Training Course on Remote Operations and Autonomous Systems in Oil and Gas

Professional Development Training Course Outline

Category	Oil and Gas	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

In the rapidly evolving oil & gas (O&G) sector, the integration of remote operations, automation, and autonomous systems is reshaping operational workflows, reducing risk, and enhancing productivity. As energy demands rise and safety regulations tighten, O&G companies are under pressure to adopt intelligent automation, IoT, AI-driven robotics, and remote monitoring technologies. This transformation not only optimizes cost-efficiency but also minimizes human exposure in high-risk environments. Training Course on Remote Operations & Autonomous Systems in Oil & Gas (O&G) is designed to empower professionals with the technical knowledge, practical skills, and strategic insights to drive remote and autonomous operations in upstream, midstream, and downstream O&G segments.

This course delves into cutting-edge solutions including digital twins, drone surveillance, autonomous drilling, remote asset management, AI-based predictive maintenance, and real-time SCADA systems. Learners will explore industry-relevant case studies, simulate real-world challenges, and acquire actionable skills through immersive modules. With a strong focus on cybersecurity, HSE integration, and sustainability, this program prepares participants for the digital transformation sweeping across the energy sector. Whether you're an engineer, decision-maker, or IT professional, this course will elevate your capacity to innovate and lead in the smart O&G era.

Programme Curriculum

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Course Objectives

1. Understand the fundamentals of remote operations in O&G
2. Apply autonomous systems for upstream and downstream automation
3. Leverage AI, ML, and IoT in smart field operations
4. Utilize digital twins and simulation tools for planning and decision-making
5. Explore drone and robotic applications for remote surveillance and inspection
6. Design and implement predictive maintenance strategies using AI/ML
7. Strengthen cybersecurity protocols in autonomous O&G systems
8. Optimize remote asset management and field data acquisition
9. Integrate HSE (Health, Safety, and Environment) with remote systems
10. Analyze real-time SCADA and telemetry systems
11. Build awareness on regulatory frameworks and compliance
12. Improve operational uptime through remote troubleshooting and diagnostics
13. Gain insights from global case studies on successful autonomous deployment

Target Audiences

1. Operations & Process Engineers
2. Automation Engineers
3. HSE Managers & Safety Officers
4. IT & OT Professionals
5. Maintenance Supervisors
6. Project Managers in O&G
7. Energy Sector Consultants
8. Technology Vendors & Solution Architects

Course Duration: 10 days

Course Modules

Module 1: Introduction to Remote Operations in O&G

- Evolution of remote operations in the energy sector
- Key drivers for automation and remote control
- Industry standards and global trends
- Overview of remote operation centers (ROCs)
- Tools and platforms for monitoring & control
- **Case Study:** Chevron’s Remote Operations in the Permian Basin

Module 2: Autonomous Systems & Robotics

- Types of autonomous systems used in O&G
- Integration with existing infrastructure
- Autonomous underwater vehicles (AUVs) & drones

- Navigation, decision-making, and control
- Benefits and operational risks
- **Case Study:** BP’s autonomous robot inspection in deep-sea wells

Module 3: AI & Machine Learning in O&G

- Predictive analytics and pattern recognition
- Use of AI in anomaly detection
- Intelligent fault diagnosis systems
- Reinforcement learning in drilling automation
- Integration with SCADA & IoT
- **Case Study:** Shell’s ML platform for predictive equipment failure

Module 4: Remote Asset Management

- Remote diagnostics and troubleshooting
- Condition-based monitoring
- Digital asset tracking systems
- Integration with ERP systems
- Downtime reduction strategies
- **Case Study:** TotalEnergies’ offshore asset optimization program

Module 5: Digital Twin Technology

- What is a digital twin in O&G?
- Benefits in design, simulation, and operations
- Tools and platforms for digital twin development
- Real-time updates and analytics
- Lifecycle asset management
- **Case Study:** ExxonMobil’s refinery digital twin application

Module 6: Drone Technology & Aerial Surveillance

- Applications in flare inspection, pipeline monitoring
- Flight planning and remote operation
- Compliance and safety considerations
- Live feed and AI image processing
- Battery and payload management
- **Case Study:** Saudi Aramco’s drone fleet for aerial inspection

Module 7: SCADA Systems & Telemetry

- Basics of SCADA in O&G
- Telemetry for remote data acquisition
- Alarm systems and event detection
- Protocols and communication architectures
- Integration with cloud platforms
- **Case Study:** Statoil’s SCADA use in Norwegian offshore platforms

Module 8: Predictive Maintenance & Condition Monitoring

- Vibration, thermal, acoustic monitoring tools
- Data fusion from multiple sensors
- AI for failure prediction
- Maintenance planning and cost reduction
- Real-time equipment performance tracking

- **Case Study:** Halliburton’s predictive maintenance AI tool

Module 9: Cybersecurity for Remote Systems

- Cyber threats in industrial remote networks
- Secure OT-IT integration
- Zero-trust architecture for autonomous systems
- Real-time threat detection and response
- Compliance with NIST/IEC standards
- **Case Study:** Cyber attack prevention in Petrofac’s remote assets

Module 10: Human-Machine Collaboration

- Human role in automated environments
- Ergonomics and control interfaces
- Managing exceptions and overrides
- Operator training for remote systems
- Cognitive automation trends
- **Case Study:** Human-in-the-loop operation at Shell ROC

Module 11: Regulatory Compliance & Risk Management

- OSHA, ISO, and IEC standards in remote ops
- Risk assessment for automation deployment
- Permitting and legal implications
- Safety integrity levels (SIL)
- Documentation and audit trail maintenance
- **Case Study:** Equinor’s compliance framework for autonomous assets

Module 12: HSE Integration in Autonomous Systems

- Remote HSE monitoring technologies
- Alarm management and emergency response
- Air quality and gas leak monitoring systems
- AI for HSE compliance
- Worker safety in automated environments
- **Case Study:** HSE analytics at BP’s smart facilities

Module 13: Edge Computing & IoT Integration

- Edge computing for latency-sensitive apps
- IoT sensors in upstream and downstream
- Real-time processing and decision-making
- Cloud-edge collaboration
- Data security at the edge
- **Case Study:** Schlumberger’s IoT ecosystem for remote ops

Module 14: Digital Transformation & Change Management

- Change readiness and stakeholder alignment
- Process reengineering for automation
- Workforce reskilling strategies
- Leadership in tech adoption
- KPI development and ROI measurement
- **Case Study:** TotalEnergies’ company-wide automation strategy

Module 15: Future of Remote & Autonomous Systems in O&G

- Next-gen technologies (5G, quantum, AIoT)
- Self-healing systems and smart maintenance
- Cross-sector innovation (Aerospace to Energy)
- Ethical and workforce implications
- Investment trends and market outlook
- **Case Study:** Global energy transition and remote O&G operations by 2030

Training Methodology

- Instructor-led virtual and in-person sessions
- Hands-on labs and simulations
- Real-world case studies & practical demos
- Interactive quizzes and group activities
- Role-play and scenario-based learning
- Certification assessment at course end

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

Ready to enroll or request a customized program? Book online or contact us:

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