

M.Sc. Food Science and Technology

Program Outcomes (POs)

1. Apply knowledge gained in food chemistry, microbiology, engineering, and sensory evaluation to the development, processing, and preservation of safe, nutritious, and high-quality food products.
2. Design food products that meet the various food regulations and laws.
3. Trained to use advanced instruments and technologies to process and analyze food products and to solve food safety problems.
4. Critically assess and analyze food science information available in the public domain in an innovative and ethical way.
5. Competencies in all aspects of production, processing, and management in food industries and other food-related sectors, including as entrepreneurs.
6. Communicate technical and other relevant information effectively in both oral and written format to a diverse audience including supervisors, colleagues, consumers and government institutions.
7. Commitment to professionalism and ethical values.

Programme Specific Outcomes

M.Sc Food Science and Technology:

- Students learn to apply the knowledge of science, engineering fundamentals, and mathematical concepts to the solution in the field of food technology for food production, food ingredient supply, food research and development, food process engineering, food quality, and safety system, food analysis, and quality control, regulatory affairs, food marketing, etc.
- Identify, formulate, review research literature, and analyze complex Food Technology/applications problems and Design solutions for complex problems and design system components or processes that meet the specified needs with appropriate consideration for the food sustainability.
- Acquire the practical knowledge and demonstrate the ability to design, conduct/troubleshoot experiments and analyze data in the field of food technology
- Understand the impact of the professional food technology solutions in societal and environmental contexts, and apply ethical principles and commit to professional ethics and responsibilities and able to communicate effectively and write effective reports and design documentation, make effective presentations.
- Understand unit operations performed in food processing industries.
- Design, development and optimization of food process machinery and process technologies for food products.
- Implementation of food safety practices, quality control measures, quality assurance procedures and statutory and legal requirements in food processing industry.
- Understanding about food industry start-up and its management

Course Outcomes (COs) of M.Sc. Food Science & Technology

MSc (FST) I Semester

1 Food and Nutrition – 6291

The students will be able to know:

- a) The basic human nutrition needs throughout the life.
- b) The relationship of digestion, absorption and metabolism to optimal health.
- c) The function of CHO, fat, protein, vitamin, and minerals and their role in promoting and maintaining health.
- d) The accuracy, reliability, validity and use of nutrition and food science information and research.
- e) The effects of diet food, food additives and eating disorders on wellness.

2 Dairy Science – 6292

The students will be able to learn:

- a) About the production and consumption of milk and milk products in India and abroad.
- b) About the milk, its composition, nutritive value and characteristics.
- c) About the microbiology of milk, spoilage, preservation and its fermentation.
- d) About the processing of fluid milk.
- e) About the milk quality and its determination.
- f) About the cleaning and sanitation of dairy plant.

3 Microbiology – 6293

The students will be able to:

- a) Know history, scope and milestones in microbiology.
- b) Understand the microbial physiology and anatomy of prokaryotes and eukaryotes.
- c) Isolate and cultivate the microorganisms using culture media in laboratory.
- d) Understand the classification of microbes based on their nutritional requirement and other criteria.
- e) Know the regulation of biochemical pathways in microbial metabolism and nutrient uptake and transport mechanism.
- f) Understand the microbial growth and control over microorganisms (*physical and chemical*) for microbial product synthesis.
- g) Gain knowledge about the biogeochemical cycles of N, S, C, P and O in ecology.
- h) Learn about bacteria, viruses, algae, protozoa and fungi.
- i) Be aware of common microbial diseases in human beings.

4 Biochemistry – 6294

The students will be able to:

- a) Understand biochemistry at the molecular level, draw molecules and know reaction mechanisms perfectly.
- b) Understand in detail about amino acid structures, types of amino acids, classifications, structure of proteins and types of proteins.
- c) Learn the molecular structures of 20 amino acids, differentiating essential and non-essential amino acids, biologically important modified amino acids and their functions.
- d) Recognize the structural levels of organization of proteins, structure of proteins, its functions, denaturation (hemoglobin, myoglobin etc.).
- e) Learn how carbohydrates and proteins are metabolized, emphasizing the role of few intermediates of their metabolism and the role of enzymes in the regulation of the pathways.
- f) Learn lipid, lipoproteins and their functions.

5 Information Technology and Computer Applications – 6295

Students will get:

- a) To apply the theory and concepts in practical with help of software applying.
- b) To learn basics of computer and IT application in day to day running of organization.
- c) To understand the concept of Office automation.
- d) To gain knowledge of pivot table and understand the validation and auditing techniques.
- e) To learn to use different report creating techniques in MS office.
- f) To learn to use different formatting techniques in office management.
- g) To provide hands on learning of application on spreadsheets and database software.

6 Mathematics and Statistics - 6296

Students will be able:

- a) To learn to conduct survey and how to collect data.
- b) To familiarize and learn to analyze statistical data.
- c) To learn critical and creative thinking of model and its component of research.
- d) To learn basic principals in designing of simple experiment.
- e) To learn understand the uncertain occurrences of situations with logical manner
- f) To learn the development of null and alternative hypothesis

MSc (FST) II Semester

1 Food Chemistry – 6298

- a) Students will be able to know the chemistry underline the properties and the reactions of various food components.
- b) Properties of food molecules and the interaction with other food constituents.
- c) Students will acquire knowledge of biochemical reaction responsible for quality of food.
- d) Students will gain sufficient knowledge of food chemistry to control reaction in food.
- e) It will help in creating understanding about food constituents and their impact on palatability during processing.

2 Food Microbiology – 6299

The student will be able to:

- a) Know important microorganisms associated with foods.
- b) Know factors responsible for microbial growth in food.
- c) Understand microbiological spoilage of food products.
- d) Know impact of preservation methods on microbes.
- e) Describe the beneficial role of microorganism in fermented foods and in food processing.
- f) Understand the importance and significance of fermented foods and their therapeutic value.
- g) Understand the types of food infection and causative microbes involving contamination.

3 Milk and Milk Processing - 6300

After the completion of the course, the students will be able to:

- a) About the different types of milk products, their production & consumption in India and abroad.
- b) About the definition, classification, composition, nutritive value, manufacturing, packaging and storage of different milk products including yoghurt, cream, butter, butter oil, ice cream, cheese, condensed milk, dried milk, Indigenous milk products and by-products

4 Food Packaging and Storage – 6301

On successful completion of the subject, the students will be able to:

- a) Comprehend advance knowledge on the properties and production of various packaging materials and effect of various indicators used in supply chain management to indicate the food quality.
- b) Understand various types of scavengers and emitters for improving the food shelf life.
- c) Learn about consumer response about new packaging systems and safety and legislative requirements
- d) Acquaint about food-package interaction between package-flavor, gas storage systems for food storage, recycling and use of green plastics for reducing the pollution and their effect on food quality.

5 Food Process Engineering – 6302

Student will be able:

- a) To understand working and function of basic equipments of food processing.
- b) To understand the effect of different food processing techniques on food materials.
- c) To get knowledge of different unit operations required for food processing.
- d) To understand the basic laws of engineering system.

6 Technology of Food preservation – 6303

Student will be able:

- a) To gain knowledge of basic principles and methods of food preservation.
- b) To understand different types of equipment involve in various preservation techniques.
- c) To determine the preservation methods suitable for different food materials.
- d) To get knowledge on Post-harvest losses and different technique used to prevent these losses.
- e) To get knowledge of food spoilage and methods to increase their shelf life.

MSc (FST) III Semester

1 Food Evaluation and Quality Management – 7291

The student will be able to:

- a) Have basic understanding of food standard and specification, national and international food regulation.
- b) Know Aspects of food quality control and quality assurance.
- c) Perform sensory evaluation study of foods.
- d) Ensure consumer safety through analysis of food contaminants and adulterants.
- e) Understand the mechanisms and principle behind various analytical techniques.

2 Beverage Technology – 7292

Students will be able to learn

- a) *Meaning of beverage, history & types of beverages consumed worldwide.*
- b) *About the types & manufacturing of non-alcoholic beverages.*
- c) *About the types & manufacturing of alcoholic beverages.*
- d) *About the types & manufacturing of hot drinks.*
- e) *About the water importance, types available and used in manufacturing of beverages.*
- f) *About the additives used in beverages.*
- g) *About quality evaluation and shelf life of beverages.*

3 Processing of Cereals , Pulses and Oilseeds – 7293

After successful completion of the course the students will be able to:

- a) Knowledge about the structure and processing of cereal, pulses and oilseeds.
- b) Knowledge about technology of bakery products
- c) Knowledge on processing of edible oils and its modification.
- d) Students will acquire the understanding cereal milling and pulses milling and its based food products.
- e) Know about by-product utilization of various grains.

4 Processing of Flesh Food -7294

After successful completion of the course the students will be able to:

- a) Student will be able to have broad knowledge of status and scope of meat, egg, poultry industry worldwide.
- b) Understand need and importance of egg livestock and poultry industry.
- c) To understand technology behind preparation of various animal food products and by-product utilization
- d) To have better understanding of animal waste utilization.
- e) To understand need and importance of egg, poultry industry.

5 Processing of Fruits and Vegetables – 7295

After successful completion of the course the students will be able to:

- a) To know about role and importance of preservation techniques to improve the self-life of seasonal food.
- b) Student will be able to understand the technology behind canning of fruits and vegetables.
- c) To know about the role of physiological changes in fruits after harvesting.
- d) Understand manufacturing process and preserve different processed fruits and vegetables.
- e) Gain knowledge on different pre-processing operations involved before processing of fruits and vegetables.
- f) Identify the specific processing technologies used for vegetable, fruits and products derived from these materials.

6 Food Biotechnology – 7296

After the completion of the course, the students will be able to

- a) To know how to exploit microorganisms for food production.
- b) To extract and use of enzymes in food production
- c) Culturing microbes and using them in food sectors.
- d) Aware of Genetic engineering tools and procedures.
- e) Genetic modification of bacteria, plants and animals in food sector.
- f) Social, economic, ecological and safety issues of food biotechnology.