Circular Economy in Chemical Industries 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

Circular Economy in Chemical Industries training course is designed to equip professionals with cutting-edge knowledge and practical skills to transition from traditional linear production systems to sustainable, resource-efficient, and low-carbon circular models. As global industries face increasing pressure from climate change, regulatory compliance, and ESG (Environmental, Social, Governance) standards, the chemical sector is undergoing a transformative shift toward green chemistry, waste valorization, industrial symbiosis, and sustainable feedstock management. This course provides a comprehensive framework for understanding how chemical industries can redesign processes to minimize waste, reduce hazardous emissions, and maximize material recovery through circular strategies.

In today's rapidly evolving industrial landscape, organizations are adopting circular economy principles, life cycle assessment (LCA), carbon neutrality pathways, and digital sustainability tracking systems to remain competitive. This training bridges theory and practice by integrating real-world case studies, emerging technologies such as chemical recycling, bio-based materials, and advanced process intensification, and global best practices. Participants will gain actionable insights into how circularity can drive cost efficiency, regulatory compliance, innovation, and sustainable business growth while aligning with global frameworks such as the UN Sustainable Development Goals (SDGs) and net-zero targets.

Programme Curriculum

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Course Duration

5 days

Course Objectives

1. Master Circular Economy principles in chemical manufacturing systems
2. Understand Green Chemistry and sustainable process design
3. Apply Waste minimization and zero-liquid discharge strategies
4. Evaluate Life Cycle Assessment (LCA) in chemical production
5. Implement Industrial symbiosis in chemical clusters
6. Develop skills in Chemical recycling and upcycling technologies
7. Analyze Carbon footprint reduction techniques in chemical plants
8. Integrate Sustainable feedstock and bio-based alternatives
9. Explore Resource efficiency and energy optimization methods
10. Understand Regulatory frameworks and ESG compliance standards
11. Apply Process intensification for sustainable manufacturing
12. Leverage Digitalization and AI in circular chemical systems
13. Design Net-zero roadmap strategies for chemical industries

Target Audience

1. Chemical Engineers and Process Engineers
2. Sustainability and ESG Managers
3. Environmental Compliance Officers
4. Industrial Chemists and R&D Scientists
5. Manufacturing Plant Managers
6. Policy Makers in Environmental Regulation
7. Supply Chain and Operations Managers
8. Energy and Waste Management Consultants

Course Modules

Module 1: Fundamentals of Circular Economy in Chemicals

- Linear vs circular production models
- Core principles of circular economy

- Material flow analysis
- Value retention strategies
- Circular design thinking
- **Case Study:** BASF circular integration model in petrochemicals

Module 2: Green Chemistry & Sustainable Process Design

- Twelve principles of green chemistry
- Hazard reduction in chemical synthesis
- Safer solvents and catalysts
- Energy-efficient reactions
- Eco-design methodologies
- **Case Study:** Dow Chemicals' sustainable solvent substitution program

Module 3: Waste Valorization & Industrial Symbiosis

- Waste-to-resource conversion techniques
- By-product synergy in industrial clusters
- Circular waste exchange systems
- Zero waste manufacturing approaches
- Circular supply chain integration
- **Case Study:** Kalundborg Industrial Symbiosis Park (Denmark)

Module 4: Chemical Recycling & Advanced Material Recovery

- Mechanical vs chemical recycling
- Depolymerization technologies
- Polymer recovery systems
- Circular plastics economy
- Quality retention in recycled materials
- **Case Study:** Loop Industries PET chemical recycling system

Module 5: Life Cycle Assessment (LCA) & Carbon Accounting

- Cradle-to-cradle assessment methods
- Carbon footprint measurement tools
- Impact categories in LCA
- Data-driven sustainability reporting
- Environmental product declarations (EPDs)
- **Case Study:** SABIC carbon-neutral product portfolio assessment

Module 6: Bio-Based Feedstocks & Renewable Chemistry

- Bio-refineries and biomass conversion
- Green hydrogen in chemical processes
- Renewable feedstock substitution
- Enzyme-based catalysis
- Sustainable polymers and bioplastics
- **Case Study:** NatureWorks PLA biopolymer production system

Module 7: Digital Transformation in Circular Chemical Systems

- AI-driven process optimization
- IoT-enabled waste tracking
- Digital twins in chemical plants
- Predictive maintenance for sustainability
- Blockchain for material traceability
- **Case Study:** Siemens digital chemical plant optimization model

Module 8: Policy, ESG & Net-Zero Strategy Development

- Global chemical industry regulations
- ESG reporting frameworks
- Net-zero transition pathways
- Circular economy policy incentives
- Corporate sustainability strategy design
- **Case Study:** European Green Deal impact on chemical manufacturing sector

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

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

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