Food Process Engineering Principles and Calculations Training Course

Professional Development Training Course Outline

Category	Food processing and Technology	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Food process engineering is a vital discipline in the modern food industry, combining scientific knowledge and engineering principles to improve production efficiency, enhance food safety, and optimize sustainability. Food Process Engineering Principles and Calculations Training Course on food process engineering principles and calculations provides participants with the analytical skills and technical knowledge required to design, operate, and troubleshoot food processing systems. With a focus on practical applications, this course integrates trending topics such as automation in food processing, energy efficiency, and process optimization to empower professionals in achieving high-quality outcomes.

By equipping participants with advanced skills in calculations and practical engineering methods, the course emphasizes critical aspects such as heat and mass transfer, fluid mechanics, food rheology, and equipment design. Attendees will gain hands-on exposure to essential tools, case studies, and emerging technologies shaping the future of food processing. This program aims to bridge the gap between theory and industrial application, supporting professionals to enhance food product quality, extend shelf-life, and reduce production costs while ensuring compliance with safety and regulatory standards.

Programme Curriculum

Food Process Engineering Principles and Calculations Training Course

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Course Objectives

1. Understand the fundamental principles of food process engineering.
2. Apply engineering calculations in real-life food processing scenarios.
3. Analyze heat transfer and mass transfer mechanisms in food operations.
4. Evaluate fluid flow and rheological properties of food systems.
5. Optimize process efficiency using modern food engineering tools.
6. Design and assess food processing equipment for industry applications.
7. Integrate sustainability and energy efficiency in food plant operations.
8. Enhance quality control through scientific engineering principles.
9. Perform process modeling and simulation for food systems.
10. Address food safety through hygienic engineering design.
11. Explore automation, robotics, and digital trends in food processing.
12. Apply troubleshooting and problem-solving methods in production.
13. Strengthen decision-making skills using applied case studies.

Organizational Benefits

- Improved operational efficiency in food manufacturing.
- Enhanced product quality and consumer satisfaction.
- Increased compliance with global food safety regulations.
- Reduced production costs through optimized processes.
- Better utilization of energy and sustainable resources.
- Strengthened innovation and competitive advantage.
- Reduced downtime and improved troubleshooting methods.
- Enhanced technical expertise within the workforce.
- Long-term business growth through efficient engineering.
- Stronger alignment with Industry 4.0 food processing trends.

Target Audiences

- Food process engineers
- Production managers
- Quality assurance specialists
- Plant supervisors
- Research and development professionals
- Food safety officers
- Industrial engineers
- Technical consultants

Course Duration: 5 days

Course Modules

Module 1: Fundamentals of Food Process Engineering

- Introduction to process engineering principles
- Role of engineering in food production systems
- Essential engineering terminologies and concepts
- Application of physics and chemistry in food processing
- Importance of accurate calculations in industrial practice
- Case study: Understanding milk pasteurization processes

Module 2: Food Rheology and Fluid Mechanics

- Properties of Newtonian and non-Newtonian fluids
- Measurement techniques for viscosity and texture
- Application of fluid mechanics in food transport systems
- Pump and piping design considerations
- Challenges in fluid food handling
- Case study: Flow properties in tomato paste processing

Module 3: Heat Transfer in Food Processing

- Principles of conduction, convection, and radiation
- Heat exchangers in food industry applications
- Thermal conductivity of various food products
- Role of heat transfer in sterilization and cooking
- Energy efficiency in heat treatment operations
- Case study: Heat transfer in canned food sterilization

Module 4: Mass Transfer Operations

- Principles of diffusion and evaporation in foods
- Importance of drying in food preservation
- Concentration processes for liquid foods
- Role of membranes in separation processes
- Advances in evaporation technology
- Case study: Spray drying in powdered milk production

Module 5: Food Freezing and Refrigeration

- Fundamentals of low-temperature preservation
- Design and operation of refrigeration systems
- Freezing curves and their significance
- Cold chain management in food logistics
- Energy challenges in refrigeration
- Case study: Frozen fish preservation techniques

Module 6: Food Dehydration Principles

- Importance of moisture removal in preservation

- Methods of food dehydration
- Equipment design for drying systems
- Quality implications of dehydration processes
- Advances in low-energy drying techniques
- Case study: Drying technology in fruit slices production

Module 7: Food Process Equipment Design

- Basic design principles of food machinery
- Mechanical aspects of food equipment
- Hygienic design for safety compliance
- Equipment sizing and scale-up principles
- Maintenance and operational challenges
- Case study: Equipment design in beverage processing

Module 8: Process Modeling and Simulation

- Role of computational modeling in food systems
- Tools and software used in food process simulation
- Predictive modeling for heat and mass transfer
- Simulation for process optimization
- Challenges in applying simulations in food industry
- Case study: Simulation of baking processes

Training Methodology

- Instructor-led interactive sessions
- Real-world case study discussions
- Practical exercises and calculations
- Group-based problem-solving activities
- Simulation and modeling software demonstrations
- Q&A and feedback sessions

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:

Register Online Now

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