DEPARTMENT OF FOOD TECHNOLOGY

REGULATION -2023

Vision and Mission of The Department:

Vision:

Prepare the food engineers to pursue their goals and to have successful career as competent technologist, scientist, researchers, entrepreneurs and personalities which benefits the public welfare through rigorous service in their challenging field.

Mission:

M 1: Upgrade the scientific knowledge with a lifelong follow up in the areas of food science, food processing and safety for the development of food products through quality research.

M 2: Extend to know how to identify and analyse the opportunities in Food Technology to adopt strategies that ensure socio-economic growth by collaborating with industries.

M 3: Providing research and professional services to streamline and optimize operations which contribute to the enhancement of the quality of life.

M4: Develop socially responsible professionals and entrepreneurs who are capable of sustainable engineering practices for food industry.

Program Educational Objectives (PEOs)

This Course is conducted to achieve the following Programme Educational Objectives (PEOs):

PEO 1. Student will be able to pursue higher education in India or abroad in the field of Food Technology and it's related field and take up the competitive exams.

PEO2: Student will be able to come up with solutions for any technical and scientific problems related to Food Technology in institution, industry and society.

PEO3: Student will get familiarized in job related skills like communication, designing of experiments and entrepreneur skills in the field of food technology.

Program Outcomes (POs)

PO1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations..
PO6	**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice
PO9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one‘s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs):

PSO1: Apply basic skills and knowledge in Engineering to develop innovative food processing techniques and food products.

PSO2: Adapt multidisciplinary approaches to solve food industry problems and ensure food quality and safety.

PSO3: Develop critical thinking and problem-solving skills in the domain of food technology with professional integrity and ethical values.

Course Outcomes (Cos) of All Courses.

Autonomous Regulation – R2023

S.NO	COURSE CODE.	SUBJECT CODE	COURSE TITLE
1	C101	U23HS101	Communicative English
2	C102	U23MA101	Engineering Mathematics
3	C103	U23PH101	Engineering Physics - I
4	C104	U23CY101	Engineering Chemistry
5	C105	U23GE101	C- Programming
6	C106	U23GE102	Engineering Graphics
7	C107	U23BS101	Physics and Chemistry Laboratory
8	C108	U23GE103	C-Programming Laboratory
9	C109	U23HS201	Functional English
10	C110	U23MA201	Advanced Calculus and Ordinary Differential Equations
11	C111	U23PH201	Engineering Physics - II
12	C112	U23GE201	Python Programming
13	C113	U23FT201	Fundamentals of Bio -Chemistry
14	C114	U23FT202	Microbiology
15	C115	U23GE203	Engineering Practices Laboratory
16	C116	U23GE204	Python Programming Laboratory
17	C117	U23FT203	Fundamentals of Bio ChemistryLaboratory.
18	C201	U23MA301	Transforms and Partial DifferentialEquations
19	C202	U23FT301	Food Process Calculations
20	C203	U23FT302	Unit Operations in Food Processing
21	C204	U23FT303	Food Science and Nutrition
22	C205	U23FT304	Fluid Mechanics
23	C206	U23FT305	Thermodynamics
24	C207	U23FT306	Unit Operations Laboratory
25	C208	U23FT307	Food Science and Nutrition Laboratory
26	C209	U23HS301	Interpersonal Skills/Listening and Speaking
27	C210	U23MA403	Probability and Statistics
28	C211	U23HS202	Environmental Science and Engineering
29	C212	U23FT401	Fundamentals of Heat and Mass Transfer
30	C213	U23FT402	Food Microbiology
31	C214	U23FT403	Food Chemistry
32	C215	U23FT404	Properties of Food Materials
33	C216	U23FT405	Heat and Mass Transfer Laboratory
34	C217	U23FT406	Food Microbiology Laboratory
35	C218	U23HS401	Advanced Reading and Writing
36	C301	U23FT501	Food Analysis

37	C302	U23FT502	Refrigeration and Cold Chain Management
38	C303	U23FT503	Food Processing and Preservation
39	C304	U23FT512	Fermentation Technology
40	C305	U23FT504	Food Analysis Laboratory
41	C306	U23FT505	Food Processing and Preservation Laboratory
42	C307	U23HS501	Professional Communication
43	C308	U23FT601	Baking and Confectionary Technology
44	C309	U23FT602	Fruits and Vegetable Processing Technology
45	C310	U23FT622	Nutraceutical and Functional Foods
46	C311	U23FT634	Separation Techniques in Food Processing
47	C312	U23FT643	Food Quality Assurance andControl
48	C313	U23FT753	Post Harvest Technology
49	C314	U23FT603	Baking and Confectionary TechnologyLaboratory
50	C315	U23FT604	Fruits and Vegetable Processing TechnologyLaboratory
51	C401	U23FT701	Dairy Technology
52	C402	U23FT702	Food Packaging Technology
53	C403	U23GE801	Professional Ethics in Engineering
54	C404	U23FT764	Technology of Fats and Oils
55	C405	U23FT873	Food Industrial Waste Management
56	C406	U23FT703	Dairy Technology Laboratory
57	C407	U23FT704	Testing of Packaging Materials Laboratory
58	C408	U23FT801	Project Work

SEMESTER-I

U23HST11 (C101) COMMUNICATIVE ENGLISH

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C101.1	Speak clearly, effortlessly, confidently and appropriately.
C101.2	Write coherently with acceptable accuracy, organizing ideas logically.
C101.3	Listen and comprehend different discourses and genres of texts.
C101.4	Read and comprehend different discourses and genres of texts.
C101.5	Read and infer, analyze, predict, interpret and draw conclusions any printed text.
C101.6	Enhance them to give operational talk.

U23MAT12 (C102) MATRICES AND CALCULUS

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C102.1	Use the matrix algebra methods for solving practical problems.
C102.2	Use both the limit definition and rules of differentiation to differentiate functions.
C102.3	Apply differential calculus tools in solving various application problems.
C102.4	Able to use differential calculus ideas on several variable functions.
C102.5	Apply multiple integral ideas in solving areas, volumes and other practical problems.
C102.6	Solve the ordinary differential equations using different techniques for that model engineering problems

U23CYT14 (C103) CHEMISTRY FOR ENGINEERING & TECHNOLOGY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C103.1	Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.
C103.2	Apply the basic knowledge of Corrosion and various electrodes.
C103.3	Know the economically and new methods of synthesis nano materials.
C103.4	Apply the knowledge of phase rule and composites for material selection requirements.
C103.5	Understand the concepts of suitable fuels for engineering processes and applications.
C103.6	Have the knowledge of different forms of energy resources and apply them for suitable applications in energy sectors.

U23PHT13 (C104) PHYSICS FOR ENGINEERS AND TECHNOLOGISTS

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C104.1	Differentiate the elastic and plastic nature of the materials.
C104.2	Know the experimental techniques in both production and applications of ultrasonic waves.
C104.3	Gain knowledge in the basics of quantum mechanics concepts.
C104.4	Develop new devices based on LASER source.
C104.5	Understand the advantages of optical fiber than metal wire.
C104.6	Demonstrate some useful experiments based on optical fibre.

U23GET16 (C105) ENGINEERING GRAPHICS

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C105.1	Identify the significance of graphics in engineering applications.
C105.2	Project straight lines inclined to both principal planes and determine true lengths and inclinations.
C105.3	Apply orthographic projection techniques to project solids.
C105.4	Apply the principles of development to prisms, pyramids, cylinders, and cones.
C105.5	Combine two solid objects in simple vertical positions using isometric projection.
C105.6	Utilize the isometric scale effectively

U23HSP12 (C107) ENGLISH LABORATORY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C107.1	Identify and comprehend complex academic texts.
C107.2	Interpret accurately and fluently in formal and informal communicative contexts.
C107.3	Demonstrate their opinions effectively in both oral and written medium of communication.
C107.4	Plan travelogue and construct paragraphs on various aspects.
C107.5	Develop journal reading skills and small talk.
C107.6	Utilizing technical terms and making power point presentations..

U23BSP11 (C108) PHYSICS AND CHEMISTRY LABORATORY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C108.1	Understand the functioning of various physics laboratory equipment.
C108.2	Observe and tabulate experimental data.
C108.3	Solve problems individually and collaboratively .
C108.4	Analyse the quality of water samples with respect to their acidity, alkalinity.
C108.5	Determine the amount of hardness in the water.
C108.6	Analyse quantitatively the impurities in solution by electro analytical techniques.

U23GEP14 (C109) ENGINEERING PRACTICES LABORATORY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C109.1	Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work.
C109.2	Wire various electrical joints in common household electrical wire work.
C109.3	Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common Household equipments; Make a tray out of metal sheet using sheet metal work.
C109.4	Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB .
C109.5	Apply fundamental engineering principles to analyse and solve real-world problems.

SEMESTER: II

U23MAT22 (C110) STATISTICS AND NUMERICAL METHODS

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C110.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C110.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
C110.3	Solve the algebraic and transcendental equations.
C110.4	Understand the knowledge of numerical techniques of interpolation in various intervals
C110.5	and apply the numerical techniques of differentiation and integration for engineering problems.
C110.6	Solve the ordinary differential equations with initial and boundary conditions by using certain

U23HST21 (C110) PROFESSIONAL ENGLISH

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C111.1	Compare and contrast products and ideas in technical texts.
C111.2	Identify cause and effects in events, industrial processes through technical texts.
C111.3	Analyze problems in order to arrive at feasible solutions and communicate them orally and in the written format.
C111.4	Motivate students to write reports and winning job applications.
C111.5	Recall and comprehend different discourses and genres of texts.
C111.6	Making the students to become virtuous presenters.

U23PHT26 (C112) PHYSICS OF MATERIALS

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C112.1	Know basics of crystallography and its importance for varied materials properties.
C112.2	Gain knowledge on the magnetic and superconductor properties of materials and their applications.
C112.3	Illustrate the SMA and metallic glasses.
C112.4	Gain knowledge in the development of instruments.
C112.5	Get knowledge about radioactive materials.
C112.6	Understand the concept of detectors and counters.

U23GET15 (C113) PROBLEM SOLVING AND PYTHON PROGRAMMING

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C113.1	Develop algorithmic solutions to simple computational problems
C113.2	Develop and execute simple Python programs
C113.3	Write simple Python programs using conditionals and looping for solving problems
C113.4	Decompose a Python program into functions
C113.5	Represent compound data using Python lists, tuples, dictionaries etc
C113.6	Read and write data from/to files in Python programs

U23EET25 (C114) BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C114.1	Compute the electric circuit parameters for simple problems.
C114.2	Explain the concepts of domestics wiring.
C114.3	Explain the concepts of protective devices.
C114.4	Explain the working principle and applications of electrical machines.
C114.5	Analyze the characteristics of analog electronic devices.
C114.6	Explain the types and operating principles of sensors and transducers

U23EEP24 (C116) BASIC ELECTRICAL, ELECTRONICS AND INSTRUMENTATION ENGINEERING LABORATORY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C116.1	Use experimental methods to verify the Ohm's law
C116.2	Use experimental methods to verify the Kirchhoff's Law
C116.3	Use experimental methods to measure three phase power
C116.4	Analyze experimentally the load characteristics of electrical machines
C116.5	Analyze the characteristics of basic electronic devices
C116.6	Use LVDT to measure displacement

U23HSP22 (C117) COMMUNICATION LABORATORY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C117.1	Distinguish their technical competency through language skill.
C117.2	Predict context effectively in-group discussions held in a formal / semi-
C117.3	formal discussions.
C117.4	Understanding candidates' key characteristics.
C117.5	Finding personality traits by sharing and comparing thoughts and ability.
C117.6	Understanding the value of ethics.(rules and regulations).

U23GEP13 (C117) PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C117.1	Develop algorithmic solutions to simple computational problems
C117.2	Develop and execute simple Python programs.
C117.3	Implement programs in Python using conditionals and loops for solving problems.
C117.4	Deploy functions to decompose a Python program.
C117.5	Process compound data using Python data structures.
C117.6	Utilize Python packages in developing software applications.

SEMESTER: III

U23MAT31 (C201) TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C201.1	Understand how to solve the given standard partial differential equations.
C201.2	Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
C201.3	Appreciate the physical significance of Fourier series techniques in solving one- and two-dimensional heat flow problems and one-dimensional wave equations.
C201.4	Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering.
C201.5	Use the effective mathematical tools for the solutions of partial differential equations by using Z-transform techniques for discrete time systems.
C201.6	To study the Laplace Transforms, properties of Laplace Transform and some applications to solve the differential equations and integral equations

U23FTT31 (C202) FOOD PROCESS CALCULATIONS

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C202.1	Apply different systems of units and dimensions,
C202.2	estimate compositions of mixtures and solutions
C202.3	Apply material balance for different unit operations
C202.4	Apply material balance for recycle operations and perform humidification calculations.
C202.5	Perform energy balance calculations.
C202.6	Determine the GHV, NHV and composition of fuels.

U23FTT32 (C203) BIOCHEMISTRY AND NUTRITION

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C203.1	Apply knowledge of nutrition in diet planning.
C203.2	Provide the dietary recommendations for NCD's
C203.3	Asses the quality of proteins and lipids from various sources.
C203.4	Comprehend the physiological and toxicological effects of vitamins and minerals.
C203.5	Apply the learnt techniques to assess the lifestyle related NCD's.
C203.6	Asses the Health implications of high energy foods

U23FTT33 (C204) UNIT OPERATIONS IN FOOD PROCESSING

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C204.1	Understand the principles of separation methods used in the process industry. to appreciate different equipment's developed for separation.
C204.2	Develop the various separations methods techniques.
C204.3	Understand the knowledge of size reduction in food processing units.
C204.4	Able to explain about the equilibrium separation methods.
C204.5	Design the crystallizers and distillation equipments.
C204.6	To apply the concepts in computer software to simulate food processing operations

U23FTT34 (C205) POST HARVEST ENGINEERING

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C205.1	Apply the post-harvest engineering to prevent loss.
C205.2	Infer the different cleaning, threshing and grading operations involved in food industry.
C205.3	Utilize the conveyors in the food industry
C205.4	Apply the storage principles in extending the shelf-life of commodity.
C205.5	Identify the primary and secondary microorganisms of stored food grains

U23GET41 (206) ENVIRONMENTAL SCIENCES AND ENGINEERING

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C206.1	Environmental Pollution or problems cannot be solved by mere laws.
C206.2	Public participation is an important aspect which serves the environmental Protection.
C206.3	Public awareness of environmental is at infant stage.
C206.4	Ignorance and incomplete knowledge has lead to misconceptions
C206.5	Development and improvement in std. of living has lead to serious environmental
C206.6	Establish the Sustainability Practices

U23FTP31 (C207) BIOCHEMISTRY AND NUTRITION LABORATORY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C207.1	Learn basic measurement in food processing.
C207.2	Learn the basic chemical analysis
C207.3	Apply the learnt basic chemistry involved in food testing.
C207.4	Assess the nutritional anthropometry
C207.5	Assess the clinical status of the individuals.
C207.6	Assess the nutrient composition of foods.

U23FTP32 (C208) UNIT OPERATIONS IN FOOD PROCESSING LABORATORY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C208.1	The basic principles of chemical Demonstrate engineering and its applications.
C208.2	Apply the skill of material balance and energy balance in unit operations unit
C208.3	Process
C208.4	To develop knowledge on the basic principles of chemical engineering and its
C208.5	applications.
C208.6	Be able to apply the skill of material balance in unit operations unit process

SEMESTER: IV

U23MAT42 (C209) PROBABILITY AND OPERATIONS RESEARCH

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C209.1	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
C209.2	Understand the basic concepts of one- and two-dimensional random variables and apply in engineering applications.
C209.3	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C209.4	Apply the basic concepts of classifications of design of experiments in the field of agriculture and statistical quality control.
C209.5	Have the notion of sampling distributions and statistical techniques used in engineering and management problems.

U23FTT41 (C210) FOOD CHEMISTRY AND PRESERVATION

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C210.1	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
C210.2	Understand the basic concepts of one- and two-dimensional random variables and apply in engineering applications.
C210.3	Apply the concept of testing of hypothesis for small and large samples in real life problems.
C210.4	Apply the basic concepts of classifications of design of experiments in the field of agriculture and statistical quality control.
C210.5	Have the notion of sampling distributions and statistical techniques used in engineering and management problems.

U23FT402 (C211) FOOD MICROBIOLOGY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C211.1	Recognize the sources and factors influencing the microbial growth.
C211.2	Identify the techniques used to assess the microbial load**.**
C211.3	Apply the knowledge of microorganisms in fermentation process.
C211.4	Interpret microbial spoilage of different foods.
C211.5	Distinguish food borne diseases and intoxication caused by microorganisms**.**

U23FT404 (C212) PROPERTIES OF FOOD MATERIALS

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C212.1	Interpret the physical properties of agricultural materials.
C212.2	Elaborate the thermal properties and its application.
C212.3	Outline the optical and electromagnetic properties.
C212.4	Recognize the rheological properties of food materials.
C212.5	Infer textural properties and color measurements of food materials.

U23FTT35 (C213) THERMODYNAMICS IN FOOD INDUSTRIES

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C213.1	Outline the basic concepts and apply the first law of thermodynamics in selected Processes
C213.2	Understand the principle of second law of thermodynamics
C213.3	Interpret the second law of thermodynamics and relate the properties of pure substance
C213.4	Demonstrate the interrelationship between thermodynamic cycles
C213.5	Integrate the use of thermodynamics in product formation

U23GET61 (C214) HUMAN VALUES AND ETHICS

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C214.1	Understand definition and classification of values.
C214.2	Understand purusartha.
C214.3	Understand sarvodaya idea.
C214.4	Understand sustenance of life.
C214.5	Understand the hierarchy of values.

U23FTP41 (C215) FOOD CHEMISTRY AND PRESERVATION LABORATORY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C215.1	Assess the moisture content and drying rate for both porous and non-porous food Materials
C215.2	Evaluate the efficiency of different types dryers for the food materials
C215.3	Analyze the changes occur during thermal processing of foods
C215.4	Assess the microbial quality of foods by applying novel processing methods
C215.5	Investigate chemical reactions in Chemical preservation

U23FTP42 (C216) FOOD MICROBIOLOGY LABORATORY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C216.1	Complete understanding of isolation and characterization of various microbes associated with foods
C216.2	Familiarize with microbial techniques for study of foods.
C216.3	Methods for quantification of Microbes.
C216.4	To analyse and identify microbial contamination in food
C216.5	To analyze the microbiological quality

U23HSP41 (C217) COMMUNICATION SKILLS

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C217.1	Listen and respond appropriately.
C217.2	Listen to a process information
C217.3	Assess the accuracy and fluency in talking
C217.4	Participate in group discussions
C217.5	Summarizing academic readings

SEMESTER: V

U23FTT51 (C301) FOOD ANALYSIS

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C301.1	Understand the principles behind analytical techniques in food analysis.
C301.2	Explain the methods of selecting appropriate techniques in the analysis of food products.
C301.3	Explain the role of food analysis in food standards and regulations for the manufacture and the sale of food products and food quality control in food industries.
C301.4	Demonstrate about the chromatographic techniques-HPLC, GC.
C301.5	Apply the current state of knowledge in food analysis.

U23FTT52 (C302) HEAT AND MASS TRANSFER IN FOOD PROCESSES

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C302.1	Apply the basic concepts of heat flow
C302.2	Assess the mode of heat transfer.
C302.3	Discuss the radiation mode of heat transfer.
C302.4	Interpret mass transfer operations in food processing.
C302.5	Interpret Unit operations in food processing

U23FTV11 (C303) FRUITS AND VEGETABLES PROCESSING TECHNOLOGY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C303.1	Understand the principles of food processing and preservation.
C303.2	Explain the role of different methods the processing of different foods and their impact on the shelf life, quality, and other physical and sensory characteristics of foods.
C303.3	Illustrate the recent methods of minimal processing of foods to understand the materials and types of packaging for foods.
C303.4	Explain the recent methods of different preservatives and preservation.
C303.5	Apply the principles of food packaging and considerations.

U23FTV12 (C304) BAKING AND CONFECTIONARY TECHNOLOGY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C304.1	Apply the principles of microbiology in the production of fermented foods
C304.2	Classify fermentation process and maintain aseptic conditions in a fermentation process.
C304.3	Relate the process parameters in aeration and agitation of a fermentation operation.
C304.4	Make use of concepts of fermentation in dairy, meat, cereal and beverage products.
C304.5	Identify processes involved in production of various fermented products.

U23FTV43 (C305) FOOD FERMENTATION TECHNOLOGY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C305.1	Understanding concepts, principles and procedures involved in the area of fermented food production.
C305.2	Familiarizing with different fermenter types and their design criteria
C305.3	Understand the technology involved in the fermented foods
C305.4	Understand the methods for the production of fermented foods
C305.5	Know more about the organisms involved in fermentation

U23FTV43 (C306) FOOD ANALYSIS LABORATORY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C306.1	Analyzethe foods and food products for chemical components. Knowing standards for food products.
C306.2	Obtain knowledge of adulterants in foods.

U23FTP52 (C307) HEAT AND MASS TRANSFER IN FOOD PROCESSES LABORATORY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C307.1	Evaluate the process/performance parameters for mass transfer operations
C307.2	Determine diffusivity and Stefan Boltzman constant using fundamental principles
C307.3	Understand and apply the principles in heat transfer phenomena
C307.4	Understand and apply the principles in mass transfer phenomena
C307.5	Design heat and mass transfer equipments.

SEMESTER: VI

U23FTT61 (C309) REFRIGERATION AND COLD CHAIN MANAGEMENT

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to explain:
C309.1	Interpret the basics of refrigeration with thermodynamic principles and Carnot cycle. (K1)
C309.2	Make use of the concept of refrigeration cycles.
C309.3	Identify various components of refrigeration system and its types.
C309.4	Adapt low temperature storage systems for foods.
C309.5	Apply cold chain and refrigeration for food products.

U23FTT62 (C310) FOOD PROCESS ENGINEERING

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C310.1	Apply the knowledge of physical properties of foods during the processing.
C310.2	Evaluate time temperature required to achieve desired shelf life of foods
C310.3	Explain the principles and current practices of mixing and the effects of processing parameters on product quality.
C310.4	Interpret the encapsulation technology available in the field of processing
C310.5	Asses the antioxidant activity .

U23FTT63 (C311) ENTREPRENEUR AND START UPS IN FOOD SECTORS

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C311.1	Infer the concepts of separation and filtration techniques
C311.2	Select suitable membrane process and cleaning techniques
C311.3	Classify and adapt appropriate adsorption techniques.
C311.4	Apply the concepts of ionic separation and permeation.
C311.5	Elaborate other separation processes and effluent treatment.

U23FTV15 (C312) MEAT, FISH AND POULTRY PROCESSING

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C312.1	Identify suitable food quality standards
C312.2	Apply principles of quality assurance and quality management systems in food industries.
C312.3	Appraise various regulations for food business operator.
C312.4	Adapt and interpret sampling and statistical quality control techniques.
C312.5	Take part in sensory analysis of foods.

U23FTV24 (C313) PRINCIPLES OF FOOD SAFETY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C313.1	Assess food safety hazards and sources of spoilage and contamination.
C313.2	Identify physical and chemical hazards in the food chain and understand food safety measures.
C313.3	Implement sanitation practices and HACCP in food processing environments
C313.4	Evaluate the safety of drinking water and apply guidelines for water quality
C313.5	Navigate food safety regulations and understand the role of food safety management systems.

U23GET72 (C314) TOTAL QUALITY MANAGEMENT

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C314.1	Ability to apply TQM concepts in a selected enterprise
C314.2	Ability to apply TQM principles in a selected enterprise.
C314.3	Ability to understand Six Sigma and apply Traditional tools, New tools, Benchmarking and FMEA.
C314.4	Ability to understand Taguchi's Quality Loss Function, Performance Measures and Apply QFD, TPM, COQ and BPR.
C314.5	Ability to apply QMS and EMS in any organization.

U23FTP61 (C315) FOOD PROCESS ENGINEERING LABORATORY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C315.1	Understand heat, mass and momentum transfer analysis.
C315.2	Validation of a thermal process
C315.3	Analyze industrial problems along with appropriate approximations and boundary Conditions
C315.4	Interpret the encapsulation technology available in the field of processing.
C315.5	Develop novel products using extrusion cooking.

U23FTP62 (C315) BAKING AND CONFECTIONERY TECHNOLOGY LABORATORY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C315.1	Analyze the quality of flour and other ingredients used for preparation of bakery products
C315.2	Prepare the bakery product and evaluate its properties
C315.3	Formulate confectionery products and perform sensory properties

SEMESTER: VII

U23FTT71 (C401) FOOD PLANT LAYOUT AND ECONOMICS

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C401.1	Gain knowledge on the various factors involved in setting up a Food Processing Industry.
C401.2	Understand the process of food plant layout design.
C401.3	Apply their knowledge to design projects for setting up a Food Processing Industry.
C401.4	Analyse the problems involved in deciding the level of manufacture of a food product
C401.5	Evaluation of the options involved in the system

U23FTT72 (C402) DAIRY TECHNOLOGY

Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C402.1	Identify the physico-chemical properties of milk.
C402.2	Apply the acquired knowledge on raw milk collection, transportation and reception.
C402.3	Infer the technical aspects of fluid milk processing and production of milk products.
C402.4	Select and design appropriate dairy processing equipments.
C402.5	Choose suitable cleaning operations in dairy industry.

U23GE801 (C403) PROFESSIONAL ETHICSINENGINEERING

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C403.1	Apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.
C403.2	Understand the basic perception of profession, professional ethics, various moral & social issues, industrial standards, code of ethics and role of professional ethics in engineering field.
C403.3	Aware of professional rights and responsibilities of an engineer, responsibilities of an engineer for safety and risk benefit analysis.
C403.4	Acquire knowledge about various roles of engineers in variety of global issues and able to apply ethical principles to resolve situations that arise in their professional lives.
C403.5	Understand the role of professional bodies. (K1)

U23FTV25 (C404) FOOD SAFETY AND QUALITY CONTROL

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C404.1	Analyze consumer demands and issues related to food safety strategies
C404.2	Assess food hazards, control measures for foodborne diseases, and allergen management.
C404.3	Apply microbial growth models and rapid detection techniques in food safety
C404.4	Navigate the organizational structures of major food safety regulatory agencies.
C404.5	Develop and maintain effective food safety management systems, including HACCP and ISO standards

U23FTV33 (C405) FOOD STRUCTURING TECHNIQUES

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C405.1	Aware techniques of developing structured food products.
C405.2	Understand the concepts and principles of food structuring.
C405.3	Assimilate the modern techniques of food structure development.
C405.4	Evaluate the technical and functional performance of structured food materials
C405.5	Evaluate the methods for determining the structure of foods containing polyphases

U23FT703 (C405) DAIRY TECHNOLOGY LABORATORY

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C405.1	Demonstrate the dairy process technology.

U23FTP72 (C407) MINI-PROJECT

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C406.1	Prepare their final year project work and find solution by formulating proper methodology.
C406.2	Inculcate innovative thinking and thereby preparing students for main project.

C406.3	Learn to make decisions on how to work independently to research and develop their project
C406.4	Find new ideas on various Food processing methods
C406.5	Involve in developing new food products, improving the safety and quality of existing products, or reducing food waste.

U23FTP73 (C407) INDUSTRIAL TRAINING/INTERNSHIP - II

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C407.1	Analysis of industrial / research problems and their solutions
C407.2	To find solutions to the research problems
C407.3	Documenting of material specifications
C407.4	Documenting of machine and process parameters
C407.5	Documenting of testing parameters and results

SEMESTER: VIII

U23FTP81 (C408) PROJECT WORK

COURSE OUTCOMES:	
Course Code	**Course Outcomes**
	Upon completion of the course, the students will be able to:
C408.1	Take up any challenging practical problems and find solution by formulating proper methodology
C408.2	Apply the acquired technical knowledge and skills to solve real time problems.
C408.3	Design and fabricate food processing equipments.
C408.4	Formulate and develop value added food products. (K1)
C408.5	Apply scientific research tools for design and optimization of food processing operations.