

## Broad outcome of the programme (BOP)

- To become leading Food Technology department that provides quality technical education with good research component, to develop solutions in the field of food & nutrition, health and environment.
- The department is working with a mission to cultivate creativity in teaching and research to build food science knowledge base and to promote quality learning and research.
- To establish itself as the leader in human resource development for supporting the food technology sector.
- To provide knowledge and skills for better preservation techniques, processing and value addition to agricultural products.
- To promote research and development for food product and process and guarantee sanitation and safety of processed food items.
- To provide well equipped infrastructure and research facilities to students for carrying out research smoothly in allied fields of food technology.
- To develop good professional relationship with the leading institutions at national and international level.
- To develop the spirit of competition among students and help them to cultivate enthusiasm, self-confidence, problem solving capacity, self-respect and to develop communication skills.
- To conduct placement drives for top Food and allied Industries, Institutions or Government Organization through campus selection.
- To develop awareness among the students about environmental issues and work towards sustainable developments.
- Help and Train the Students to initiate to do the startups in the field of Food Technology.

## Programme specific outcome(PSO)

PSO1: To have grounding knowledge in Biology, Food entrepreneurship based research, Food Technology and nutrition.

PSO2: To be proficient in the principles and practices of Advanced Dietetic, Health value added Food and Drug nanotechnology.

PSO3: To apply Food technology principles to biological systems to address the societal Problems such as malnutrition, nutritional disorders and food adulteration.

## Outcome of each course

### First semester

#### FT 1.1FOOD CHEMISTRY

1	Enables to understand physicochemical properties of water, carbohydrates their functional properties and inborn error caused by carbohydrates.
2	Enables to study amino acids physicochemical properties, biological functions, interaction, modified protein, applications in food industry and their metabolic defects.
3	Enables to study enzymes, lipids flavour changes in fats and oils, enzyme biological significance and metabolic disorders.

4	Enables to understand vitamins and minerals and their physiological and biochemical functions, role in different food, and deficiency diseases.
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## **FT 1.2 FOOD MICROBIOLOGY**

1	Able to understand basics concepts of microbiology, historical developments, and microbial technique
2	Able to know the techniques of preservation of foods, food hygiene and sanitation.
3	Students can understand the pathogens of food spoilage and different molecular techniques used to characterize the pathogens.
4	Able to know the different food borne diseases caused by microorganisms and a brief on different regulatory practices and policies.

## **FT 1.3 PRINCIPLES OF FOOD PROCESSING & PRESERVATION TECHNOLOGY**

1	List and identify the factors responsible for food spoilage, quality and need for preservation.
2	Compare and contrast the different low temperature food preservation methods & discuss their principles
3	Compare and contrast the different high temperature food preservation methods & discuss their principles.
4	Able to identify & discuss the applications of dehydration, membrane-based separation & irradiation as methods of food preservation.

## **FT 1.4 NUTRACEUTICALS AND FUNCTIONAL FOODS**

1	Enable to acquire the knowledge on concept, history, and evolution of nutraceuticals, anti-oxidant properties and its functional & therapeutic properties.
2	Able to learn about natural occurrence and classification, isolation techniques and stability studies of Phytochemicals/nutraceuticals
3	Learn about role of Probiotics, Prebiotics and Symbiotics as health benefits and their product development.
4	Able to gain knowledge on concept, development of functional foods, bioactive compounds and nutrigenomics concepts.

## **FT 1.5 FOOD CHEMISTRY LABORATORY**

1	Enables to understand Qualitative and quantitative test of carbohydrates, and proteins.
2	Enables to study Determination of macro and micro nutrients.
3	Enables to study Determination of iodine value, acid value and saponification values of oil.
4	Enables to understand Determination and estimation of phytochemicals.

## **FT 1.6 FOOD MICROBIOLOGY LABORATORY**

1	Good microbiology laboratory practices and introduction to different glass wares/instruments/equipment's used in microbiology laboratory
2	Preparation of different media and its application
3	Different culture techniques for the isolation of microorganisms.
4	Enumeration and characterization of the microorganisms and preservation techniques of different food.

## **FT1.7 PRINCIPLES OF FOOD PROCESSING & PRESERVATION TECHNOLOGY LABORATORY**

1	Use of theories, principles and calculation for chemical reagents preparation to conduct the experiments.
2	Design and enhance the practical approaches in estimation of carbohydrates, proteins and salt content.
3	Formulate and evaluate the experimental methods used in Food preservation experiments.
4	Gain proficiency in basic laboratory techniques in both chemistry and biology, and be able to apply the scientific method to the processes of experimentation.

## **FT 1.8 NUTRACEUTICALS AND FUNCTIONAL FOODS LABORATORY**

1	Acquire the knowledge on principal concept in determining anti-oxidant properties of nutraceuticals by different methods.
2	Learn about isolation/determination of different naturally occurring Phytochemicals.
3	Able to learn isolation of probiotic (LAB) bacteria, biochemical tests and its health benefits.

4

Gain proficiency in determining anti-nutrients in food materials.

## Second semester

### **FT 2.1 BIOANALYTICAL TECHNIQUES AND BIOSTASTICS**

1.	Students will be able to understand and explain the basic concepts of sample, collection, and handling along with chemical, and biological properties of carbohydrates.
2.	The principle and concept of analysis of various food will make students to capable of understanding the food components and adulterants in food.
3.	Student will understand the fundamental of the various separations methods and its operating principles of the various column and channel separation techniques.
4.	Student will able to Comprehend the knowledge gained on characteristics and properties of foods. Student will acquire skills to estimate the nutrient analysis by different methods for various nutrients.

## **FT 2.2 FOOD BIOTECHNOLOGY**

1	Able to acquire the knowledge of basics concepts of cell, genetics and biotechnological concepts
2	Basic Concepts and design of fermentation/fermenter for the production of various products.
3	Apply the biotechnology in the field of Biosensors and uses and application of enzymes in food industries.
4	Apply the fundamental concepts of nanotechnology in Foo industries

## **FT2.3 NUTRITION AND THERAPEUTIC FOODS**

1	Acquire knowledge on concept of nutrition, health benefits, food formulations, energy balance and deficiency, BMR and RMR and its regulation.
2	Able to learn growth monitoring and promotion, Nutrition during pregnancy, lactation and lactation period.
3	Learn about growth development from infancy, pre-school age and adulthood.
4	Able to gain knowledge on concept concepts of dietary planning and diet therapy.

## **FT 2.4 FOOD ENGINEERING AND ENZYMES IN FOOD PROCESSING**

1	Able to understand basics concepts of food energy laws related to size reduction and Familiarize with principles of fluid flow and basic unit operation principles of several food processing methods
2	Knowledge of psychometric would enable the students to evaluate and optimize the food storage conditions in food processing plants, regarding enzymes and their enzyme applications in processed food, fermentation and fermenters would enable the students to pursue their career in fermented food making industries.
3	Ability to explain the enzyme kinetics and the effects of different parameters on enzymes. Understand the application of reactors and Explain how enzymes act as biological catalysts and how they interact with specific substrate molecules
4	The enzymes are biological catalysts that catalyze the biochemical and molecular reaction which is necessary for maintenance and production of many food products.

## **FT 2.5 BIOANALYTICAL TECHNIQUES LABORATORY**

1	Pupil will Acquire knowledge on Standard solutions and the various buffer solutions.
2	Student will able to Perform quantitative, qualitative analysis and interpret analytical results of food.
3	Learner will acquire competences to use different instruments like calorimeter, UV-Visible Spectrophotometer, Chromatographic separation, HPLC, Gas chromatographic analyzer, Rheology.
4	Acquire skills to estimate the nutrient analysis by different methods for various nutrients.

## **FT 2.6 FOOD BIOTECHNOLOGY LABORATORY**

1	Use of theories, principles and calculation for chemical reagents preparation to conduct the experiments.
2	Design and enhance the practical approaches in plant biotechnology.
3	Design and enhance the practical approaches in estimation of sugar, alcohol and citric acid.
4	Design and enhance the practical approaches in synthesis of nanomaterials and applications.

## **FT 2.7 NUTRITION AND THERAPEUTIC FOODS LABORATORY**

1	Develop skills on determining glucose level in blood and urine.
2	Learn about isolation/determination of different naturally occurring Phytochemicals.
3	Gain proficiency in designing diet plan for osteoporosis, protein, Vitamin, Iron deficiency.
4	Learn on diet plan for diabetes and cardio vascular diseases.

## **FT 2.8 FOOD ENGINEERING AND ENZYMES IN FOOD PROCESSING LABORATORY**

1	Use of food engineering theories, principles and calculation for chemical reagents preparation to conduct the experiments.
2	Design and enhance the practical approaches in filtration, drying , food dehydration techniques and encapsulation procedures .
3	Formulate and evaluate the experimental methods used in the productions of enzymes (amylases, proteases, celluloses, pectinases, lipases ) experiments,
4	Experiments designed on role of enzymes, flavours in food processing industry, and be able to apply the scientific method to the processes of experimentation.

### **Third Semester**

## **FT 3.1 FOOD PRESERVATIVES, PACKAGING AND RESEARCH METHODOLOGY**

1	The knowledge of advance techniques in food processing preservation would help the students to develop novel food products with improved quality characteristics.
2	Knowledge of harmful food preservatives would make the students acquainted with the scientific and technical know-how use, reduce or eliminate food preservatives during different types of food production.
3	The students would become familiar with various novel packaging techniques and can provide their technical skills in the food package manufacturing industry.
4	The students would be able to use statistical tools during prediction and solve the problems arising in food industries.

## **FT 3.2 DAIRY TECHNOLOGY**

1	Able to know the Dairy Education & Research in India and properties of the milk.
2	Able to understand the techniques involved in processing, quality assurance of milk, and packaging of milk.
3	Students are able to know different types of milk, milk products and marketing



	strategies in India.
4	Able to know the sanitary aspects of dairy plant.

### **FT 3.3 PROCESSING TECHNOLOGY OF MEAT, POULTRY AND FISH**

1	Understand the present and future scenario of meat, poultry and fish products in India and abroad.
2	Students will have learnt about chemistry, various processing and preservation methods used for meat, fish, poultry and eggs.
3	Understand and identify the specific processing technologies used for meat, fish and poultry products.
4	Understand the safety standards in relation to meat, poultry and fish products.

### **FT3.4 POST HARVEST MANAGEMEN**

1	The students would be acquainted with the post harvesting processing of the fruits and vegetables.
2	The students would be acquainted with knowledge of processing and milling technologies of cereals.
3	The students would get opportunity to render their services in processing and quality control aspects of oil and oil products processing industries.
4	The students would be acquainted with knowledge of Spice production and processing technologies.

### **FT3.5 NUTRACEUTICALS (ELECTIVE)**

1.	Enable to acquire the knowledge on concept, history, evolution of nutraceuticals, anti-oxidant properties and its functional & therapeutic properties.
2	Able to learn about natural occurrence and classification of Phytochemicals/nutraceuticals and its role in disease management.
3	Able to gain knowledge of isolation techniques and stability studies of Phytochemicals/nutraceuticals and concept of anti-nutrients.

### **FT 3.6 FOOD PRESERVATIVES, PACKAGING AND RESEARCH METHODOLOGY LABORATORY**

1.	Students will be acquainted with the industrial techniques used to preserve and process foods, extend their shelf-life and improve their palatability characteristics.
2	Students will be familiarized with advances in food processing techniques.
3	Students will be acquainted with the principles, methods, and materials used for safe packaging of foods.
4	Students will be familiarized with national and international specifications for food preservation.

### **FT 3.7 DAIRY TECHNOLOGY LABORATORY**

1	Design the experiments for the quality analysis of the milk
2	Isolation of probiotics and other microorganism from the milk.
3	Different chemical analysis of the milk.
4	Dairy industry management and project feasibility, plan layout, cost benefit analysis.

### **FT 3.8 PROCESSING TECHNOLOGY**

1	Design and enhance the practical approaches in spoilage and preservation methods of eggs.
2	Understanding the biochemical changes during different slaughtering operation of meat products.
3	Design and enhance the practical approaches in estimation of proteins and detection of soya bean in meat.
4	Formulate and enhance the practical approaches in preparation, processing and preservation methods of meat.

### **FT 3.9 POST HARVEST MANAGEMENT LABORATORY**

<b>1</b>	Students will get experimental knowledge of how to determine the moisture content of different kinds of flour.
<b>2</b>	With the knowledge of preparation of fermented cereals, pulses based products, which are very much beneficial human health students can acquire jobs in various food industries.
<b>3</b>	Students can get the information about sensory evaluation of products which are prepared by them. This information is very helpful for them in fast food industries.
<b>4</b>	The students would be acquainted with knowledge of health benefits of fermented cereals and pulses.

## **Fourth Semester**

### **FT4.1 FOOD ADDITIVES AND BIOSTATISTICS**

1	Students will understand the chemical and technological properties of relevant food additives used as food improvement.
2	Students learn the knowledge of the food additives, the reasons of their use in foods and toxicological evaluation.
3	Students will acquire competence in the proper use of additives in safe food production.
4	Students identify the importance of data collection & its role in determining the scope of Bio-statistics. Interpret statistical results correctly and effectively.

### **FT 4.2 WASTE MANAGEMENT, FOOD LAWS AND ENTREPRENEURSHIP**

1	Students will understand the conventional and advanced waste management methods.
2	The students would be enabled to develop food quality and safety management systems in food industries.
3	Students learn the knowledge of national and international food safety laws and standards.
4	The knowledge regarding various standards and regulatory provisions would be beneficial for the students while pursuing their own entrepreneurship in the food processing sector or while finding jobs in standard making organizations.

### **FT4.3 BAKERY AND CONFECTIONARIES TECHNOLOGY**

1	Students get the knowledge of handling the equipments used in bakery units by studying Bakery equipments.
2	Students can acquire the knowledge of essential ingredients and functional properties of bread making.

3	Students get the information of making process of different confectioneries and chocolate products, bread making ,biscuits and cookies making etc
4	Bakery and Confectionery course envisages providing students with knowledge of the basic functioning of the Bakery industry.

#### **FT4.4 PROJECT WORK / DISSERTATION**

1	Development of research orientation and aptitude in the students enabling them topursue for higher research studies.
2	Hands on practical training on using various instruments and other statistical toolswill enhance the knowledge and technical experience of the students.
3	Enhancement of logical reasoning, analytical power and independent thinking tohypothesis for research problem and find its solutions.
4	Report writing, presentation and publication of results will provide platform to beinteractive with the scientific community.

#### **FT 4.5 FOOD ADDITIVES AND BIOSTATISTICS LABORATORY**

1	Understand the present and future scenario of meat, poultry and fish products in India and abroad.
2	Students will have learnt about chemistry, various processing and preservation methods used for meat, fish, poultry and eggs.
3	Understand and identify the specific processing technologies used for meat, fish and poultry products.
4	Understand the safety standards in relation to meat, poultry and fish products.

#### **FT 4.6 WASTE MANAGEMENT, FOOD LAWS AND ENTREPRENEURSHIPLABORATORY**

1.	Understand the chemical properties of water can be studied perfectly by doing standard experiments.
2	Students acquire the different practical techniques of preparation of samples and analytical methods.
3	Understand and identify the specific toxic substances present in food staffs.

4	Students will be acquainted with techniques involved in preparation of FSMS plan.
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## **FT 4.7 BAKERY AND CONFECTIONARIES TECHNOLOGY LABORATORY**

1	Understand the chemical properties of flour can be studied perfectly by doing standard experiments.
2	Students acquire the different practical techniques of preparation of varieties of bakery and confectionary products.
3	Understand and identify the specific processing technologies used bakery and confectionary industry.
4	Students will be acquainted with techniques involved in advanced baking and confectionery.

### **Course outcome (CO)**

CO1: Apply the knowledge of science, engineering fundamentals, and mathematical concepts to the solution in the field of food technology.

CO2: 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.

CO3: Acquire the practical knowledge and demonstrate the ability to design, conduct/troubleshoot experiments and analyze data in the field of food technology

CO4: 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 communicate effectively and write effective reports and design documentation, make effective presentations.