Introduction to Food Chemistry and Reactions 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 chemistry is a crucial area in food science that explores the chemical composition, properties, and reactions of food components during processing, storage, and consumption. Introduction to Food Chemistry and Reactions Training Course provides an in-depth understanding of macronutrients, micronutrients, enzymes, and additives, as well as the chemical reactions that impact food quality, safety, and nutritional value. Participants will gain practical insights into how food chemistry is applied across the food industry, ensuring compliance with quality standards and consumer demands.

By integrating modern knowledge of biochemical pathways, food safety standards, and technological advancements, this course empowers learners to connect theory with real-world practices. With global attention on sustainable food production, quality assurance, and consumer health, mastering food chemistry and reactions has become essential. This training program equips learners with analytical tools, problem-solving strategies, and applied case studies that enhance both academic knowledge and industrial performance.

Programme Curriculum

Introduction to Food Chemistry and Reactions Training Course

Introduction

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Course Objectives

1. Understand the fundamentals of food chemistry and molecular interactions.
2. Analyze the chemical composition of carbohydrates, proteins, and lipids in food.
3. Explore enzymatic and non-enzymatic food reactions.
4. Evaluate the impact of food additives and preservatives on stability.
5. Study the Maillard reaction and caramelization in food processing.
6. Examine food pigments and flavor compounds.
7. Investigate the role of water activity in food preservation.
8. Assess the nutritional changes during food processing.
9. Apply spectroscopic and chromatographic methods for food analysis.
10. Identify food adulteration and authenticity testing methods.
11. Examine chemical hazards and food toxicology.
12. Understand the chemistry of fermentation and biotechnology in foods.
13. Develop skills to ensure food safety, sustainability, and innovation.

Organizational Benefits

- Enhanced product quality assurance through chemical analysis.
- Increased compliance with international food safety standards.
- Improved innovation in food product development.
- Strengthened ability to identify and reduce food adulteration.
- Enhanced efficiency in food preservation and shelf-life extension.
- Increased consumer trust through transparency in food chemistry practices.
- Stronger capability to minimize risks of food contamination.
- Optimized use of food additives for safe and effective processing.
- Improved competitiveness in the global food industry market.
- Integration of sustainability into food production and processing.

Target Audiences

1. Food technologists
2. Nutritionists and dietitians
3. Food quality assurance professionals
4. Food safety auditors
5. Biochemists and laboratory analysts
6. Food product developers
7. Academic researchers in food science
8. Regulatory and compliance officers

Course Duration: 5 days

Course Modules

Module 1: Introduction to Food Chemistry

- Definition and scope of food chemistry
- Importance in food industry and consumer health
- Major food components overview
- Chemical bonds and interactions in food molecules
- Case study: Role of chemistry in food safety management
- Practical exercises in molecular understanding

Module 2: Carbohydrates in Food

- Structure and classification of carbohydrates
- Functional properties in food processing
- Reactions of sugars during storage
- Sweeteners and their chemical behavior
- Case study: Caramelization in baked products
- Analytical testing of carbohydrate content

Module 3: Proteins in Food

- Structure and function of proteins
- Protein denaturation and coagulation
- Enzymatic modifications of proteins
- Protein-protein and protein-lipid interactions
- Case study: Protein reactions in dairy processing
- Laboratory analysis of protein quality

Module 4: Lipids in Food

- Structure and classification of lipids
- Lipid oxidation and rancidity
- Role in texture and flavor
- Emulsification and lipid-water interactions
- Case study: Lipid oxidation in fried foods
- Analytical techniques for lipid profiling

Module 5: Enzymes in Food Systems

- Classification and properties of enzymes
- Enzymatic browning in fruits and vegetables
- Role in food processing and biotechnology
- Enzyme inhibitors in food systems
- Case study: Enzymes in brewing and baking
- Practical enzyme activity experiments

Module 6: Food Additives and Preservatives

- Classification and functions of additives
- Chemical stability and reactivity of additives
- Regulations and safety evaluation
- Impact on flavor, color, and shelf-life
- Case study: Preservatives in packaged foods

- Analytical testing of food additives

Module 7: Food Pigments and Flavors

- Chemistry of natural and synthetic pigments
- Flavor compounds and their interactions
- Stability of pigments during processing
- Factors affecting flavor perception
- Case study: Pigment changes in vegetable canning
- Chromatographic analysis of flavors

Module 8: Food Reactions and Safety

- Maillard reaction and its implications
- Caramelization and food flavor enhancement
- Toxic compounds formed during reactions
- Role of water activity in reactions
- Case study: Maillard reaction in bread crust
- Safety evaluation of processed foods

Training Methodology

- Interactive lectures with real-life industrial examples
- Hands-on laboratory sessions for food analysis
- Group discussions and problem-solving exercises
- Case studies for applied learning
- Multimedia presentations for enhanced understanding
- Assessments through quizzes and project work

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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