Advanced Offshore and Subsea Engineering Operations Training Course

16 - 20 Nov 2026

Cape town

4600 € (Per Person)

Ref: #OG9771_274607

Course Introduction / Overview:

The offshore and subsea engineering sector represents the pinnacle of human ingenuity, operating in some of the most challenging and unforgiving environments on Earth. This specialized field demands a deep and integrated understanding of marine hydrodynamics, subsea production systems, and robust asset integrity management. This course is meticulously designed to provide a comprehensive exploration of the entire lifecycle of offshore projects, from initial deepwater exploration and field development to production and eventual decommissioning. As highlighted by industry experts like Yong Bai in his seminal work, "Subsea Engineering Handbook," success in this domain hinges on a multidisciplinary approach that combines theoretical knowledge with practical application. BIG BEN Training Center has developed this program to bridge that gap, offering participants critical insights into subsea hardware, SURF design, and advanced intervention techniques. This training course moves beyond foundational concepts to tackle complex operational challenges, risk assessment, and the emerging trends shaping the future of offshore energy, ensuring delegates are prepared for the technical and logistical demands of modern subsea engineering.

Target Audience / This training course is suitable for:

- Offshore Project Managers.
- Subsea Engineers.
- Marine and Structural Engineers.
- Pipeline and Riser Design Engineers.
- ROV Pilots and Supervisors.
- Offshore Installation Managers.
- Well Intervention Engineers.
- Asset Integrity and Maintenance Planners.
- Technical and Engineering Consultants.
- Operations and Production Supervisors.
- Health, Safety, and Environment (HSE) Advisors.

Target Sectors and Industries:

- Oil and Gas Exploration and Production.
- Offshore Renewable Energy (Wind, Tidal, and Wave).
- Marine and Subsea Construction.
- Naval Architecture and Shipbuilding.
- Subsea Equipment Manufacturing and Supply.
- Engineering, Procurement, and Construction (EPC) Contractors.
- Governmental and Regulatory Bodies overseeing maritime and energy sectors.
- Marine Survey and Geotechnical Services.

Target Organizations Departments:

- Engineering and Design.
- Operations and Production.
- Project Management.
- Subsea and Marine Technology.
- Health, Safety, and Environment (HSE).
- Asset Integrity and Maintenance.
- Research and Development (R&D).
- Contracts and Procurement.
- Quality Assurance and Control (QA/QC).

Course Offerings:

By the end of this course, the participants will have able to:

- Analyze the complete lifecycle of an offshore field from development to decommissioning.
- Master the principles of subsea production systems, including wellheads, trees, and manifolds.
- Evaluate the design and installation challenges of subsea pipelines, risers, and umbilical's.
- Develop robust strategies for offshore asset integrity and risk-based inspection.
- Understand the operational capabilities and limitations of Remotely Operated Vehicles (ROVs).
- Assess the complexities of deepwater exploration and floating production systems (FPSO).
- Implement effective offshore safety and environmental management protocols.
- Compare different well completion and intervention techniques for subsea applications.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be immersive, interactive, and directly applicable to the professional challenges faced in the offshore industry. We move beyond traditional lecture-based learning to foster a dynamic environment where participants actively engage with the material. The course is built upon a foundation of real-world case studies, analyzing both successful offshore projects and incidents to draw critical lessons in engineering design and operational management. Interactive sessions, facilitated group discussions, and team-based problem-solving exercises will challenge participants to apply theoretical concepts to practical scenarios, such as developing a subsea field layout or creating a risk mitigation plan. Our expert instructors provide continuous feedback and guide participants through complex simulations. This hands-on approach ensures that attendees not only grasp the technical principles of subsea engineering but also develop the critical thinking and decision-making skills necessary to excel in high-stakes offshore environments. The focus is on building practical competence and confidence.

Course Agenda (Course Units):

Unit One: Fundamentals of Offshore and Subsea Environments

- Introduction to the Offshore Industry and Global Energy Markets.
- The Marine Environment: Oceanography, Metocean Data, and Seabed Conditions.
- Key Terminology and Concepts in Subsea Engineering.
- Offshore Health, Safety, and Environmental (HSE) Regulations.
- Overview of Offshore Field Architecture and Development Phases.
- Introduction to Marine Hydrodynamics and Wave-Structure Interaction.
- Geotechnical Considerations for Subsea Foundations and Anchoring.

Unit Two: Subsea Production Systems and Hardware

- Subsea Wellheads, Christmas Trees, and Completion Systems.
- Manifolds, Pipeline End Terminations (PLETs), and Tie-in Systems.
- Subsea Control Systems: Hydraulic, Electrical, and Fiber Optic.
- SURF: Subsea Umbilical's, Risers, and Flowlines.
- Flow Assurance Challenges: Hydrates, Waxes, and Corrosion.
- Principles of Subsea Processing and Separation Technology.
- Materials Selection for Subsea and Harsh Environments.

Unit three: Offshore Structures and Pipeline Engineering

- Design of Fixed and Floating Offshore Platforms (Jackets, FPSOs, TLPs).
- Mooring Systems and Station Keeping for Floating Structures.
- Offshore Pipeline Design, Routing, and On-bottom Stability.
- Pipeline and Riser Installation Methods (S-lay, J-lay, Reel-lay).
- Riser Analysis and Vortex-Induced Vibration (VIV).
- Pipeline Integrity Management and Pigging Operations.
- Structural Integrity and Fatigue Analysis for Offshore Assets.

Unit Four: Subsea Operations, Installation, and Intervention

- Role of Remotely Operated Vehicles (ROVs) and Autonomous Underwater Vehicles (AUVs).
- Subsea Surveying, Positioning, and Metrology.
- Offshore Installation Vessels and Heavy Lift Operations.
- Inspection, Repair, and Maintenance (IRM) Strategies.
- Subsea Well Intervention: Light and Heavy Techniques.
- Diving Operations and Hyperbaric Systems.
- Logistics and Supply Chain Management for Offshore Campaigns.

Unit Five: Advanced Topics and Future Trends in Offshore Engineering

- Challenges and Technologies for Deepwater and Ultra-Deepwater Fields.
- Offshore Decommissioning: Planning, Execution, and Regulations.
- The Role of Offshore Engineering in Renewable Energy (Offshore Wind Farms).
- Digitalization in Offshore Operations: Digital Twins and Data Analytics.
- Subsea Power Systems and Electrification.
- Innovations in Subsea Robotics and Remote Intervention.
- Managing Project Risks and Interfaces in Complex Offshore Projects.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

As offshore operations move into deeper and more hostile environments, how might the principles of biomimicry influence the next generation of subsea robotics and autonomous systems?

What unique qualities does this course offer compared to other courses?

This training course distinguishes itself through its holistic and lifecycle-oriented perspective on offshore and subsea engineering. While many programs focus narrowly on specific hardware or operational phases, this course provides a comprehensive A-to-Z journey, from initial geological assessment and field development planning through to late-life asset management and final decommissioning. This integrated approach ensures participants understand the critical interdependencies between different engineering disciplines and project stages. Furthermore, the curriculum places a significant emphasis on proactive risk management and flow assurance, treating them not as isolated topics but as core principles that must be embedded in every design and operational decision. The content is forward-looking, dedicating substantial time to emerging technologies such as subsea processing, digitalization, and the application of offshore engineering principles to the renewable energy sector. By focusing on the "why" behind the engineering choices and fostering critical thinking through complex case studies, the course equips professionals with the strategic insight needed to innovate and lead, rather than merely executing established procedures.