

## **Well Construction Engineering (Two Weeks Course)**

*A practical Course for the Drilling Team to Plan,  
Execute, and Deliver Cost Effective Wells*

### **Instructors:**

Dr. Saleh, Drill-Sense International  
Dr. Hussain Rabia, EPL

### **Course Perspective**

This course draws from the experience and strengths of several instructors to deliver a unique course to the drilling professionals. The course is focused on engineering aspects of well construction from the planning stage to well completion. This course is essentially a recap of engineering analysis tools and methods needed by the drilling professionals (operation and engineers) to plan and execute the well construction focusing on safety and sound best practices. The topics discussed in the course include planning wells with predictive methods of drilling windows, casing design, and followed by real time well constructions and addressing issues related to drilling problems (losses, well control, stuck pipe).

### **Objectives**

1. Deliver the industry current best practices in tools, operating practices, and methodologies in pre drill well planning for drilling window, casing design, and mud selection
2. Focus on real time drilling diagnostics and best practices to model and validate pre drill models for pore pressure, wellbore stresses and stability, mud hydraulics, and hole cleaning
3. Address hole problems and best practices for remediation.

### **Who should attend?**

Anyone who is connected with well construction from the planning phase to post mortem including drillers, toolpushers, drilling engineers, geologists, crew members, and service personnel.

### **Course Materials**

The course will be delivered using a well established 1200 pages manual written by Dr. Rabia. This text book in drilling well construction is a benchmark used for over a decade to train drilling professional globally. In addition, power point presentations will be provided to complement the excellent course text book to cover new topics and class case studies.

### **Instructor:**

- Dr. Saad Saleh, Drill-Sense International (Vita Attached)
- Dr. Hussain Rabia, EPL
- Possibly other instructors in certain key areas such as technical limits, drill string, solids control, extra.

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## Course Content:

1. Basic geology
2. Pre drill pore pressure prediction
3. Pre drill drilling window prediction
4. Pre drill casing design and setting depths
5. Kick tolerance
6. Cementing operation and best practices
7. Liner cementation
8. Remedial cementation
9. Drill bits selection guidelines
10. Drill bits design
11. Drill bit performance indicators
12. Drilling Mechanics
13. Drill string functions, components, and selection
14. Bottom hole assemblies design and selection
15. Drill string design
16. Drill string dynamics (vibration detection, resolution, and management)
17. Drill string failure analysis
18. Torque and drag analysis
19. Drilling fluids selection
20. Drilling fluid trouble shooting
21. Stuck pipe mechanisms and best practices to prevent them
22. Shale problems
23. Fishing operations (free point, backing off, fishing tools, milling tools, economic time to fish)
24. Horizontal and extended reach wells (wellbore stability, torque and drag calculations, well profile design)
25. Multi laterals wells (planning consideration, junction design, well control issues, cementation)
26. High Pressure High Temperature wells (rig selection, mud selection, breathing problems, casing design, temperature effect on casing strength, others)
27. Well costing (drilling time estimate, NPT, risks)
28. Real time drilling analysis
29. Real time drilling window (caving analysis, mud weight calculation, effect of mud and chemistry on wellbore stability)
30. Technical limit drilling
31. Contracting strategies

## The Instructors:

### Dr. Hussain Rabia

Dr. Rabia is a well known drilling expert with world wide expertise in different areas in the drilling technology. D. Rabia is best known for his expertise in casing design, hydraulics, and well construction Engineering in which he published renowned books. These books were used extensively in his training worldwide. Dr. Rabia carry with him vast drilling operation experience as a senior drilling engineer with ADNOC, Drilling Manager with British Gas, and drilling consultant based in London. In the past three years, Dr. Rabia has been fully engaged in the highly successful transformation of young engineers to excellent drilling hands at Aramco to address need for top level drilling engineers and rig supervisor.

Dr. Rabia brings to the class over 40 years of top notch drilling operation and managerial experience.

### Dr. Saad Saleh



**Saad T. Saleh, Ph.D.**

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Dr. Saleh holds a Ph.D. and MS degrees in Petroleum Engineering from the Colorado School of Mines. He has over 20 years of professional drilling experience in industry and 6 years in academia. Dr. Saleh is a specialist in real time geopressure, wellbore stability, and drilling analysis. Dr. Saleh is highly experienced in drilling technology frontiers (HPHT deepwater, sub salt drilling to name few) in many parts of the world including Latin America, Gulf Coast, North Sea, Canadian Shelf, and the Far East. Dr. Saleh has been involved in training and mentoring drilling engineers and drilling operation personnel on geopressures prediction, wellbore stability analysis, drilling fluid solids control, and drilling fluids optimization.

Currently, Dr. Saleh is the President of Drill-Sense International, a consulting firm which specializes in advancing real time drilling technologies, training in all aspects of Petroleum Engineering with emphasis on drilling training, as well as providing expert advice to the global



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drilling industry on drilling diagnostics, optimization, well planning, and real time drilling surveillance.

Dr. Saleh was a Senior Drilling Fluid Specialist with Saudi Aramco (from 2005 to 2007), a Principal Geopressure advisor for Knowledge Systems (6 years from 2000 to 2005) in Houston, Texas, a Drilling Advisor for PDVSA-Intevep (3.5 years from 1997 to 2000), Assistant Professor at the Colorado School of Mines (4 years from 1994 to 1997) and the University of Alaska (2 years from 1988 to 1990), and a Drilling Engineer for BP Exploration in Alaska (4 years from 1990 to 1994) and Northern Petroleum (2 years from 1977 to 1979).