



MANAKULA VINAYAGAR INSTITUTE OF TECHNOLOGY

Kalitheerthalkuppam, Madagadipet, Puducherry - 605 107

DEPARTMENT OF FOOD TECHNOLOGY

REGULATIONS 2019- 2020

S. No.	Course Code	Name of the Subjects
SEMESTER I		
1	C101	Mathematics – I
2	C102	Physics
3	C103	Chemistry
4	C104	Basic Civil and Mechanical Engineering
5	C105	Engineering Mechanics
6	C106	Communicative English
7	C107	Physics Laboratory
8	C108	Chemistry Laboratory
9	C109	Workshop Practice
SEMESTER II		
10	C110	Mathematics – II
11	C111	Material Science
12	C112	Environmental Science
13	C113	Basic Electrical and Electronics Engineering
14	C114	Engineering Thermodynamics
15	C115	Computer Programming
16	C116	Computer Programming Laboratory
17	C117	Engineering Graphics
18	C118	Basic Electrical and Electronics Laboratory
19	C119	NSS / NCC
SEMESTER III		
20	C201	Fourier Series and Partial Differential Equations
21	C202	Introduction to Food Processing
22	C203	Food Process Calculations
23	C204	Food Microbiology
24	C205	Principles of Fluid Mechanics
25	C206	Food Chemistry
26	C207	Food Microbiology Laboratory
27	C208	Food Chemistry Laboratory
28	C209	Fluid Mechanics and Machinery Laboratory
SEMESTER IV		
29	C210	Probability and Statistics
30	C211	Food Analysis
31	C212	Fundamentals of Heat and Mass Transfer
32	C213	Nutritional Biochemistry
33	C214	Thermodynamics
34	C215	Unit Operations for Food Processing
35	C216	Food Analysis Laboratory
36	C217	Unit Operations Laboratory
37	C218	Nutritional Biochemistry Laboratory
38	C219	Physical Education



SEMESTER V		
39	C301	Food Additives
40	C302	Enzyme and Fermentation Technology
41	C303	Refrigeration and Cold Chain Management
42	C304	Food Processing and Preservation
43	C305	Elective I - Pulse and Oil Seed Technology
44	C306	Elective II - Food Process Equipment Design
45	C307	Food Processing and Preservation Laboratory
46	C308	Enzymes and Fermentation Technology Laboratory
47	C309	General Proficiency - I
SEMESTER VI		
48	C310	Food Process Engineering
49	C311	Baking and Confectionary Technology
50	C312	Fruits and Vegetable Processing
51	C313	Elective III - Cereal Technology
52	C314	Elective IV - Food Plant Layout
53	C315	Fruits and Vegetable Processing Laboratory
54	C316	Baking and Confectionary Technology Laboratory
55	C317	General Proficiency – II
SEMESTER VII		
56	C401	Dairy Process Technology
57	C402	Food Safety, Quality and Regulation
58	C403	Food Packaging Technology
59	C404	Elective V - Speciality Foods
60	C405	Elective VI - Downstream Processing
61	C406	Testing of Packaging Materials Laboratory
62	C407	Dairy Process Technology Laboratory
63	C408	Industrial Visit/Training
64	C409	Project Work-I
SEMESTER VIII		
65	C410	Professional Ethics
66	C411	Process Economics and Industrial Management
67	C412	Meat, Fish and Poultry Processing Technology
68	C413	Electives VII - Storage Engineering
69	C414	Electives VIII - Emerging Technologies in Food Processing
70	C415	Project Work-II



COURSE OUTCOMES

SEMESTER - I

Course Name: C101	
MATHEMATICS - I	
C101.1	Apply knowledge of mathematics to solve functions of several variables.
C101.2	Identify, formulate, and solve engineering problems like multiple integrals and their usage.
C101.3	To solve differential equations that model physical processes using effective mathematical tools
C101.4	Able to find equation of straight line of shortest distance, equation of plane, angle between straight lines.
C101.5	Gain the knowledge to solve first order differential equation arising in Engineering

Course Name: C102	
PHYSICS	
C102.1	Apply knowledge of science and engineering to understand physics and its significant contributions in the advancement of technology and invention of new products that dramatically transform modern-day society.
C102.2	Identify different areas of physics which have direct relevance and applications to different Engineering disciplines.
C102.3	Apply fundamental knowledge to understand applications of Ultrasonics, optics and some optical devices, Lasers and Fiber optics, Nuclear energy sources and wave mechanics.
C102.4	Understand the basic operating principles of laser, its applications, optical fiber, and its types, transmission characteristics, applications of optical fibers.
C102.5	Understand the basic operating principles of laser, its applications, optical fiber, and its types, transmission characteristics, applications of optical fibers.

Course Name: C103	
CHEMISTRY	
C103.1	Apply knowledge of science and engineering to understand the importance of Chemistry in Engineering domain
C103.2	Identify different Electrochemical cells and their usage for industrial process
C103.3	Apply fundamental knowledge of chemistry and build an interface of theoretical concepts with industrial applications / engineering applications.
C103.4	Guide the students to gain the knowledge about the cooling curves, phase diagrams, alloys and their practical importance.
C103.5	Strengthen the fundamentals of chemistry and then build an interface of theoretical concepts with their industrial/engineering applications.



Course Name: C104 BASIC CIVIL AND MECHANICAL ENGINEERING	
C104.1	Get an idea about construction procedure and steps involved in component design of the building.
C104.2	Understand the manufacturing processes such as casting, forming, joining, and machining
C104.3	Apply the Functions of Prime movers, working of IC engines and refrigerator Understand.
C104.4	Understand the basic operation and function of logic gates flip flops, registers and counters.
C104.5	Gain knowledge on various communication systems and network models.

Course Name: C105 ENGINEERING MECHANICS	
C105.1	Apply knowledge of mathematics, science and engineering to analyze the vector and scalar representation of forces and moments, static equilibrium of particles and rigid bodies in two dimensions
C105.2	Design and conduct experiment, as well as to analyze the effect of friction on equilibrium and the laws of motion, the kinematics of motion and the interrelationship and analyze dynamic equilibrium equation
C105.3	Design, construct and analyze Engineering Mechanics through solved examples
C105.4	Can able to understand the role of refrigeration as energy system. Students gain the in depth knowledge of working of various refrigeration system and use of refrigerant in refrigeration system. Ability to analyse the efficiency of different types of refrigeration system.
C105.5	To develop an intuitive understanding of underlying physical mechanism and a mastery of solving practical problems in real world.

Course Name: C106 COMMUNICATIVE ENGLISH	
C106.1	Apply fundamental knowledge to improve the LSRW skills of I year B.Tech students.
C106.2	To enable the students to communicate with ease.
C106.3	Apply basic knowledge to equip the students with the necessary skills and develop their language prowess.
C106.4	Know about pre-processors, command line arguments and various file operations.
C106.5	How programming can be applied to real math problems.

Course Name: C107 PHYSICS LABORATORY	
C107.1	An ability to understand, explain and use instrumental techniques for intensity pattern analysis.
C107.2	Ability to operate optical equipment like Spectrometer, Polarimeter to find the optical properties like dispersive power, Resolving power and specific rotatory power.



C107.3	Capable of handling screw gauge, vernier caliper and travelling microscope to calculate the required parameters.
C107.4	Acquire basic knowledge about thermal conduction and magnetic field due to a current carrying coil.
C107.5	The students can able to understand the different phenomenon of optics such as interference, polarization that correlates between the theory and practical Students will understand about the thermal conductivity ,magnetism and also the determination of pressure coefficient of air at constant volume.

Course Name: C108	
CHEMISTRY LABORATORY	
C108.1	The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related parameters.
C108.2	Fundamentals and formation of polymers with its properties and engineering applications of polymers such as conducting polymers can be understood.
C108.3	Students are able to Illustrate the practical importance of electrochemistry for solving challenges and design of batteries.
C108.4	This unit implicit the concept of corrosion and insist the students to apply their knowledge for protection of different metals from corrosion.
C108.5	Guide the students to gain the knowledge about the cooling curves, phase diagrams, alloys and their practical importance.

Course Name: C109	
WORKSHOP PRACTICE	
C109.1	To acquire skills in basic engineering practice.
C109.2	To identify the hand tools and instruments.
C109.3	To acquire measuring skills.
C109.4	To acquire practical skills in the trades.
C109.5	To provides the knowledge of job materials in various shops.

SEMESTER - II

Course Name: C110	
MATHEMATICS – II	
C110.1	Apply knowledge of mathematics to solve matrix algebra techniques for practical applications and Curl, Divergence and integration of vectors in vector calculus for many application problems.
C110.2	Identify, formulate, and solve engineering problems like Laplace transform which is a useful technique in solving many application problems and to solve differential and integral equations.
C110.3	Apply formulae and analyze problems of Fourier transform techniques.
C110.4	Determine the Fourier Transform, Fourier Cosine and Sine Transform of elementary functions, properties of transforms and its applications in engineering.
C110.5	Acquire knowledge of matrix algebra technique, vector calculus, Laplace and Fourier Transform which are very much essential to solve the problems occurring in the areas of Engineering and Technology.



Course Name: C111	
MATERIAL SCIENCE	
C111.1	Apply core concepts in Materials Science to solve engineering problems.
C111.2	Knowledgeable of contemporary issues relevant to Materials Science and Engineering.
C111.3	Understand about the ferrites and its application to magnetic materials.
C111.4	Select materials for design and construction.
C111.5	Understand the importance and properties of materials.

Course Name: C112	
ENVIRONMENTAL SCIENCE	
C112.1	Apply fundamental knowledge to understand about the environment.
C112.2	Identify environmental pollution through science.
C112.3	Apply basic knowledge to solve various environmental issues and problems.
C112.4	Ability to consider issues of environment and sustainable development in his personal and professional undertakings.
C112.5	Provides a comprehensive knowledge in environmental science, environmental issues and the management from an interdisciplinary perspective.

Course Name: C113	
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	
C113.1	Will gain basic knowledge about magnetic and electrical circuits, single phase and three phase power measurement and the operating principles of stationary and rotating machines.
C113.2	Will gain basic knowledge on instruments for measurements, communication systems and network models.
C113.3	Student will be able know Non-Conventional Energy Systems.
C113.4	Student will be able to know types Metal Joining.
C113.5	Students can able to gain skills about construction and building components provided with various principles and also about various engine, Energy & joints.

Course Name: C114	
ENGINEERING THERMODYNAMICS	
C114.1	Apply knowledge of mathematics, science and engineering to understand the basics of the thermodynamic principles and establish the relationship of these principles to thermal system behaviours.
C114.2	Design and conduct experiment, as well as to analyze and develop methodologies for predicting the system behaviour and understand the importance of laws of thermodynamics applied to energy systems.
C114.3	Identify and analyze role of refrigeration and heat pump as energy systems and develop an intuitive understanding of underlying physical mechanism and a mastery of solving practical problems in real world.
C114.4	The student will able to analyse the laws of motion for rigid bodies.
C114.5	The student will able to analyse the effects of forces acting on the bodies in practical situation.



Course Name: C115	
COMPUTER PROGRAMMING	
C115.1	Know concepts in problem solving.
C115.2	To do programming in C language.
C115.3	To write diversified solutions using C language.
C115.4	To know about structures, pointers and its manipulation.
C115.5	Have a deeper knowledge on the evolution of computers, components and its applications, have an awareness of internet, role of information technology, word processing and worksheets.

Course Name: C116	
COMPUTER PROGRAMMING LABORATORY	
C116.1	Know concepts in problem solving.
C116.2	To do programming in C language.
C116.3	To write diversified solutions using C language.
C116.4	To solve problems of arithmetic and logical expressions.
C116.5	Can develop programs for searching and sorting using arrays and pointers.

Course Name: C117	
ENGINEERING GRAPHICS	
C117.1	Perform freehand sketching of basic geometrical constructions and multiple views of objects.
C117.2	Project orthographic projections of lines and plane surfaces.
C117.3	Draw projections and solids and development of surfaces.
C117.4	Visualize and to project isometric and perspective sections of simple solids.
C117.5	Students will be able to draw orthographic projections and isometric projections.

Course Name: C118	
BASIC ELECTRICAL AND ELECTRONICS LABORATORY	
C118.1	Know about basic electrical tools, applications and precautions.
C118.2	Perform different types of wiring used in domestic and industrial applications.
C118.3	Measurements of voltage and phase using CRO, basic operation and applications of devices such as PN junction diode and transistor.
C118.4	Understand the functions and application of basic logic gates and flip flops.
C118.5	Gain knowledge in domestic wiring and application of electronics device in the field of electrical engineering.

Course Name: C119	
NSS / NCC	
C119.1	To create awareness in social and environmental issues.
C119.2	To participate in relief and rehabilitation work during natural calamities.
C119.3	To develop some proposals for local slum area development and waste disposal.
C119.4	To create team work among students and produce efficient results.
C119.5	The students were taught to operate scientific instruments or advanced software.



SEMESTER - III

Course Name: C201 FOURIER SERIES AND PARTIAL DIFFERENTIAL EQUATIONS	
C201.1	How to solve the given standard partial differential equations.
C201.2	The physical significance of Fourier series techniques in solving one, two dimensional heat flow problems and one dimensional wave equations.
C201.3	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.
C201.4	Understand Fourier series in solving one and two dimensional heat equations.
C201.5	Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems.

Course Name: C202 INTRODUCTION TO FOOD PROCESSING	
C202.1	Be aware of the different methods applied to processing foods.
C202.2	Be able to understand the traditional and modern methods of large scale food processing.
C202.3	Know the importance of food hygiene and waste disposal.
C202.4	Understand the significance of food processing and the role of food and beverage industries in the supply of foods.
C202.5	Evaluate the food hygiene practices in food industries.

Course Name: C203 FOOD PROCESS CALCULATIONS	
C203.1	Understand the basic and fundamental calculation in food processing.
C203.2	Use the stoichiometric principles for the material balance in a process industry.
C203.3	Find the energy balance and enthalpy changes for a system.
C203.4	Apply material balance for different unit operations.
C203.5	Examine energy balance calculations for food process operations.

Course Name: C204 FOOD MICROBIOLOGY	
C204.1	Be able to understand and identify the various microbes associated with foods and food groups.
C204.2	Be able to understand and identify the role of these microbes in food spoilage, food preservation.
C204.3	Understand the role of pathogens in food borne infections
C204.4	Understand the methods used to detect pathogens in foods.
C204.5	Distinguish food borne diseases and intoxication caused by microorganisms.



Course Name: C205	
PRINCIPLES OF FLUID MECHANICS	
C205.1	Able to get a basic knowledge of fluids in static, kinematic and dynamic equilibrium.
C205.2	Gain the knowledge of the applicability of physical laws in addressing problems in hydraulics.
C205.3	Implement the working and calculations on flow measurement devices.
C205.4	Determine the type of flow and measure the rate of flow in channels
C205.5	Assess the working principles of pumps and its application.

Course Name: C206	
FOOD CHEMISTRY	
C206.1	Be able to understand and identify the various food groups; the nutrient components (macro and micro), proximate composition.
C206.2	Be able to understand and identify the non-nutritive components in food, naturally present.
C206.3	Understand and use effectively, food composition tables and databases.
C206.4	Grasp the functional role of food components and their interaction in food products in terms of colour, flavour, texture and nutrient composition
C206.5	Recognize the role of various food colourants and additives in foods.

Course Name: C207	
FOOD MICROBIOLOGY LABORATORY	
C207.1	Able to get a basic knowledge on complete understanding of isolation, characterization of various microbes associated with foods and food groups.
C207.2	Familiarize with microbiological techniques for the study of foods.
C207.3	Better understanding of methods to detect pathogens in foods.
C207.4	Inoculate, isolate and identify the microorganism from both liquid and solid samples.
C207.5	Understand the principles of cleaning and disinfection in food safety.

Course Name: C208	
FOOD CHEMISTRY LABORATORY	
C208.1	Better understanding the physical and chemical properties of food. Familiarize in precipitation of casein and gelatin of starch.
C208.2	Understanding the food groups, constituents of food, energy from food
C208.3	Exposing to nutritional assessment, food constituents and their daily dietary allowances
C208.4	Apply the method of determining the natural pigments from foods.
C208.5	Analyze the refractive index of various fats and oils.



Course Name: C209 FLUID MECHANICS AND MACHINERY LABORATORY	
C209.1	Provide the students with a solid foundation in fluid flow principles.
C209.2	Able to understand measurement of coefficient of discharge of fluid by various flow measuring devices.
C209.3	Provide the students knowledge in calculating performance analysis in turbines and pumps and can be used in power plants.
C209.4	Able to understand to analyze practical problems in all power plants and chemical industries
C209.5	Given the required flow rate and pressure rise, select the proper pump to optimize the pumping efficiency.

SEMESTER - IV

Course Name: 210 PROBABILITY AND STATISTICS	
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.

Course Name: C211 FOOD ANALYSIS	
C211.1	Understand the principles behind analytical techniques in food analysis.
C211.2	Know the methods of selecting appropriate techniques in the analysis of food products.
C211.3	Appreciate 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.
C211.4	Familiarize with the current state of knowledge in food analysis.
C211.5	Apply the concepts of analytical instruments in testing food quality.

Course Name: C212 FUNDAMENTALS OF HEAT AND MASS TRANSFER	
C212.1	Understand the basic laws of heat and mass transfer phenomena.
C212.2	Design heat and mass transfer equipments.
C212.3	Account for the consequence of heat transfer in thermal analyses of engineering systems.
C212.4	Evaluate heat transfer coefficients for natural convection, forced convection inside ducts and exterior surfaces.



C212.5	Analyze heat exchanger performance by using the method of log mean temperature difference and heat exchanger effectiveness.
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Course Name: C213	
NUTRITIONAL BIOCHEMISTRY	
C213.1	Chemical structures and chemical properties of macro- and micronutrients.
C213.2	Processes involved in digestion and absorption of macro- and micronutrients.
C213.3	Major pathways for metabolism of nutrients and key mechanisms regulating these pathways.
C213.4	Essential functions of nutrients in human cells and tissues.
C213.5	Pathologies associated with nutrient deficiencies, nutrient toxicities, and with common metabolic disorders.

Course Name: C214	
THERMODYNAMICS	
C214.1	Apply various laws of thermodynamics to various processes and real systems.
C214.2	Apply the concept of Entropy, Calculate heat, work and other important thermodynamic properties for various ideal gas processes.
C214.3	Understand thermodynamic property relations and their application to fluid flow, power generation and refrigeration processes.
C214.4	Understand thermodynamic property relations and their application to fluid flow, power generation and refrigeration processes.
C214.5	Examine the thermodynamic description of microbial growth in foods and product evaluation.

Course Name: C215	
UNIT OPERATIONS FOR FOOD PROCESSING	
C215.1	Understand the principles of separation methods used in the process industry.
C215.2	Gain the knowledge on different equipment developed for separation.
C215.3	Acquire the concept of crystallization and distillation
C215.4	Demonstrate the filtration, sedimentation and centrifugal separations.
C215.5	Estimate the energy and power requirement for the different size reduction operations.

Course Name: C216	
FOOD ANALYSIS LABORATORY	
C216.1	Better understanding in analysis of foods and food products for chemical components.
C216.2	Knowing standards for food products.
C216.3	Obtain knowledge of adulterants in foods.
C216.4	Analyze the various constituents in foods.
C216.5	Choose suitable instruments and test different food samples.



Course Name: C217	
UNIT OPERATIONS LABORATORY	
C217.1	Have knowledge on the basic principles of chemical engineering and its applications.
C217.2	Be able to apply the skill of material balance and energy balance in unit operations unit process.
C217.3	Describe and demonstrate the equipments for various unit operations.
C217.4	Estimate the energy requirement for grain milling operations.
C217.5	Propose solutions in identifying suitable equipment for food process operations.

Course Name: C218	
NUTRITIONAL BIOCHEMISTRY LABORATORY	
C218.1	Chemical structures and chemical properties of macro- and micronutrients.
C218.2	Processes involved in digestion and absorption of macro- and micronutrients.
C218.3	Major pathways for metabolism of nutrients and key mechanisms regulating these pathways.
C218.4	Essential functions of nutrients in human cells and tissues.
C218.5	Pathologies associated with nutrient deficiencies, nutrient toxicities, and with common metabolic disorders.

Course Name: C219	
PHYSICAL EDUCATION	
C219.1	Physical education majors demonstrate understanding of how individuals learn and develop and can provide opportunities that support students physical, cognitive, social and emotional development.
C219.2	Physical education majors demonstrate understanding of individual and group motivation and behaviour by creating safe learning environments that encourage positive social interaction, active engagement in learning and self-motivation.
C219.3	To create team work among students and produce efficient results.
C219.4	The students were taught to operate advanced playing kits.
C219.5	To motivate the students to prepare the professional and scientific reports.

SEMESTER - V

Course Name: C301	
FOOD ADDITIVES	
C301.1	To understand the principles of chemical preservation of foods.
C301.2	To understand the role of different food additives in the processing of different foods and their specific functions in improving the shelf life, quality, texture and other physical and sensory characteristics of foods.
C301.3	To know the regulations and the monitoring agencies involved in controlling the safer use of additives in foods.
C301.4	Distinguish the characteristics of additives and their specific use in foods.
C301.5	Development of various instant food mixes by addition of preservatives within the permissible limits.



Course Name: C302 ENZYME AND FERMENTATION TECHNOLOGY	
C302.1	Understand the display the instructive and comprehensive current knowledge of enzyme technology and fermentation.
C302.2	Explain the enzyme mechanisms and kinetics, production and recover.
C302.3	Categorize enzymes, including the ones produced through the recombinant method and various reactors in food technology.
C302.4	Identify suitable enzymes for food processing.
C302.5	Select appropriate reactors for fermentation.

Course Name: C303 REFRIGERATION AND COLD CHAIN MANAGEMENT	
C303.1	Demonstrate the operations in different Refrigeration & cold storage systems.
C303.2	Design Refrigeration & cold storage systems.
C303.3	Design the cold chain management system.
C303.4	Apply the knowledge of refrigeration and air conditioning in persevering foods using domestic and industrial refrigeration systems.
C303.5	Choose appropriate refrigerated transport facilities for ensuring the product quality.

Course Name: C304 FOOD PROCESSING AND PRESERVATION	
C304.1	Understand the principles of food processing and preservation.
C304.2	Understand 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.
C304.3	Familiarize with the recent methods of minimal processing of foods and understand the materials and types of packaging for foods.
C304.4	Understand the operations and features of different non-thermal processing techniques and applying to improve the shelf life of product
C304.5	Apply the principle of advanced novel techniques in food processing industries.

Course Name: C305 ELECTIVE - I PULSE AND OIL SEED TECHNOLOGY	
C305.1	Be able to understand and identify the specific processing technologies used for pulses and oil seeds and the various products derived from these materials.
C305.2	Understand the application of scientific principles in the processing technologies specific to the materials.
C305.3	Grasp the changes in the composition of foods with respect to the type of processing technology used.
C305.4	Understand the composition and nutritional quality of pulses and oil seeds.
C305.5	Analyse the different processing methods of fats and oils.



Course Name: C306	
ELECTIVE II	
FOOD PROCESS EQUIPMENT DESIGN	
C306.1	Ability to design, fabricate and operate processing equipments.
C306.2	Analyze the material properties for the design process equipments.
C306.3	Select the suitable products and materials for designing pressure vessels, heat exchangers and evaporators.
C306.4	Develop design parameter for the support accessories of processing equipments.
C306.5	Appraise the performance of heat exchangers, evaporators and dryers.

Course Name: C307	
FOOD PROCESSING AND PRESERVATION LABORATORY	
C307.1	Ability to select the specific preservation technology suitable for a specific food.
C307.2	Ability to process the different categories of food.
C307.3	Assess the moisture content and drying rate of fruits and vegetables.
C307.4	Evaluate the efficiency of different types dryers for the food materials.
C307.5	Assess the quality of foods by applying novel processing methods.

Course Name: C308	
ENZYME AND FERMENTATION TECHNOLOGY LABORATORY	
C308.1	Familiar in the enzymes formation and their usage in food technology.
C308.2	Gain more knowledge in fermentation process in food technology.
C308.3	Select suitable microbial culture for fermentation process.
C308.4	Analyse the microbiological quality control in food fermentation process.
C308.5	Select appropriate fermenters for fermentation process.

Course Name: C309	
GENERAL PROFICIENCY-I	
C309.1	Make effective presentations.
C309.2	Participate confidently in Group Discussions.
C309.3	Attend job interviews and be successful in them.
C309.4	Develop adequate Soft Skills required for the workplace.
C309.5	Improve verbal and numerical aptitude.

SEMESTER - VI

Course Name: C310	
FOOD PROCESS ENGINEERING	
C310.1	Understand the importance of material properties to the texture of food.
C310.2	Importance of thermal processing equipment, Milk pasteurization, Canning operations, Quality considerations and process optimization, Shelf life studies, Validation of heat processes.
C310.3	Understand the importance of Water binding and drying in food processing and preserving food materials.
C310.4	Able to know the types of freezers used in low temperature for food processing



C310.5	Analyze the types extrusions, cookers, evaporators and heating used in food processing.
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Course Name: C311 BAKING AND CONFECTIONERY TECHNOLOGY	
C311.1	Understand the basics of the types of baking and the ingredients needed for baking.
C311.2	Gain the details on the equipment needed in the baking industry.
C311.3	Acquire the knowledge on the various process involve in making breads.
C311.4	Analyse the materials required for making cakes, cookies and gain knowledge on manufacturing of confectionary products.
C311.5	Assess the standards and quality control for bakery and confectionery products.

Course Name: C312 FRUITS AND VEGETABLE PROCESSING TECHNOLOGY	
C312.1	Better understanding of the concepts of physiological characteristics of fruits and vegetables.
C312.2	Better insight about fruit losses during storage and ways to prevent it.
C312.3	Thorough Knowledge and understandings of the specific processing technologies used for different foods and the various products derived from these materials.
C312.4	Participants will understand the process involved in freezing and dehydration of fruits and vegetables, process involved in canning and preserving of juices.
C312.5	Apply minimal processing and fermentation methods to produce value added products from fruits and vegetables.

Course Name: C313 ELECTIVE III CEREAL TECHNOLOGY	
C313.1	Be able to understand and identify the specific processing technologies used for cereals.
C313.2	Understand the application of scientific principles in the processing technologies specific to the materials.
C313.3	Analyse the composition of cereals and their nutritional importance.
C313.4	Create the competence in processing of millets and their products.
C313.5	Apply the production process for different types of baked and extruded products.

Course Name: C314 ELECTIVE IV FOOD PLANT LAYOUT	
C314.1	Apply the knowledge to design projects for setting up a Food Processing Industry.
C314.2	Development of the pilot layout and implement quantitative analysis for plant layout and practical layouts.
C314.3	Construct project profile analysis and prepare project report.
C314.4	Design and estimate the various services and utilities required for the food plant layout.
C314.5	Demonstrate practical layout model of food plant and its maintenance.



Course Name: C315	
FRUITS AND VEGETABLE PROCESSING LABORATORY	
C315.1	Know about the ways by which squash, pies, ketchup jams, pickles can be prepared and preserved.
C315.2	Formulate the production process of ready to serve beverages.
C315.3	Implement dehydration methods to produce dehydrated fruits and vegetables.
C315.4	Demonstrate the production of fermented products like pickles, sauerkraut from fruits and vegetables.
C315.5	Examine the quality of various fruit and vegetable based products.

Course Name: C316	
BAKING AND CONFECTIONERY TECHNOLOGY LABORATORY	
C316.1	Know the detail on toffees, biscuits, breads and sugar boiled confectionaries can be prepared.
C316.2	Evaluate the dough characteristics for the preparation of bakery products.
C316.3	Analyse different types of bakery and confectionery products and their quality parameters.
C316.4	Assess the preparation of sugar confectionary products.
C316.5	Apply baking skills and understand the scope of baking industry.

Course Name: C317	
GENERAL PROFICIENCY – II	
C317.1	Make effective presentations.
C317.2	Participate confidently in Group Discussions.
C317.3	Attend job interviews and be successful in them.
C317.4	Develop adequate Soft Skills required for the workplace.
C317.5	Apply the logical reasoning skills for solving problems.

SEMESTER - VII

Course Name: C401	
DAIRY PROCESS TECHNOLOGY	
C401.1	Understand the process of receiving and handling the milk.
C401.2	Perform quality control tests/lab tests/adulteration tests for milk.
C401.3	Perform CIP of tanks and utensils. Milk / milk products processing.
C401.4	Design packaging & preservation of milk and milk products.
C401.5	Plan and maintain storage sanitation and effluent treatment in milk processing industry.

Course Name: C402	
FOOD SAFETY, QUALITY AND REGULATION	
C402.1	Thorough Knowledge of food hazards, physical, chemical and biological in the industry and food service establishments.
C402.2	Awareness on regulatory and statutory bodies in India and the world.



C402.3	Appreciate the relationship between food, nutrition and health.
C402.4	Acquire knowledge on certification.
C402.5	Execute the food inspection procedures to evaluate the food quality.

Course Name: C403	
FOOD PACKAGING TECHNOLOGY	
C403.1	The different types of materials and media used for packaging foods.
C403.2	Hazards and toxicity associated with packaging materials and laws, regulations and the monitoring agencies involved food safety, labelling of foods.
C403.3	Methods of packaging, shelf life and food factors affecting packaging.
C403.4	Select suitable packaging materials for the extension of shelf life of food products.
C403.5	Analyze the testing and labeling regulatory requirements with respect to food packaging.

Course Name: C404	
ELECTIVE V SPECIALITY FOODS	
C404.1	Understand the benefits of various Nutritional and healthy foods.
C404.2	Able to understand the various specialty foods.
C404.3	Examine the functions of speciality foods based on genetics.
C404.4	Formulate therapeutic foods and judge their performance.
C404.5	Develop specific consumer oriented foods.

Course Name: C405	
ELECTIVE VI DOWNSTREAM PROCESSING	
C405.1	Define the fundamentals of downstream processing for product recovery.
C405.2	Understand the requirements for successful operations of downstream processing.
C405.3	Describe the components of downstream equipment and explain the purpose of each equipment.
C405.4	Apply principles of various unit operations used in downstream processing and enhance problem solving techniques.
C405.5	Create the final product formulation and its operations.

Course Name: C406	
TESTING OF PACKAGING MATERIALS LABORATORY	
C406.1	On the completion of the course, the students will able to get experience on testing food packaging materials to assure quality of foods.
C406.2	Select suitable packaging materials for perishable and non-perishable foods.
C406.3	Demonstrate a testing and properties of packaging materials for its regulatory requirements for raw and processed foods.
C406.4	Analyze the textural properties of packaging material and food packed inside the packaging materials.
C406.5	Evaluate the quality of packing materials using latest instruments.



Course Name: C407 DAIRY PROCESS TECHNOLOGY LABORATORY	
C407.1	On the completion of the course, the students will able to get experience on dairy process technology.
C407.2	Analyze the presence of macro components in milk and detect the adulterants in milk.
C407.3	Find the sterilization efficiency of milk.
C407.4	Understand the process of preparation of dairy products.
C407.5	Analyze the quality of various dairy products.

Course Name: C408 INDUSTRIAL VISIT/TRAINING	
C408.1	Learn field experience and hands on training in food industry.
C408.2	Identify problems faced by the food industry.
C408.3	Find solutions to solve the problems identified in the industry.
C408.4	Understand the processes and man power management in food industry.
C408.5	Acquire skills in maintaining a food industry.

Course Name: C409 PROJECT WORK-I	
C409.1	On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.
C409.2	Formulate a real world problem in the food processing sector, identify the requirement and develop project.
C409.3	Identify technical ideas, strategies and methodologies to find solution to the proposed project.
C409.4	Utilize new tools and techniques that contribute to obtain solution to the project.
C409.5	Prepare report and present oral demonstrations.

SEMESTER - VIII

Course Name: C410 PROFESSIONAL ETHICS	
C410.1	Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.
C410.2	Articulate engineering ethics theory with sustained lifelong learning.
C410.3	Adopt a good character and follow high professional ethical life.
C410.4	Confront and resolve moral issues occurred during technological activities.
C410.5	Resolve moral and ethical problems through exploration and assessment by established experiments.



Course Name: C411 PROCESS ECONOMICS AND INDUSTRIAL MANAGEMENT	
C411.1	Teach principles of cost estimation, feasibility analysis, management, organization and quality control that will enable the students to perform as efficient managers.
C411.2	Demonstrate the organizational structure and concepts of management.
C411.3	Analyze the cost economics in food industry.
C411.4	Justify the investment, profit and alternate policies.
C411.5	Evaluate the annual report and performance analysis and implement the economic and operations management quality control.

Course Name: C412 MEAT, FISH AND POULTRY PROCESSING TECHNOLOGY	
C412.1	Understand and identify the specific processing technologies used for meat and such foods and the various products derived from these materials.
C412.2	Grasp the changes in the composition of foods with respect to the type of processing technology used.
C412.3	Assess the nutritive value, processing and quality parameters of meat and its products.
C412.4	Apply the appropriate processing and preservation methods for fish and its products.
C412.5	Assess the nutritive value, processing and quality parameters of poultry, egg and its products.

Course Name: C413 ELECTIVE VII STORAGE ENGINEERING	
C413.1	Ability to understand the Processing and different storage techniques.
C413.2	Ability to identify suitable equipment for fruit and vegetable processing.
C413.3	Design cold storage structures and estimate the cooling load.
C413.4	Understand the effect of gas composition on shelf life of food products and design the controlled atmosphere storage structures.
C413.5	Analyze the parameters for hypobaric storage.

Course Name: C414 ELECTIVE VIII EMERGING TECHNOLOGIES IN FOOD PROCESSING	
C414.1	Be able to understand and identify the different recent processing technologies and their application.
C414.2	Understand the application of scientific principles in the processing food technologies specific to the materials.
C414.3	Understand the effect of high pressure processing on microbial inactivation of foods.
C414.4	Perceive the principle of pulsed electric field and analyse the impact of pulsed electric field processing for both solid and liquid foods.
C414.5	Apply non thermal and novel technologies for inactivation of microorganisms and improve the food quality.



Course Name: C415	
PROJECT WORK - II	
C415.1	Students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.
C415.2	Formulate a real world problem in the food processing sector, identify the requirement and develop project.
C415.3	Identify technical ideas, strategies and methodologies to find solution to the proposed project.
C415.4	Utilize new tools and techniques that contribute to obtain solution to the project.
C415.5	Prepare report and present oral demonstrations.



A handwritten signature in black ink, appearing to read "D. Tiroutchelvame".

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