-Temperature (PVT) Fundamentals, Measurements & Synthesis

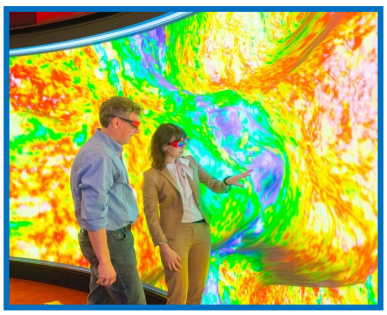
Course Date/Venue
Session 1: July 14-18, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
Session 2: December 21-28, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference
DE0430

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description



This practical and highly-interactive course includes real-life case studies where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with a detailed and up-to-date overview of Advanced Pressure-Volume-Temperature (PVT) and Equation of State (EOS) Characterization. It covers the PVT analysis and its importance in reservoir engineering and applications in the oil and gas industry; the phase behavior of hydrocarbon systems; the techniques for hydrocarbon sample collection and experimental methods used in PVT analysis; the fluid properties in reservoir conditions, equations of state (EOS) basics concepts and the common EOS models; parameterizing EOS models to match experimental PVT data; and the advanced methods for tuning EOS parameters to improve model accuracy using regression techniques.

Further, the course will also discuss the mixing rules in EOS models and their application to multi-component hydrocarbon systems; the volume translation and density calculations; using EOS models to visualize phase behavior; constructing phase diagrams for reservoir fluids; and analyzing compositional gradients and reservoir fluid grading using PVT data.

During this interactive course, participants will learn the asphaltene precipitation and wax formation including PVT modeling of complex fluids and thermodynamic models for hydrate formation; the EOS for unconventional reservoirs, software tools for PVT and EOS analysis; the challenges and future research directions in PVT analysis and EOS characterization; the PVT and EOS data in field development planning and decision-making processes; integrating PVT data with reservoir management strategies; the impact of PVT analysis on production forecasting; and utilizing PVT analysis in the evaluation and acquisition of oil and gas assets.

Course Objectives

Upon the successful completion of this course, each participant will be able to: -

- Apply and gain an advanced knowledge on pressure-volume-temperature (PVT) and equation of state (EOS) characterization
- Discuss PVT analysis and its importance in reservoir engineering and applications in the oil and gas industry
- Recognize the phase behavior of hydrocarbon systems and apply techniques for hydrocarbon sample collection and experimental methods used in PVT analysis
- Identify the fluid properties in reservoir conditions, equations of state (EOS) concepts and the common EOS models
- Parameterize EOS models to match experimental PVT data and apply advanced methods for tuning EOS parameters to improve model accuracy using regression techniques
- Mix rules in EOS models and their application to multi-component hydrocarbon systems
- Carryout volume translation and density calculations as well as use EOS models to visualize phase behavior and construct phase diagrams for reservoir fluids
- Apply PVT analysis in reservoir simulation and discuss the role of PVT in well test analysis
- Examine the role of PVT analysis in designing and optimizing EOR projects
- Use PVT analysis to evaluate gas injection strategies and miscibility conditions for EOR
- Analyze compositional gradients and reservoir fluid grading using PVT data
- Discuss asphaltene precipitation and wax formation including PVT modeling of complex fluids and thermodynamic models for hydrate formation
- Recognize the EOS for unconventional reservoirs, software tools for PVT and EOS analysis and current challenges and future research directions in PVT analysis and EOS characterization
- Apply PVT and EOS data in field development planning and decision-making processes
- Integrate PVT data with reservoir management strategies and discuss the impact of PVT analysis on production forecasting
- Utilize PVT analysis in the evaluation and acquisition of oil and gas assets

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend?

This course provides an overview of all significant aspects and considerations of advanced pressure-volume-temperature (PVT) and equation of state (EOS) characterization for reservoir engineers and petroleum engineers who have a medium background of PVT.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours: -

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Fee

US$ 8,000 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Mr. Konstantin Zorbalas, MSc, BSc, is a **Senior Petroleum Engineer & Well Completions Specialist** with over **30 years** of **offshore** and **onshore** experience in the **Oil** & **Gas**, **Refinery** & **Petrochemical** industries. His wide expertise includes **Workovers & Completions**, **Petroleum Risk & Decision Analysis**, **Acidizing Application** in **Sandstone** & **Carbonate**, **Well Testing Analysis**, **Stimulation Operations**, **Reserves Evaluation**, **Reservoir Fluid Properties**, **Reservoir Engineering & Simulation Studies**, **Reservoir Monitoring**, **Artificial Lift Design**, **Gas Operations**, **Workover/Remedial Operations** & **Heavy Oil Technology**, **Applied Water Technology**, **Oil & Gas Production**, **X-mas Tree** & **Wellhead Operations** & **Testing**, **Artificial Lift Systems** (**Gas Lift**, **ESP**, and **Rod Pumping**), **Well Cementing**, **Production Optimization**, **Production Operations**, **Well Completion Design**, **Sand Control**, **PLT Correlation**, **Slickline Operations**, **Acid Stimulation**, **Well testing**, **Production Logging**, **Project Evaluation** & **Economic Analysis**. Further, he is actively involved in **Project Management** with special emphasis in production technology and field optimization, performing conceptual studies, economic analysis with risk assessment and field development planning. He is currently the **Senior Petroleum Engineer & Consultant** of **National Oil Company** wherein he is involved in the mega-mature fields in the Arabian Gulf, predominantly carbonate reservoirs; designing the acid stimulation treatments with post-drilling rigless operations; utilizing CT with tractors and DTS systems; and he is responsible for gas production and preparing for reservoir engineering and simulation studies, well testing activities, field and reservoir monitoring, production logging and optimization and well completion design.

During his career life, Mr. Zorbalas worked as a **Senior Production Engineer**, **Well Completion Specialist**, **Production Manager**, **Project Manager**, **Technical Manager**, **Technical Supervisor** & **Contracts Manager**, **Production Engineer**, **Production Supervisor**, **Production Technologist**, **Technical Specialist**, **Business Development Analyst**, **Field Production Engineer** and **Field Engineer**. He worked for many **world-class oil/gas companies** such as **ZADCO**, **ADMA-OPCO**, **Oilfield International Ltd**, **Burlington Resources** (later acquired by **Conoco Phillips**), **MOBIL E&P**, **Saudi Aramco**, **Pluspetrol E&P SA**, **Wintershall**, **Taylor Energy**, **Schlumberger**, **Rowan Drilling** and **Yukos EP** where he was in-charge of the **design and technical analysis** of a gas plant with capacity **1.8 billion m3/yr gas**. His achievements include **boosting oil production 17.2% per year** since 1999 using **ESP** and **Gas Lift systems**.

Mr. Zorbalas has **Master's** and **Bachelor's** degree in **Petroleum Engineering** from the **Mississippi State University**, **USA**. Further, he is an **SPE Certified Petroleum Engineer**, **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**), an active member of the Society of Petroleum Engineers (**SPE**) and has numerous scientific and technical publications and delivered innumerable training courses, seminars and workshops worldwide.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction to PVT Analysis:*** *Overview of PVT Analysis, its Importance in Reservoir Engineering & Applications in the Oil & Gas Industry*
0930 – 0945	*Break*
0945 – 1030	***Phase Behavior of Hydrocarbon Systems:*** *Detailed Examination of Hydrocarbon Phase Behavior, including Phase Envelopes & Critical Points*
1030 – 1130	***Sampling & Experimental PVT Studies:*** *Techniques for Hydrocarbon Sample Collection & Experimental Methods Used in PVT Analysis*
1130 – 1215	***Fluid Properties in Reservoir Conditions:*** *The Key Fluid Properties Under Reservoir Conditions, such as Bubble Point, Dew Point & Viscosity*
1215 – 1230	*Break*
1230 – 1330	***Equations of State (EOS) Basics:*** *EOS Concepts & their Role in Characterizing PVT Properties of Reservoir Fluids*
1330 – 1420	***Common EOS Models:*** *Overview of Commonly Used EOS Models, including Peng-Robinson & Soave-Redlich-Kwong Models*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Parameterization of EOS Models:*** *Techniques for Parameterizing EOS Models to Match Experimental PVT Data*
0830 – 0930	***EOS Tuning & Regression Techniques:*** *Advanced Methods for Tuning EOS Parameters to Improve Model Accuracy Using Regression Techniques*
0930 – 0945	*Break*
0945 – 1100	***Mixing Rules & Fluid Characterization:*** *Mixing Rules in EOS Models & their Application to Multi-Component Hydrocarbon Systems*
1100 – 1215	***Volume Translation & Density Calculations:*** *Techniques for Volume Translation & Accurate Density Calculations Using EOS Models*
1215 – 1230	*Break*
1230 – 1330	***Visualizing Phase Behavior with EOS:*** *Using EOS Models to Visualize Phase Behavior & Construct Phase Diagrams for Reservoir Fluids*
1330 – 1420	***Case Studies on EOS Model Applications:*** *Discussion of Case Studies Illustrating the Application of EOS Models in Reservoir Simulation & EOR Projects*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***PVT Analysis in Reservoir Simulation:*** *Importance of Accurate PVT Data in Reservoir Simulation Models & Impact on Simulation Outcomes*
0830 – 0930	***Role of PVT in Well Test Analysis:*** *Application of PVT Data in Interpreting Well Test Results & Reservoir Properties*
0930 – 0945	*Break*

0945 – 1100	***PVT Considerations in Enhanced Oil Recovery (EOR):*** *Examining the Role of PVT Analysis in Designing & Optimizing EOR Projects*
1100 – 1215	***Gas Injection & Miscibility Studies:*** *Using PVT Analysis to Evaluate Gas Injection Strategies & Miscibility Conditions for EOR*
1215 – 1230	*Break*
1230 – 1330	***Reservoir Fluid Grading & Compositional Gradients:*** *Analysis of Compositional Gradients & Reservoir Fluid Grading Using PVT Data*
1330 – 1420	***Workshop on PVT Data Interpretation:*** *Workshop Focused on Interpreting PVT Data for Reservoir & Production Engineering Applications*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

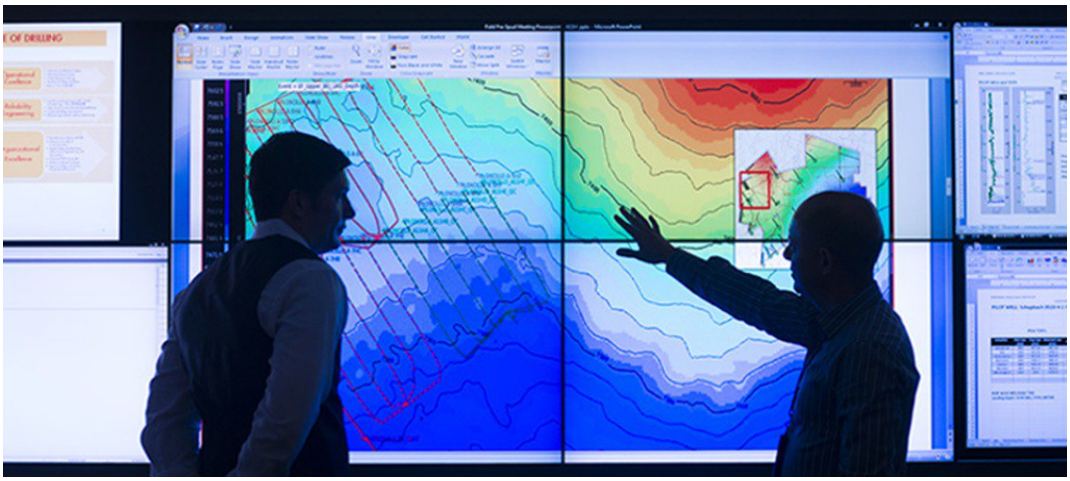
0730 – 0830	***Asphaltene Precipitation & Wax Formation:*** *Study of Asphaltene & Wax Precipitation Phenomena & their Impact on Reservoir & Production Operations*
0830 – 0930	***PVT Modeling of Complex Fluids:*** *Advanced Techniques for Modeling Complex Fluids, including Heavy Oils & Gas Condensates*
0930 – 0945	*Break*
0945 – 1100	***Thermodynamic Models for Hydrate Formation:*** *The Thermodynamics of Hydrate Formation & its Significance in Flow Assurance*
1100 – 1215	***EOS for Unconventional Reservoirs:*** *Adapting EOS Models for Unconventional Reservoirs, including Shale Gas & Tight Oil Formations*
1215 – 1230	*Break*
1230 – 1330	***Software Tools for PVT & EOS Analysis:*** *Overview of Software Tools & Packages Used for PVT Analysis & EOS Modeling in the Industry*
1330 – 1420	***Challenges & Future Directions in PVT & EOS:*** *Discussion on Current Challenges & Future Research Directions in PVT Analysis & EOS Characterization*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

0730 – 0830	***PVT & EOS in Field Development Planning:*** *Application of PVT & EOS Data in Field Development Planning & Decision-Making Processes*
0830 – 0930	***Integrating PVT Data with Reservoir Management Strategies:*** *Strategies for Integrating PVT Data into Comprehensive Reservoir Management Plans*
0930 – 0945	*Break*
0945 – 1100	***Impact of PVT Analysis on Production Forecasting:*** *Exploring the Impact of PVT Properties on Production Forecasting & Reserve Estimation*
1100 – 1230	***PVT Analysis for Asset Evaluation & Acquisition:*** *Utilizing PVT Analysis in the Evaluation & Acquisition of Oil & Gas Assets*
1230 – 1245	*Break*
1245 – 1345	***Case Studies on Advanced PVT & EOS Applications:*** *Review of Detailed Case Studies Showcasing Advanced Applications of PVT & EOS in Reservoir Engineering*
1345 – 1400	***Course Conclusion***
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-



Course Coordinator

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