Syllabus

B-Vocational

Food Technology

(6 Semester Programme)

Kumaun University Nainital

Food Technology

Semester wise Course allocation:

Semester	Course Content	
	Code	**Title**
Semester-I	FT 101	Fundamentals of Foods and Nutrition
	FT 102	Fundamentals of Entrepreneurship Development
	FT 103	Fundamentals of Food Microbiology
	FT 104	Basic Food Quality Analysis
Semester- II	FT 201	Fundamentals of Food Chemistry
	FT 202	Principles of Food Processing
	FT 203	Fruit & Vegetable Processing
	FT 204	Communication Skills
Semester- III	FT 301	Food Technology & Related Aspects
Semester- IV	FT 401	Food Processing and Sensory Evaluations
Semester- V	FT 501	Food Hygiene, Policy and Regulations
Semester- VI	FT 601	Industrial Specific Project Work (Viva-Voce examination**)**

Food Technology

SEMESTER 1st

Paper – I

Total Marks 70+30=100

FT 101: Fundamentals of Foods and Nutrition

Unit 1: Introduction to Foods and Nutrition

Unit 2: Nutritive Value of Foods

Unit 3: Energy Balance and body composition

Unit 4: Digestion, Absorption and Transport of Food

Unit 5: Dietary sources and physiological role of different nutrients: Covers minerals

Unit 6: Water

Unit 7: Food Fortification

Unit 8: Food Pyramid & Meal Planning

Unit 9: Nutrition during Life Cycle: Pregnancy, Lactation, and Infancy

Unit 10: Nutrition during Life Cycle: Children, Teenagers, and the Elderly

Unit 11: Dietary Guidelines

Unit 12: Nutritional Deficiency Disorders

Unit 13: Functional Foods and Nutraceuticals

Unit 14: Trends, Issues and Strategies in modern foods.

Food Technology
SEMESTER 1st
Paper – II

Total Marks 70+30=100

FT 102: Fundamentals of Entrepreneurship Development

Unit 1: Basic Concepts of Entrepreneurship
Unit 2: Qualities of an entrepreneur
Opportunity-seeking
Persevering
Risk Taking
Demanding for efficiency and quality
Information-seeking
Goat setting
Planning
Persuasion and networking
Building self-confidence
Listening to others
Demonstrating leadership
Unit 3: Generating a Business Idea
Unit 4: Developing a Business **Idea**
Unit 5: Market analysis
Unit 6: Financial analysis: Sources of finance, Government policies and supports
Unit 7: Realistic planning
Unit 8: Marketing
Unit 9: Costing and Pricing

Food Technology
SEMESTER 1st
Paper – III

Total Marks 70+30=100

FT 103: Fundamentals of Food Microbiology

Unit 1: Importance and significance of micro- organisms in food
Unit 2: Microbial spoilage of foods factors affecting kinds, numbers, growth and survival of microorganisms in foods; Intrinsic factors; pH,, water activity, nutrients etc., extrinsic factors: Relative humidity, temperature , gaseous atmosphere;
Unit 3: Chemical changes caused by microorganisms
Unit 4: Contamination of foods; Sources of contamination.
Unit 5: Microbiology of milk and milk products
Unit 6: Microbiology of fruits and vegetables
Unit 7: Microbiology of cereal and cereal products
Unit 8: Microbiology of meat and meat products
Unit 9: Microbiology of fish and other sea foods
Unit 10: Microbiology of poultry and eggs
Unit 11: Microbiology of sugar and sugar products
Unit 12: Microbiology of salts and spices
Unit 13: Microbiology of canned foods
Unit 14: Food Poisoning and Infection

Food Technology
SEMESTER 1st
Paper – IV

Total Marks 70+30=100

FT 104: Basic Food Quality Analysis

Unit 1: Concepts of food analysis
Unit 2: Sampling plan; Sample collection and preparation for analysis
Unit 3: Sensory evaluation of products;
Unit 4: Quality evaluation of raw materials: Fruits, vegetables, cereals, dairy products, meat poultry products;
Unit 5: Quality evaluation of food products for color and taste of marketed products
Unit 6: Determination of total soluble solids/brix
Unit 7: Determination of moisture, total soilds
Unit 8: Determination of total ash, acid insoluble ash.
Unit 9: Determination of titratable acidity, total sugars, reducing sugar, estimation of starch, salt etc.
Unit 10: Determination of proteins
Unit 11: Determination of total fatx
Unit 12: Determination of calorie by calculations
Unit 13: Microbiological examination of fresh and processed products, incubation test, mould count, yeast, bacteria spores, insects.

Food Technology

SEMESTER - 02

FT 201	Fundamentals of Food Chemistry
FT 202	Principles of Food Processing
FT 203	Fruit & Vegetable Processing
FT 204	Communication Skills

Food Technology

SEMESTER 2nd

Paper – I

Total Marks 70+30=100

FT 201: Fundamentals of Food Chemistry

Unit 1: Introduction to Food Chemistry
Unit 2: Water in Foods
Unit 3: Food Carbohydrates and Browning reaction
Unit 4: Food Lipids
Unit 5: Food amino acids
Unit 6: Food peptides and Proteins
Unit 7: Minerals
Unit 8: Vitamins
Unit 9: Pigments & Flavours
Unit 10: Food Enzymes
Unit 11: Food Toxins and Allergens
Unit 12: Chemistry of Plant Derived Foods
Unit 13: Chemistry of Animal Derived Foods
Unit 14: Food Additives and Contaminants

Food Technology
SEMESTER 2nd
Paper – II

Total Marks 70+30=100

FT 202- Principles of Food Processing

Unit 1: Sources of food. Scope ad benefit of industrial food preservation
Unit 2: Perishable and non-perishable food. Causes of food spoilage, Preservation by salt and sugar-principle, method, equipment and effect on food quality
Unit 3: Thermal processing methods of preservation- principle and equipment. Canning, blanching, pasteurization, sterilization and evaporation
Unit 4: Use of low temperature- principle, equipment and effect on quality, chilling, cold storage and freezing
Unit 5: Preservation by drying, dehydration and concentration- principle, equipment, methods and effect on quality. Physical and chemical changes in food during drying and dehydration, Intermediate moisture foods, concentrates- concepts and methods
Unit 6: Preservation by radiation, chemicals and preservatives – definitions, methods of irradiation, direct and indirect effect
Unit 7: Preservation by fermentation- definition, advantages, disadvantages, types and equipment
Unit 8: Microwave processing of foods
Unit 9: Modern methods of food preservation- pulsed electric field processing, high pressure processing, processing using ultrasound, dielectric, ohmic and infrared heating, ozone and carbon di oxide processing- theory, equipment and effect on food quality
Unit 10: Concepts of size reduction, size enlargement, mass balance etc.

Food Technology
SEMESTER 2nd
Paper – III

Total Marks 70+30=100

FT 203 - Fruits and Vegetable Processing

Unit 1: Importance of fruits and vegetables technology

Unit 2: Principles involved in preservation of fruits and vegetables products by

- Asepsis
- Thermal preservation
- Low temperature preservation
- Frozen preservation
- Fermentation and pickling
- Irradiation
- Chemical preservation
- Hurdle technology
- Packaging
- Non- thermal emerging technologies

Unit 3: Principles involved in processing of fruits and vegetables products

- Sorting grading, peeling etc.
- Extraction of pulp and juices
- Juice clarification

Unit 4: Specification of process fruits and vegetables products

- Jam, jelly, marmalade and chutney
- Ketchup and Chutney
- Beverages
- Canned products chutney
- Preserve and candy

Food Technology
SEMESTER 2nd
Paper – IV

Total Marks 70+30=100

FT 204 - Communication Skills

Unit 1:

Communication – An Overview
Importance of communication;
Nature of Communication: Process, Principles;
Barriers to Communication;

Unit 2:

Pronunciation
Organs of Speech and speech mechanism;
Speech Sounds: Classification-Vowels, Diphthongs, Consonants;
Phonetic Symbols: Accent, Intonation, Stress;

Unit 3:

Situational Dialogues
Social dialogues: greetings, goodbyes, personal information, respond to invitations, expressing gratitude, Instructions and Directions;
Work-place Descriptions: Basic office furniture and equipment, Work-place Layout;

Unit 4:

Effective Presentation
Audience awareness: analysing audience, analysing speaker, analysing context; Organising: Presentation plan, body language, voice modulation;
Visual Aids: Objects and Models, Photographs, Diagrams, Lists and Tables, Pie-charts, Bar and Column Charts, Pictograms, Graphs, Video;
Presentation Media: chalk and Marker Boards, flip charts and poster boards, transparencies and photographic slides, computer displays, video players, handouts, presentation software(PPTs); Guidelines for using Visual Aids: selection, design, presentation;

Unit 5:

Listening Skills
Importance of Listening;
Barriers to Effective listening: Physiological, Environmental, Attitudinal, Socio-cultural Differences, Lack of Training;
Guidelines to Effective Listening;

Unit 6:

Reading Skills
Importance of Reading;
Types of Reading;
Reading Comprehension Skills;

Unit 7:

Job Related Communication
Application Letter: Importance and Function, Structure, Drafting the Application, Preparing the Resume, Resignation Letter;
Employment Interview: Types of Interview- Information-gathering interview, career research interviews, employment interview, performance appraisal interview, Preparing for Interview.

Food Technology
SEMESTER – 03

FT 301: Food Technology and Related Aspects

Food Technology
SEMESTER 3rd

Total Marks 70+30=100

FT 301: Food Technology and Related Aspects

Unit 1:

-Introduction to Food Technology
-Harvesting of Food Products: It covers harvesting and maturity of Fruits and Vegetables
-Post-Harvest Handling: This unit covers post-harvest handling of Fruits and Vegetables
-General Principles of Food Preservation
-Food Preservation by Heat: Covers preservation by drying also
-Food Preservation by Low Temperature
-Food Preservation by Modified Atmosphere
-Food Preservation by using Chemicals: Covers preservation by food additiives
-Food Preservation by Radiation

Unit 2:

- Introduction to Dairy Technology: Covers composition and chemistry of milk, biosynthesis of milk
-Microbiology of Milk
-Milk collection, Transportation and Storage – Covers Utilities of Refrigeration
-Milk Processing – I: Clarification and Separation
-Milk Processing – II: Pasteurization: Covers Utilities of Steam
-Milk Processing – III: Homogenization and Fortification of Milk
-Milk Processing – IV: Membrane Processing
-Milk Processing – V: Evaporation and Drying of Milk
-Dairy products

Unit 3:

-Pests – An Introduction
-Pests in Food Premises – I: Insects: Covers Growth and Development of Insects, Insects Pests of Food Products, Storage Pest
-Pests in Food Premises II - Microbes
-Pests in Food Premises – III: Rodents- Covers Identification and Behavior and Control Measures
-Pests in Food Premises – IV: Birds
-Pest Control: Throws light on different pest control strategies: Physical, Chemical and Biological methods
-Pesticides, their Formulations and Nomenclature
-Integrated Pest Management in Food Premises

Unit 4:

-Introduction to Management
-Inventory
-Material Requirement planning
-Purchasing Management
-Stores
-Inventory Control and Cost Reduction Technique
-Material Handling
-Packaging and Distribution Management
-Preservation of Cereals and Pulses
-Logistics Management
-Introduction to Book Keeping -Assets, Liabilities and Owner's Equity
-Balance Sheet
-Financial Statements.

Food Technology
SEMESTER – 04

FT 401: Food Processing and Sensory Evaluation

Food Technology
SEMESTER 4th

Total Marks 70+30=100

FT 401: Food Processing and Sensory Evaluation

Unit 1:
-Introduction to Food Processing
-Post- Harvest Handling and Preparation of Food for Processing
-Baking, Extrusion and Frying
-An Over View of Process Control in Food Processing
-Process Control in Modern Food Processing
Unit2:
-An Over View of Baking and Brewing
-Bakery Ingredients and Their Uses
-Machines and Equipment Used in Batch and Continues production of Bakery Products -Testing Flour
-Manufacture of Cake and Biscuits
-Analysis of Bakery Products
Unit 3:
-Introduction to Food Evaluation
-Central Nervous System
-Physiological and Psychological Foundations of Sensory Evaluation
-General Laboratory Set-Up for Sensory Evaluation
-An Over View Sensory Analysis
-Tests of Sensory Evaluation
-Sensitivity Tests
Unit 4:
- Flavor Profile Evaluation System`
-Sensitivity Threshold Tests
-Sensory Evaluation Personnel
-Panel Screening
-Selection and Training
-Hazard Analysis and Critical Control Point

Food Technology
SEMESTER – 05

FT 501: Food Hygiene, Policy and Regulations

Food Technology
SEMESTER 5th

Total Marks 70+30=100

FT 501: Food Hygiene, Policy and Regulations

Unit 1:

-Introduction to Food Hygiene and Sanitation
-Food Contamination & Spoilage
-Purchasing and Receiving Safe Foods
-Sanitary Procedure in Preparing and Holding Food
-Serving and Displaying Food
-Special Food Operations
-Location and Layout Food Production Unit
-Cleaning Procedures
-Water Supply

Unit 2:

-Environmental Pollutions and Disposal of Food Industry Waste
-Personnel Hygiene
-Introduction to Food Packaging
-Packaging Materials
-Packaging Methods
-Storage Methods (CA, MA hypobaric storage, pre-cooling and cold storage, Zero energy cool chambers)
-Storage during Food Transportation

Unit 3:

-Food Biotechnology – An Overview
-Introduction to Food Quality, Food Policies and Regulations
-General Principles of Quality Control and Quality Assurance
-Responsibilities and Organization of the Quality Assurance Department
-Quality Management Systems
-Sampling and Inspection
-Recording and Reporting

Unit 4:

-Introduction to Food Policy
-Public Policy and Governance -Food Policies in India
-Food Policies Abroad
-Food Safety and Standards Act
-Regulatory Bodies and Their Responsibilities

Food Technology
SEMESTER – 06

FT 601: Industrial Specific Project Work
(Viva-Voce examination)

Food Technology
SEMESTER 6th

Total Marks 70+30=100

FT 601: Industrial Specific Project Work

1. Food Production equipment in Industry.
2. Food processing techniques.
3. Industrial safety and hazard.
4. Health, safety & Environment auditing.
5. Preservative/ Preservation used in industries.
6. Food safety and hazard Analysis.
7. Food Laws.
8. Food quality, Food Policies and regulations.
9. Environmental pollutions and disposal of food industry waste management.
10. Beverages and Non Beverages product development.
11. Food poisoning and food borne illness.
12. Food packaging and Analysis.
13. Specialization in food microbiology analysis, equipment & food micro organism.
14. Food analysis and sensory evolution.
15. Entrepreneurship of food processing.

Students will prepare a project report on the basis of work done in the industry in the relevant specific area they are working, which will be evaluated by Viva-Voce examination in the end semester.