COURSE OVERVIEW DE0171-4D
PTA/RTA Foundation

Course Title
PTA/RTA Foundation

Course Date/Venue
November 25-28, 2024/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference
DE0171-4D

Course Duration/Credits
Four days/2.4 CEUs/2.4 PDHs

Course Description

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

This course is designed to provide participants with a basic and up-to-date overview of pressure transient analysis/rate transient analysis (PTA/RTA). It covers the basic theory of diffusion PTA/RTA; the basic principles and terminology governing both methods; the Darcy's law and the equation of state leading to the diffusivity equation; the principle of superposition, infinite-acting radial flow, wellbore storage and skin and pseudo-steady state; the PTA methodology from the simple straight line horner to the current model-on-the-fly bourdet derivative; the quality control process before making an analysis; and the basic Saphir features including the interpretation path of load, edit, synchronizing, model, classical methods, derivative and the application to field examples.

Further, the course will also discuss the well models comprising of vertical wells, skin, finite/infinite conductivity fractures, limited entry and horizontal wells; the reservoir models covering homogenous and heterogeneous models behavior including 2Φ, 2κ and composite; the boundary models that include single limit, intersecting, parallel faults and closed system; and the typical errors encountered when diagnosing a boundary effect with an illustration of superposition effects and the influence of production duration on the analysis.

During this interactive course, participants will learn the use of pseudo pressures and multiple period analysis for rate dependant skin; the IPR AOF options in Saphir and the connection to the amethyste WPA module; the test objectives and designing a test to achieve them; the methodology from the basic empirical methods including Arps and Fetkovich to the current modern Blasingame, material balance and loglog diagnostic plots; the basic Topaze features including the interpretation path of load, edit, model, p(q), q(p), fast model and application to field examples; the principle of the linear (single phase) numerical model and how to build a model; and the well type, composite zones, faults and thickness.

Course Objectives

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

- Apply and gain a basic knowledge on pressure transient analysis/rate transient analysis (PTA/RTA)
- Discuss the basic theory of diffusion PTA/RTA as well as the basic principles and terminology governing both methods
- Describe Darcy's law and the equation of state leading to the diffusivity equation
- Explain the principle of superposition, infinite-acting radial flow, wellbore storage and skin and pseudo-steady state
- Carryout PTA methodology from the simple straight line horner to the current model-on-the-fly bourdet derivative
- Apply quality control process before making an analysis as well as discuss the basic Saphir features including the interpretation path of load, edit, synchronizing, model, classical methods, the derivative and the application to field examples
- Identify well models comprising of vertical wells, skin, finite/infinite conductivity fractures, limited entry and horizontal wells
- Describe reservoir models covering homogenous and heterogeneous models behavior including 2Φ, 2κ and composite
- Recognize boundary models that include single limit, intersecting, parallel faults and closed system
- Determine the typical errors encountered when diagnosing a boundary effect with an illustration of superposition effects and the influence of production duration on the analysis
- Use pseudopressures and multiple period analysis for rate dependant skin
- Explain the IPR AOF options in Saphir and the connection to the amethyste WPA module
- Discuss test objectives and design a test to achieve them
- Apply methodology from the basic empirical methods including Arps and Fetkovich to the current modern Blasingame, material balance and loglog diagnostic plots
- Recognize the basic Topaze features including the interpretation path of load, edit, model, p(q), q(p), fast model and application to field examples
- Discuss the principle of the linear (single phase) numerical model and how to build a model
- Define the well type and identify composite zones, faults and thickness

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, sample video clips of the instructor's actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides a basic and up-to-date overview of pressure/rate transient analysis for production engineers, reservoir engineers, production, operations, petroleum and reservoir engineers, geologists, analysts field personnel, senior and field supervisors with an engineering background and analysts involved with the design, supervision and interpretation of well tests who need to obtain a better understanding of the advanced practices used in pressure transient tests and its advanced interpretation models.

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$ 6,750 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: -

- 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 **2.4 CEUs** (Continuing Education Units) or **24 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.

- 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.

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:

Dr. Saad Aljzwe, PhD, MEng, MSc, BSc, is a **Senior Petroleum & Reservoir Engineer** with over **25 years** of practical and academic experience in the areas of **Petroleum Economic** Analysis, **Economic** Evaluation, **Petroleum Risk** Analysis & Decision Making, **Oil Agreement**, **Exploration & Production** Sharing Agreements, Multidisciplinary Research, Economics & Property Evaluation, Conventional & Unconventional **Oil & Gas Reserves** Estimation, **Reservoir** Management, **Reservoir** Engineering, **Reservoir** Performance Analysis, **Oil Fields Subsurface** Assessment & Forecasting, **Casing** Design, **Drilling & Workover**, **PVT & Core** Analysis, **Production** Operations, **EOR/IOR**, **Field Development** Design & Evaluation, Miscible Gas Injection (**CO2 Injection**) Design & Evaluation, **Special Core Analysis** & Formation Evaluation, **EOR-CO2 Injection**, **Remaining Gas** in Place Estimation, **Material Balance** Method, **Computerized Monitoring & Processing** System Design, **Magnetic Field** Controlling, Comparative **Risk Evaluation & Sensitivity** Analysis, Critical Production Rate for Bottom Water Coning in the Majed (EE-Pool) **Reservoir**, Oil Pipeline **Black Powder Removal**, **Oil Field Water Shutoff Treatment** Methods, **Water-Based Mud Rheological & Fluid Loss Control**, **Empirical Equation**, **Water-Flooding** Performance, **Sandstone Reservoirs**, **Reservoir Fluid** Properties, **Mathematical** Modelling, **Directional Permeability Anisotropy**, **Drilling** Operational Efficiency & Well Cost Reduction, Infill Drilling Program, **Drilling** Efficiency and **Ultra-mud System** Optimization. Further, he is also well-versed in various petroleum software such as the **MBAL** (Reservoir Engineering Toolkit), **KAPPA-Saphir** (Well Testing), **KAPPA-Rubis** (Reservoir Simulation), **CMG** (Reservoir Simulation), **Merak Peep** (Economic Evaluation and Production Decline Analysis) and **Monte Carlo** Simulation.

During Dr. Saad's career, he gained his thorough practical experience through several challenging positions such as the **Senior Lecturer**, **Head** of Petroleum Engineering Department, **Head** of Chemical Engineering Department, **Head** of the Union of Faculty Members, **Assistant Professor**, **Teaching Assistant**, **Researcher** and **Academic Coordinator** from various international well-renowned companies such as the **University of Wyoming**, **Colorado School of Mines**, **American University of Ras Al Khaimah**, **Australian College of Kuwait**, Sirt University and Bright Star University of Technology.

Dr. Saad has a **PhD** and **Master** degree in **Petroleum Engineering** from the **University of Wyoming** and **Colorado School of Mines**, **USA**, respectively as well as **Master** degrees in **Petroleum Economics & Management** and **Reservoir Geosciences & Engineering** from the **Instituit Francias du Petrole**, France and a **Bachelor** degree in **Petroleum Engineering**. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**) and a member of the American Society of Petroleum Engineering (**SPE**), Society of Petroleum Resources Economists (**SPRE**), Association of Professional Engineering of Libya, Libyan Society of Earth Science and the Environment Friends Association of Libya. Moreover, he is an **author/co-author** and published **various research papers** in local and international scientific journals and conferences. He has further delivered numerous trainings, courses, workshops, seminars and conferences globally.

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: ***Monday, 25th of November 2024***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 1030	***Introduction to PTA & RTA*** *When do we Perform PTA or RTA?*
1030 – 1045	*Break*
1045 – 1200	***Basic Theory of Diffusion PTA/RTA*** *The Basic Principles & Terminology Governing both Methods ● Introduction to Darcy's Law & the Equation of State Leading to the Diffusivity Equation*
1200 – 1300	***Basic Theory of Diffusion PTA/RTA (cont'd)*** *The Principle of Superposition, Infinite-Acting Radial Flow, Wellbore Storage & Skin & Pseudo-Steady State*
1300 – 1315	*Break*
1315 - 1420	***PTA Methodology*** *Methodology from the Simple Straight Line Horner to the Current Model-on-the-fly Bourdet Derivative*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2: ***Tuesday, 26th of November 2024***

0730 – 0930	***QA/QC*** *The Quality Control Process before Making an Analysis*
0930 – 0945	*Break*
0945 – 1130	***Saphir Practical*** *The Basic Saphir Features including the Interpretation Path of Load ● Edit ● Synchronizing ● Model ● Classical Methods ● The Derivative ● The Application to Field Examples*
1130 – 1230	***Well Models*** *Vertical Wells ● Skin ● Finite/Infinite Conductivity Fractures ● Limited Entry ● Horizontal Wells*
1230 – 1245	*Break*
1245 - 1420	***Reservoir Models*** *Homogenous & Heterogeneous Models Behavior Including 2Φ, 2κ & Composite*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3: ***Wednesday, 27th of November 2024***

0730 – 0930	***Boundary Models*** *Single Limit, Intersecting, Parallel Faults & Closed System ● Typical Errors Encountered when Diagnosing a Boundary Effect with an Illustration of Superposition Effects ● The Influence of Production Duration on the Analysis*
0930 – 0945	*Break*
0945 – 1130	***Basic Gas Tests*** *The Use of Pseudopressures & Multiple Period Analysis for Rate Dependant Skin Includes an Isochronal Test Example*

1130 – 1230	***IPR AOF*** *The IPR AOF Options in Saphir & the Connection to the Amethyste WPA Module*
1230 – 1245	*Break*
1245 - 1420	***Test Design*** *Test Objectives & How to Design a Test to Achieve Them*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4: ***Thursday, 28th of November 2024***

0730 – 0930	***RTA Methodology*** *Methodology from the Basic Empirical Methods including Arps & Fetkovich to the Current Modern Blasingame ● Material Balance & Loglog Diagnostic Plots*
0930 – 0945	*Break*
0945 – 1130	***Topaze Practical*** *The Basic Topaze Features including the Interpretation Path of Load ● Edit ● Model ● p(q) ● q(p) ● Fast Model ● Application to Field Examples*
1130 – 1230	***Basic Numerical PTA/RTA*** *The Principle of the Linear (Single Phase) Numerical Model ● How to Build a Model ● Defining the Well Type ● Composite Zones ● Faults & Thickness*
1230 – 1245	*Break*
1245 - 1345	***An Introduction to Advanced Features***
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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