

## HIGHER NITEC IN APPLIED FOOD SCIENCE (3 YEARS)

### CERTIFICATION

Credits required for certification:

Foundation Modules	: 24
Specialisation Modules	: 45
Life Skills Modules	: 10
Cross Disciplinary Core Modules	: 9
Elective Modules	: 8
Total	: 96

### COURSE STRUCTURE

Module Title	Credits
<b>FOUNDATION MODULES</b>	
Basic Laboratory Techniques	3
Occupational Health & Safety	3
Applied Science Fundamentals	3
Basic Mathematics	3
Analytical Laboratory Techniques	3
Good Industry Practices	3
Basic Microbiology Techniques	3
Urban Farming Laboratory Techniques	3
<b>SPECIALISATION MODULES</b>	
Introduction to Food Science	3
Food Quality Control	3
Food Processing & Equipment	3
Food Microbiology	3
Food Safety & Hygiene	3
Food Preservation Technology	3
Food Analysis	3
Food Biotechnology	3
Nutrition & Health	3
Food Quality Assurance & Standards	3
Food Product Design & Innovation	3
Industry Attachment 1	4
Industry Attachment 2	8
<b>CROSS DISCIPLINARY CORE MODULES</b>	
Food Business Marketing	3
Urban Farming Basics	3
Green Technology	3
<b>ELECTIVES (COURSE SPECIFIC)</b>	
Food Packaging	2
Food Service Operations	2

Module Title	Credits
<b>LIFE SKILLS MODULES</b>	3
For details, click <a href="#">here</a>	3

*Note: The offer of electives is subject to the training schedule of respective ITE Colleges. Students are advised to check with their Class Advisors on the availability of the elective modules they intend to pursue.*

## MODULE OBJECTIVES

### Foundation Modules

#### Basic Laboratory Techniques

On completion of the module, students should be able to adhere to laboratory safety, maintain the quality standards of chemical laboratory, perform basic laboratory techniques, carry out basic calibration and organise laboratory data.

#### Occupational Health & Safety

On completion of the module, students should be able to perform workplace housekeeping and maintain workplace safety, which includes process safety, handle hazardous materials, perform biohazard waste management as well as participate in risk assessment.

#### Applied Science Fundamentals

On completion of the module, students should be able to identify common elements of organic and inorganic molecules, nomenclature used, chemical structure and bonding, common functional groups as well as the properties associated with the various functional groups. Students should also be able to perform basic measurements, prepare stock solution and do simple dilution in the laboratory.

#### Basic Mathematics

On completion of the module, students should be able to apply the various mathematical principles such as algebra, perform unit conversion and construct graphs for laboratory data expression and analysis. In addition, they should be able to collate data and perform basic functions using common software programme.

#### Analytical Laboratory Techniques

On completion of the module, students should be able to carry out basic calibration for analytical instruments, and perform basic measurements using these analytical instruments for sample analysis.

#### Good Industry Practices

On completion of the module, students should be able to explain the importance of various industry and regulatory standards, interpret basic regulatory guidelines and adhere to good laboratory and manufacturing practices.

#### Basic Microbiology Techniques

On completion of the module, students should be able to acquire the fundamental knowledge of microbiology and perform basic microbiological techniques required for the safe-handling, examination and cultivation of microorganisms.

#### Urban Farming Laboratory Techniques

On completion of the module, students should be able to perform quality testing on growth media (water, soil, compost, etc) for the aquaculture and agriculture industries.

### Specialisation Modules

#### Introduction to Food Science

On completion of the module, students should be able to identify the various food components, including their physical, chemical and functional properties. Students should be able to evaluate the sensory properties of food and conduct sensory evaluation test. Students should be able to ensure that food label comply with legislative and regulatory standards.

### Food Quality Control

On completion of the module, students should be able to identify important quality parameters and properties/characteristics of raw materials, ingredients and products that determine their suitability, application and safety in food production. Students should also be able to perform quality inspections using suitable testing equipment and methods to assess if raw materials, ingredients and products meet quality and safety standards.

### Food Processing & Equipment

On completion of the module, students will be able to follow the safety requirements in a processing plant, explain the various methods of food preparation/processing, perform recording of process parameters, operate food preparation/processing and packaging equipment safely and carry out appropriate troubleshooting procedure on product and process deviations.

### Food Microbiology

On completion of the module, students will be able to determine the quality and safety of food samples/products using suitable microbiological test methods and perform environmental monitoring of food manufacturing facilities to verify/assess effective implementation of preventive controls for pathogens or indicator organisms.

### Food Safety & Hygiene

On completion of the module, students should be able to explain the importance of good manufacturing practices (GMP) in maintaining food hygiene standards required in both retail and non-retail food establishments. Students should also be able to perform hygiene inspection at food premises and follow up with appropriate corrective actions for non-conformances observed during inspection.

### Food Preservation Technology

On completion of the module, students should be able to apply appropriate preservation technologies/methods (such as smart packaging, chemical and physical preservation methods, etc.) and operate processing equipment to achieve improved shelf stability and safety of food products.

### Food Analysis

On completion of the module, students should be able to perform analysis using advanced laboratory and instrumental techniques such as spectroscopy, chromatography, titrimetry, etc., to assess if food products/ingredients meet nutritional, safety and regulatory requirements.

### Food Biotechnology

On completion of the module, students will be able to apply basic food biotechnology principles, understand the benefits that biotechnology bring to consumers and gain insight into the application of modern biotechnology in food processing to meet current and future demands.

### Nutrition & Health

On completion of the module, students will be able to identify the macro- and micro-nutrients that are essential for human health and understand the relationship between nutrition and health risks/concerns. Students should also be able to utilise nutritional tools, such as My Healthy Plate, nutrient databases, food composition tables, for diet planning and product development.

### Food Quality Assurance & Standards

On completion of the module, students should be able to interpret standards relating to various food safety and quality management systems (FSMS), support the development and implementation FSMS, carry out monitoring of quality parameters as well as effective record keeping and documentation to maintain a robust, reliable FSMS.

### Food Product Design & Innovation

On completion of the module, students should be able to apply design thinking concepts in the development of food products and understand the principles of various innovative food preparation/processing methods to meet consumers' needs and/or to build a sustainable food system.

### Industry Attachment

On completion of the module, students should be able to integrate and apply the skills and knowledge acquired at ITE College, and further develop competencies at the workplace.

## **Cross Disciplinary Core Modules**

### **Food Business Marketing**

On completion of the module, students should be able to appreciate the use of effective branding in food businesses and to apply various marketing strategies (including digital marketing) to promote products and services.

### **Urban Farming Basics**

On completion of the module, students should be able to set up urban farming systems using different medium (such as water-based and soil-based systems) and establish procedures to optimise agricultural production and achieve sustainable farming outcome.

### **Green Technology**

On completion of the module, students should be able to identify current global environmental issues and describe the green technology available to overcome these issues.

## **Electives (Course Specific)**

### **Food Packaging**

On completion of the module, students should be able to apply fundamental principles of food packaging and perform quality tests/checks for food packaging to protect the food from damage and degradation during shelf life of food product. Students will also be able to understand the importance of sustainable packaging in the food industry.

### **Food Service Operations**

On completion of the module, students should be able to perform daily operations in the food service industry, which include tasks such as managing inventory, handling sales transaction and maintaining quality customer service.

## **Life Skills Modules**

For details, click [here](#).