Industrial Enzyme Technology 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

Industrial Enzyme Technology is at the forefront of biotechnology innovation, green chemistry, and sustainable industrial processing, transforming how industries manufacture food, pharmaceuticals, textiles, detergents, biofuels, and paper products. Industrial Enzyme Technology Training Course provides a comprehensive understanding of enzyme engineering, biocatalysis, fermentation technology, downstream processing, and industrial-scale enzyme applications, equipping learners with the skills required to thrive in the rapidly expanding global bioeconomy. With increasing demand for eco-friendly bioprocessing, renewable resources, and cost-efficient manufacturing, enzyme technology has become a critical driver of industrial transformation.

This course is designed to bridge the gap between academic knowledge and real-world industrial applications by focusing on hands-on bioprocess design, enzyme production optimization, immobilization techniques, and industrial case-based problem solving. Participants will explore how modern industries leverage genetic engineering, recombinant DNA technology, metabolic engineering, and AI-driven bioprocess optimization to enhance enzyme performance. The program emphasizes practical insights from leading sectors such as food biotechnology, pharmaceutical manufacturing, biofuel production, and environmental bioremediation, ensuring learners gain job-ready, future-oriented competencies.

Programme Curriculum

Industrial Enzyme Technology Training Course

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Course Duration

5 days

Course Objectives

1. Understand fundamentals of industrial enzyme biotechnology and biocatalysis systems
2. Apply concepts of enzyme kinetics and reaction engineering in industrial processes
3. Analyze microbial fermentation technology for enzyme production
4. Design optimized bioreactors for large-scale enzyme manufacturing
5. Implement enzyme immobilization and stabilization techniques
6. Evaluate downstream processing and purification of industrial enzymes
7. Apply genetic engineering for recombinant enzyme production
8. Optimize processes using metabolic engineering and synthetic biology tools
9. Integrate enzymes in biofuel and renewable energy production systems
10. Assess enzyme applications in food processing and nutraceutical industries
11. Apply enzymes in detergent, textile, and paper industries for eco-efficiency
12. Use bioinformatics and AI tools for enzyme discovery and optimization
13. Develop industry-ready solutions for green chemistry and sustainable manufacturing

Target Audience

1. Biotechnology and biochemistry students
2. Industrial microbiologists and researchers
3. Chemical and process engineers
4. Pharmaceutical industry professionals
5. Food technology specialists
6. Environmental science practitioners
7. R&D professionals in bio-based industries
8. Entrepreneurs in biotech and green manufacturing

Course Modules

Module 1: Fundamentals of Industrial Enzyme Technology

- Enzyme classification and industrial relevance
- Biocatalysis principles and reaction mechanisms
- Enzyme structure-function relationship
- Industrial enzyme market trends

- Case Study: Use of amylase in starch processing industries

Module 2: Microbial Sources and Fermentation Technology

- Microbial strain selection for enzyme production
- Submerged vs solid-state fermentation
- Media optimization techniques
- Scale-up fermentation challenges
- Case Study: Aspergillus niger in citric acid and enzyme production

Module 3: Enzyme Kinetics and Bioreaction Engineering

- Michaelis-Menten kinetics in industrial systems
- Reactor design principles
- Mass transfer limitations
- Process optimization strategies
- Case Study: Protease enzyme in detergent formulation efficiency

Module 4: Genetic Engineering & Recombinant Enzymes

- DNA manipulation techniques
- Recombinant protein expression systems
- CRISPR-based enzyme enhancement
- Host-vector systems
- Case Study: Recombinant chymosin in cheese production

Module 5: Enzyme Immobilization Technology

- Physical and chemical immobilization methods
- Carrier materials and support systems
- Stability and reusability enhancement
- Industrial reactor integration
- Case Study: Immobilized lipase in biodiesel production

Module 6: Downstream Processing & Purification

- Filtration and centrifugation techniques
- Chromatography methods
- Enzyme recovery optimization
- Quality control and validation
- Case Study: Industrial-scale purification of cellulase for biofuel industry

Module 7: Industrial Applications of Enzymes

- Food and beverage processing
- Textile and leather industry applications
- Detergent and cleaning industries
- Pharmaceutical and medical applications
- Case Study: Lactase enzyme in lactose-free dairy production

Module 8: Emerging Trends & Sustainable Biotechnology

- AI and machine learning in enzyme discovery

- Synthetic biology applications
- Green chemistry integration
- Circular bioeconomy models
- Case Study: Enzyme-based plastic biodegradation

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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