Hydrogen Production Technologies Training Course

Professional Development Training Course Outline

Category	General Training	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

The global energy transition is accelerating demand for clean hydrogen production technologies, positioning hydrogen as a cornerstone of the decarbonization strategy, net-zero emissions roadmap, and the future of green energy systems. Hydrogen Production Technologies Training Course provides a comprehensive understanding of advanced hydrogen production pathways including green hydrogen, blue hydrogen, and grey hydrogen optimization technologies, aligned with global sustainability frameworks such as energy transition policies, carbon neutrality goals, and renewable energy integration systems. Participants will explore the entire hydrogen value chain from production to storage, transport, and end-use applications in mobility, industry, and power generation.

As industries shift toward low-carbon hydrogen economies, this course equips learners with cutting-edge knowledge in electrolyzer technologies, steam methane reforming, pyrolysis, gasification, and emerging photoelectrochemical hydrogen production methods. Emphasis is placed on industrial hydrogen applications, hydrogen fuel cells, renewable energy coupling, and hydrogen infrastructure development. By integrating real-world case studies and global best practices, the program enables participants to become proficient in designing, analyzing, and optimizing hydrogen production systems for scalable, efficient, and sustainable energy solutions.

Programme Curriculum

Hydrogen Production Technologies Training Course

Introduction

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5 days

Course Objectives

1. Understand hydrogen economy fundamentals and global energy transition trends
2. Analyze green hydrogen production via electrolysis technologies
3. Evaluate blue hydrogen systems with carbon capture and storage (CCS)
4. Explore grey hydrogen production and decarbonization pathways
5. Design electrolyzer-based hydrogen generation systems
6. Assess steam methane reforming (SMR) efficiency optimization techniques
7. Understand biomass gasification and renewable hydrogen pathways
8. Develop skills in hydrogen storage technologies
9. Study hydrogen transportation infrastructure and pipeline systems
10. Evaluate fuel cell technologies for mobility and power applications
11. Integrate renewable energy sources with hydrogen production systems
12. Apply life cycle assessment (LCA) for hydrogen sustainability analysis
13. Understand hydrogen safety standards, regulations, and industrial compliance

Target Audience

- Energy engineers and power system professionals
- Chemical and process engineers
- Renewable energy consultants
- Oil & gas industry professionals transitioning to hydrogen economy
- Government energy policy makers and regulators
- Research scientists and academic professionals
- Sustainability and ESG analysts
- Industrial plant managers and project developers

Course Modules

Module 1: Hydrogen Economy Fundamentals

- Global hydrogen demand trends and net-zero goals
- Hydrogen color classification

- Energy transition and decarbonization frameworks
- Hydrogen value chain overview
- Policy and regulatory landscape
- **Case Study:** EU Hydrogen Strategy and large-scale hydrogen deployment roadmap

Module 2: Electrolysis Technologies for Green Hydrogen

- PEM electrolysis systems
- Alkaline electrolysis fundamentals
- Solid oxide electrolysis (SOEC)
- Efficiency and energy consumption analysis
- Integration with solar and wind energy
- **Case Study:** Offshore wind-powered green hydrogen project

Module 3: Steam Methane Reforming (SMR) & Blue Hydrogen

- SMR process fundamentals
- Carbon capture, utilization, and storage (CCUS) integration
- Efficiency optimization techniques
- Emission reduction strategies
- Industrial hydrogen production scaling
- **Case Study:** Blue hydrogen production with CCS in large refinery operations

Module 4: Biomass Gasification & Renewable Hydrogen

- Thermochemical conversion processes
- Biomass feedstock selection
- Syngas cleaning and hydrogen extraction
- Catalytic enhancement methods
- Circular economy integration
- **Case Study:** Biomass-to-hydrogen pilot plant in Scandinavian energy systems

Module 5: Hydrogen Storage Technologies

- Compressed hydrogen storage systems
- Liquid hydrogen cryogenic storage
- Metal hydride storage solutions
- Safety engineering and pressure systems
- Storage efficiency and energy losses
- **Case Study:** Hydrogen storage systems in aerospace applications

Module 6: Hydrogen Transportation & Infrastructure

- Pipeline transport systems
- Hydrogen blending in natural gas grids
- Liquid hydrogen transport logistics
- Compression and distribution systems
- Infrastructure development challenges
- **Case Study:** Hydrogen blending project in national gas grid systems

Module 7: Fuel Cell Technologies & Applications

- Proton exchange membrane fuel cells
- Solid oxide fuel cells (SOFC)
- Mobility applications (FCEVs)
- Stationary power generation
- Efficiency and performance metrics
- **Case Study:** Hydrogen fuel cell buses deployment in urban transport systems

Module 8: Safety, Standards & Life Cycle Assessment

- Hydrogen safety protocols and hazard management
- International hydrogen standards
- Risk assessment and mitigation strategies
- Life cycle assessment (LCA) methodologies
- Environmental impact evaluation
- **Case Study:** Industrial hydrogen plant safety compliance and incident prevention system

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

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	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

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Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com