Training Course on Gas to Liquids (GTL) Technology and Economics

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

The global energy landscape is rapidly evolving, with cleaner fuel alternatives becoming critical for sustainability and environmental compliance. Gas to Liquids (GTL) technology has emerged as a transformative solution in converting natural gas into high-quality liquid fuels such as diesel, naphtha, and lubricants. Training Course on Gas to Liquids (GTL) Technology & Economics is designed to provide comprehensive technical and economic insights into GTL processes, covering Fischer-Tropsch synthesis, plant design, market dynamics, cost structures, and commercialization pathways.

With an increasing focus on low-carbon energy, alternative fuels, and energy transition strategies, GTL stands as a pivotal bridge between abundant natural gas resources and liquid fuel demand. This hands-on training offers real-world case studies, process simulations, and expert analysis to help participants build competence in deploying and managing GTL projects in diverse industrial contexts.

Programme Curriculum

Training Course on Gas to Liquids (GTL) Technology & Economics

Introduction

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Course Objectives

Participants will gain a comprehensive understanding of:

1. Understanding core GTL process technologies and their global applications
2. Evaluating Fischer-Tropsch and methanol-to-gasoline (MTG) routes
3. Analyzing GTL plant components and engineering design frameworks
4. Assessing project economics, cost estimation, and investment analysis
5. Integrating GTL into decarbonization and energy transition strategies
6. Exploring GTL market trends, future projections, and demand shifts
7. Performing environmental impact assessments of GTL plants
8. Understanding syngas production, purification, and catalyst technologies
9. Managing risk and uncertainty in GTL project execution
10. Applying GTL in offshore, stranded gas, and flare gas utilization
11. Benchmarking leading GTL players like Shell, Sasol, and PetroSA
12. Conducting lifecycle assessments of GTL products and by-products
13. Enhancing strategic decision-making with GTL feasibility modeling

Target Audience

1. Chemical Engineers
2. Project Managers in Oil & Gas
3. Energy Economists
4. Business Development Executives
5. Environmental Analysts
6. Technology Consultants
7. Energy Policy Makers
8. Investment and Risk Analysts

Course Duration: 10 days

Course Modules

Module 1: Introduction to GTL Technology

- Overview of GTL processes
- History and evolution of GTL
- Global GTL capacity and key players
- Role in the energy value chain
- Technical advantages over crude refining
- **Case Study:** Shell Pearl GTL Plant – Qatar

Module 2: Syngas Production & Reforming Technologies

- Natural gas reforming (SMR, ATR, POX)
- Steam-to-carbon ratios
- Catalyst selection and performance
- Process conditions and heat integration
- Syngas purification techniques
- **Case Study:** Sasol Synfuels Facility, South Africa

Module 3: Fischer-Tropsch Synthesis

- Reaction mechanisms
- Fixed-bed vs. slurry-phase reactors
- Catalyst deactivation and regeneration
- Product upgrading and refining
- Process efficiency and yield
- **Case Study:** Oryx GTL Plant in Ras Laffan

Module 4: Methanol-to-Gasoline (MTG) Route

- MTG vs. FT comparison
- Methanol synthesis from syngas
- Reaction kinetics
- Catalyst life cycle
- Process integration in GTL
- **Case Study:** ExxonMobil MTG Plant in New Zealand

Module 5: GTL Plant Design & Engineering

- Plant layout and footprint
- Equipment and instrumentation
- Utilities and offsite systems
- Process flow diagrams (PFDs)
- Modular construction benefits
- **Case Study:** Compact GTL's modular pilot in Brazil

Module 6: GTL Market Dynamics & Demand Forecast

- GTL product applications
- Regional and global demand trends
- Competitiveness vs. conventional fuels
- GTL pricing benchmarks
- GTL supply chain logistics
- **Case Study:** Shell GTL Base Oils Market Penetration

Module 7: Economic Evaluation of GTL Projects

- Capital and operating cost breakdown
- Cash flow modeling
- Sensitivity analysis
- ROI and payback calculations
- Financing models and subsidies
- **Case Study:** Economic Review of Chevron Sasol GTL JV

Module 8: Environmental & Sustainability Impacts

- Emission profiles vs. crude refining
- GHG accounting and CO? footprint
- Water use and wastewater treatment
- Solid waste and by-product management
- Role in net-zero strategies
- **Case Study:** Environmental Audit of Bintulu GTL Plant

Module 9: Catalyst Technologies for GTL

- Catalyst types and activity
- Lifetime and regeneration cycles

- Nano-catalysts and innovation
- Catalyst cost vs. performance
- Catalyst selection criteria
- **Case Study:** Haldor Topsoe Catalyst Deployment in GTL

Module 10: GTL in Flare Gas and Remote Gas Utilization

- Stranded gas challenges
- Flare gas recovery systems
- Micro-GTL units for remote sites
- Environmental compliance
- Mobile GTL technologies
- **Case Study:** Pilot GTL Application in Nigeria's Niger Delta

Module 11: Integration with LNG and Petrochemical Chains

- Synergies with LNG value chain
- Shared infrastructure strategies
- GTL-to-petrochemicals routes
- Co-location and resource optimization
- Cross-sector energy planning
- **Case Study:** GTL Integration with LNG in Malaysia

Module 12: Policy, Regulatory & Licensing Framework

- GTL project approval processes
- Environmental compliance
- Incentives and tax frameworks
- IP and licensing structures
- Trade regulations for GTL fuels
- **Case Study:** Policy Impact on GTL in the USA

Module 13: Digitalization in GTL Operations

- AI/ML in process optimization
- IoT for plant monitoring
- Digital twins and simulations
- Predictive maintenance
- Data-driven decision-making
- **Case Study:** Digital Transformation at Sasol GTL Units

Module 14: Risk Management & Project Execution

- GTL project risk identification
- Technical vs. commercial risks
- Risk mitigation strategies
- Project lifecycle planning
- Stakeholder engagement
- **Case Study:** Risk Lessons from the Escravos GTL Delays

Module 15: Future Outlook and Strategic Planning

- GTL in the hydrogen economy
- GTL vs. biofuels vs. e-fuels
- Technological breakthroughs
- GTL's role in global decarbonization

- Strategic partnerships and alliances
- **Case Study:** FutureScape GTL Roadmap by GlobalData

Training Methodology

- Interactive presentations by subject-matter experts
- Real-time case study evaluations
- Process flow and economic simulations
- Group activities and breakout sessions
- Access to proprietary GTL financial models
- Hands-on use of process modeling software

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
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000

Start Date	End Date	Location	Price
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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