

**DEPARTMENT OF BIOENGINEERING**

**FACULTY OF ENGINEERING  
INTEGRAL UNIVERSITY, LUCKNOW**



**VALUE ADDED COURSE**

**ON**

**EVALUATION OF FOOD SAFETY AND  
PACKAGING TECHNIQUES**

**BEV-22-02**

**December 12, 2022 to December 28, 2022**

Dear All,

We are glad to announce that the Department of Bioengineering, Faculty of Engineering, Integral University, Lucknow is going to start a Value Added Course (VAC) on 'Evaluation of Food Safety and Packaging Techniques (BEV-22-02)'.

### Course Objectives

Food Science is the discipline in which biology, physical science, and engineering sciences are used to study the nature of foods, the cause of their deterioration, and the principles underlying food processing. Food Technology is the application of food science to the selection, preservation, processing, packaging, distribution and use of safe, wholesome and nutritious food. Processed food is more in demand due to its ease of handling, nutritive value, variety, and taste. High demand of processed food has led to setting up of several food processing industries that require scientists and technologists with knowledge of food processing and tackle the emerging challenges in R&D in processed foods. The food processing industry covers a range of food products. These include the basic or primary foods such as wheat and rice products, sugar, oil, and pulses and the processes for converting them into edible form and the processed foods such as biscuits and bakery products, confectionery, dairy products, breakfast foods, meat and fish products, fruits and vegetable products and all such items which are processed and packaged to enhance and prolong their edible life. The knowledge of basic concepts required for keeping the food safe and hygienic for later consumption will give an edge to the students with entrepreneur skills and help them understand the essential requirements of setting up their own facilities.

### Course Information

<b>Course Platform :</b>	<b>ILI-LMS</b>
<b>Conduct of sessions:</b>	<b>Online - Google Meet</b>
<b>Duration:</b>	<b>30 hours/ 15 Days</b>

\*Certificate of completion will be provided to each participant.

### VAC outcomes

After the completion of this training, students will be able to:

- Know about food technology and its basic concepts.
- Know about the nutritive values of varieties of food products.
- Understand the principles of cooking and know about the types of food additives and adulterants.

- Understand the basic concepts of food safety.
- Gain knowledge about the food preservation methods and techniques of food packaging.

## Schedule

**Commencement of Registration:** December 07, 2022.

**Commencement of the Course:** December 12, 2022.

**End of the Course:** December 28, 2022.

## Coordinators of the course

Dr. Kaiser Younis, Assistant Professor, Department of Bioengineering

Dr. Owais Yousuf, Assistant Professor, Department of Bioengineering

Dr. Rahul Singh, Assistant Professor, Department of Bioengineering

Ms. Poonam Sharma, Assistant Professor, Department of Bioengineering

Ms. Gazia Naseer, Assistant Professor, Department of Bioengineering

**\*Timing's:** Monday to Friday, 4-6 PM  
Saturday, 1-3 PM

## Course Curriculum

### **Module 1: Introduction to Food Technology (5 hrs + 1 Hr Quiz)**

History and development of food technology, evolution of cooking processes, fermentation processes and food preservation processes. Physico-chemical properties of food- boiling point, evaporation, melting point, smoke point, surface tension, osmosis, humidity, freezing point and specific gravity and H-ion concentration. Colloidal systems- Particle size and extent of dispersion, stability of colloids, properties of colloidal dispersion. Starch and protein colloids. Type of colloidal system in food- sol, gel, emulsion, foam.

### **Quiz1**

### **Module 2: Composition and nutritive value of plant and animal foods (5 hrs + 1 Hr Quiz)**

Cereals- production, structure, composition and storage. Novel foods: breakfast cereals, instant mixed foods, infant foods. Legumes- beans and peas. Beverages- nutritious and refreshing drinks-alcoholic and non-alcoholic. Nuts and oil seeds- coconut, groundnut, soybean (extrusion), sesame, sunflower. Spices and condiments- garlic, onion, olive oil and vinegar. Milk and milk products. Meat and meat products. Egg and egg products- nutritive value and composition. Sea foods.

### **Quiz 2**

### **Module 3: Principles of cooking, food additives and adulteration (5 hrs + 1 Hr Quiz)**

Thermal heating, Barbecue, Grilling, Steaming and Microwave. Cooking utensils and covering for microwave. Factors influencing-standing time, volume, density, defrosting. Standing time before serving and stirring. Arrangement of food. Food additives, antioxidants, sequestrants, preservatives, nutrient supplement, emulsifiers, stabilizers and thickening agents, bleaching and maturing agent, sweeteners, humectants and anti-caking agents, coloring and flavoring substance. Food adulteration: Types of adulterants- intentional and incidental adulterants, methods of detection. Health hazards and risks.

### **Quiz 3**

### **Module 4: Food Safety, quality and evaluation (5 hrs + 1 Hr Quiz)**

Evaluation of foods-physical (taste, volume, texture, viscosity) and chemical methods (pH, acidity, alkalinity, sugar concentration). Principles of food contamination- sources of microbial contamination of foods. Spoilage of foods- spoilage of fruits and vegetables, grains, milk and milk products, meat, poultry and sea foods. Preservation of foods a. physical methods: cold and heat treatment, ultra sound and microwave. b. chemical methods: organic acids, sodium chloride, sulfites, nitrites. c. antimicrobial compounds: lactoperoxidase system, lactoferrin, avidin, spices and their essential oils. Factors affecting the growth of microbes- intrinsic and extrinsic factors. Development and impact of rapid methods for the detection of food borne pathogens a. AOAC b. HACCP c. FPO d. FDA e. ISO 9000 Certification

### **Quiz 4**

### **Module 5: Food preservation and packaging (5 hrs + 1 Hr Quiz)**

Preservation of milk and production of fermented milk products (yoghurt, cheese and cultured butter milk). Meat and meat products- preservation and curing of meat. Preservation of egg and egg products. Sea foods- preservation and use of brine. Functions, types and safety measures of packaging materials. Packaging materials- aseptic and biodegradable methods. Packaging of meat, poultry, fish, sea food, fruits, vegetables and milk.

#### **Quiz 5**

