Green Chemistry and Sustainable Chemical Manufacturing Training Course



13 - 17 Dec 2026

Istanbul

4900 € (Per Person)

Ref: #ACE9768_214275

Course Introduction / Overview:

This training course gives a comprehensive look into the principles of green chemistry and their practical use in sustainable chemical manufacturing. The chemical industry is at a crossroads, with increasing pressure to reduce environmental impact, improve safety, and enhance resource efficiency. This course gives participants a solid foundation in the 12 principles of green chemistry, exploring how to design safer chemicals, reduce waste, and use renewable feedstock. We cover how to redesign chemical processes to be more efficient and less hazardous, from solvent selection to catalysis and reaction engineering. The curriculum is informed by leading academic research in the field. For instance, the principles discussed in the book Green Chemistry: Theory and Practice by Paul T. Anastas and John C. Warner serve as a foundational reference. BIG BEN Training Center is committed to giving a forward-thinking curriculum that equips professionals with the skills needed to innovate and create a more sustainable chemical industry for the future.

Target Audience / This training course is suitable for:

- Chemical and process engineers.
- R&D chemists and scientists.
- Environmental and sustainability managers.
- Quality assurance professionals.
- Product development specialists.
- Academics and students in chemistry and engineering.
- Regulatory affairs professionals.

Target Sectors and Industries:

- Chemical manufacturing.
- Pharmaceuticals.
- Consumer goods.
- Petroleum and petrochemicals.
- Plastics and polymers.
- Government agencies and environmental regulators.
- Biotechnology.

Target Organizations Departments:

- Research and development.
- Process engineering.
- Environmental, health, and safety.
- Sustainability and corporate responsibility.
- Quality control.
- Product innovation.
- Manufacturing and production.

Course Offerings:

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

- Describe the 12 principles of green chemistry.
- Design chemical syntheses to minimize waste.
- Select safer solvents and reagents for reactions.
- Use catalysis to improve reaction efficiency.
- Apply renewable feedstocks in industrial processes.
- Perform a life cycle assessment for chemical products.
- Optimize manufacturing processes for energy efficiency.
- Understand and apply green chemistry metrics.

Course Methodology:

This training course uses a mix of interactive and practical training methods to give dynamic learning experience. The curriculum combines theoretical lectures with real-world case studies to bridge the gap between academic concepts and practical application. Participants will use hands-on activities, including group workshops and scenario-based exercises, to reinforce their understanding of key topics. We use discussions and Q&A sessions to encourage a collaborative learning environment, where participants can share experiences and insights. The course also includes an in-depth analysis of successful and unsuccessful projects from various industries to highlight best practices and common pitfalls. This approach gives participants the confidence to apply their new knowledge directly to their professional roles. At BIG BEN Training Center, we believe that an engaging and interactive format is key to mastering new skills, so we focus on giving immediate feedback and continuous support throughout the training. The methods are designed to ensure every participant leaf with a clear, practical skill set.

Course Agenda (Course Units):

Unit One: Introduction to Green Chemistry.

- The history and context of green chemistry.
- The 12 principles of green chemistry.
- Metrics for assessing greenness.
- Life cycle assessment and sustainability.
- Case studies of green chemical processes.

Unit Two: Sustainable Feedstocks and Solvents.

- Using renewable feedstocks.
- Bio-based chemicals and products.
- Alternative and safer solvents.
- Solvent-free reactions.
- Supercritical fluids and ionic liquids.

Unit Three: Green Reaction and Catalysis.

- Atom economy and waste minimization.
- Green catalysis and biocatalysis.
- Flow chemistry and continuous processes.
- Microwave and ultrasound-assisted synthesis.
- Photocatalysis and its applications.

Unit Four: Safer Chemical Design.

- Designing safer chemicals.
- Risk assessment and toxicology.
- Hazard and risk reduction.
- Preventing chemical accidents.
- Regulatory frameworks and policies.

Unit Five: Industrial Implementation and Future Trends.

- Scaling up green processes.
- Economic analysis of green technologies.
- Case studies of industrial implementation.
- Green engineering principles.
- Future of sustainable chemical manufacturing.

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:

How can the integration of artificial intelligence and machine learning with green chemistry principles accelerate the discovery and optimization of new, environmentally friendly chemical processes?

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

This training course is unique because it goes beyond a theoretical overview of green chemistry to show you how to apply its principles in a real-world manufacturing environment. While many courses discuss the importance of sustainability, our curriculum is focused on practical tools and methods for making chemical processes safer and more efficient. We don't just teach you about the 12 principles; we help you find out how to use them to solve specific industrial problems, from designing new reactions to selecting the right solvents. The curriculum is heavily focused on real-world case studies that give clear examples of how companies have successfully gone green. It’s an advanced program that gives professionals the skills needed to lead innovation and drive sustainability in their organizations.