

Session: 2022-23

Name of College:	School of Applied and Life Sciences
Name of Department:	DEPARTMENT OF FOOD TECHNOLOGY
Program Name:	M.Sc. Food Technology
Program Code:	33

Program Educational Objectives- PEO, Program Specific Outcomes- PSO, Program Outcomes-PO, Course Outcomes-CO

Program Educational Objectives (PEO)

PEO-1	Knowledge of advanced specific subjects as per need of food industry, processing sectors and research and development
PEO-2	Create new options with the aim of fulfilling the demands of industry and services sectors.
PEO-3	Designed new techniques and process of food products for research, development and entrepreneurship
PEO-4	Create lifelong ethical learning and prepare for competitive exams like NET GATE and others

Program Outcomes-(PO)

PO-1	Understand and apply the knowledge of advance food technology for specialization to the solution of problems related to industry or society.
PO-2	Design& develop solutions for scientific problems with the help of computational/ analytical/statistical techniques for consideration of processing industry, society and environment.
PO-3	Post graduates will be able to use research-based knowledge and research methods including design of experiments, analysis and interpretation of data for processing, manufacturing entrepreneurship and project work.
PO-4	Create, select, and apply appropriate techniques, resources, and modern scientific and IT tools for societal and environmental contexts.
PO-5	Inculcate human values, communication skills& ethical principle in new food design for the society and environment.
PO-6	Develop presentation skills and confidence while working individually and as a team by participation in seminar and other group activities.
PO-7	Construct and perform laboratory work as per standards of industry for determination of quality and quantity of nutrients.

Program Specific Outcomes (PSO)

PSO-1	Apply Principles of microbiology, packaging, post-harvest technology and waste management
PSO-2	Analyse nutrients and manage food quality of various food products
PSO-3	Formulate environment friendly innovative food products

PO-4

Develop research strategies and acquire entrepreneurial skills in the field of food science and technology

Semester- 1

Course Name: Food Chemistry and Applied Nutrition

Course Code (CC): TMFT-101

TMFT-101-CO-1	Construct relationship between food Chemistry and Food Technology for application in industry.
TMFT-101-CO-2	Familiarize with structure, composition and properties of water, carbohydrates, lipids etc. for better use in industry.
TMFT-101-CO-3	Assess basic knowledge of antioxidant, food additive, pigments etc. for creating awareness in society about their uses and legality.
TMFT-101-CO-4	Analyse different type of food groups their RDA, Food ethics and role of BMI in nutritional assessment.
TMFT-101-CO-5	Construct new fundamental phenomenon with their team about anthropometric assessment associated with sources, function and deficiency of different nutrient.
TMFT-101-CO-6	Apply nutritional information on food packaging and designing of different food project. Student will able to compare different calories and modify their daily diet. This also helps them to communicate this practice in mass level for developing healthy life practices in society.

Semester- 1

Course Name: Food Chemistry and Applied Nutrition Lab

Course Code (CC): TMFT-101

PMFT-101-CO-1	Identify different food samples for presence of sugar and its type which help in modifying diet of patients dealing with various health issues.
PMFT-101-CO-2	Identify different food samples for presence of protein and its type which help in modifying diet of patients dealing with various health issues.
PMFT-101-CO-3	Analyse effect of different time, Ph and other factors on enzyme activity.
PMFT-101-CO-4	Identify different type of browning in food which help in estimating quality of food both at industrial and domestic purpose
PMFT-101-CO-5	Apply different quality evaluation methods of food for estimating food quality at industrial level.

Semester- 1

Course Name: Food Engineering

Course Code (CC): TMFT-102

TMFT-102-CO-1	Acquire and apply knowledge of engineering properties of food in equipment design.
TMFT-102-CO-2	Apply knowledge of aerodynamic and hydrodynamic properties in separation process.
TMFT-102-CO-3	Analyze different drying method and heat transfer and apply these principle in solving of design problems.
TMFT-102-CO-4	Implement application of ultra-filtration, reverse osmosis and different flow membrane processes and their uses in food industry.
TMFT-10- CO-5	Assess mass transfer process and its application in food processing.

Semester- 1

Course Name: Principles of Food Processing

Course Code (CC): TMFT-103

TMFT-103-CO-1	Gain knowledge about food processing and food preservation methods.
TMFT-103-CO-2	Understand the basic steps in thermal processing- blanching, pasteurization, sterilization, canning, UHT processing and extrusion cooking.
TMFT-103-CO-3	Identify different processing and preservation techniques of food.
TMFT-103-CO-4	Appraise about the microwave and different cooking methods applied in microwave i.e. microwave blanching, sterilization and finish drying.
TMFT-103-CO-5	Examine and observe different techniques in food processing like pulse electric field, ohmic heating, IR heating, inductive heating and pulsed X-rays.
TMFT-103-CO-6	Assess Nanotechnology and Ultrasonic processing techniques in food processing.

Semester- 1

Course Name: Principles of Food Processing Lab

Course Code (CC): PMFT-103

PMFT-103-CO-1	Develop knowledge about food processing and food preservation methods.
PMFT-103-CO-2	Appraise the basic steps in thermal processing- blanching, pasteurization, sterilization, canning, UHT processing and extrusion cooking.
PMFT-103-CO-3	Examine the handling of different processing instruments.
PMFT-103-CO-4	Recommend appropriate techniques used during preparation and preservation of foods.

Semester- 1

Course Name: Food Enzymes & Biotechnology	
Course Code (CC): TMFT-104	
TMFT-104-CO-1	Understand the central dogma of life system, DNA replication, Transcription, Translation and enzymes involved in these processes.
TMFT-104-CO-2	Understand the role of the enzyme in food production like cheese, juice, baking, meat processing, egg processing, etc.
TMFT-104-CO-3	Illustrate about genetic engineering and its application in genetically modified food and crops production.
TMFT-104-CO-4	Comprehend about the introduction and history of biotechnology and its scopes in agriculture, medicinal, agriculture, food and environment.
TMFT-104-CO-5	Classification and nomenclature of enzymes along with isolation, purification, and large scale production, mechanisms of enzyme action, Coenzymes and cofactor, structure and function, MM equation, kinetics.
TMFT-104-CO-6	Appraise about mechanism of allosteric enzymes, enzyme inhibition, feedback inhibition, immobilization of enzyme and its industrial.

Semester- 1

Course Name: Food Enzymes & Biotechnology Lab	
Course Code (CC): PMFT-104	
PMFT-104-CO-1	Demonstrate enzyme activity for application in bakery product, starch, protein, meat and cheese
PMFT-104-CO-2	Apply the analytical knowledge ELISA and gel electrophoresis techniques for evaluating enzyme and protein activity
PMFT-104-CO-3	Inculcate the knowledge of activity of enzyme in food products
PMFT-104-CO-4	Design food biotechnological analytical problems based on advanced technology.

Semester- 1

Course Name: Instrumentation and Analytical Techniques	
Course Code (CC): TMFT-105	
TMFT-105-CO-1	Understand the basic principles of analytical techniques as chromatography, spectroscopy, microscopy and immunoassay.
TMFT-105-CO-2	Demonstrate the coherent and systematic knowledge of research method to deal with various sophisticated instruments such as HPLC, GLC, SEM, TEM, DSC and FTIR etc.
TMFT-105-CO-3	Illustrate these techniques by utilizing theoretical as well as practical exposure.
TMFT-105-CO-4	Inculcate the ability to solve the food products based scientific analytical problems effectively.

TMFT-105-CO-5	Estimate the appropriate analytical methods for quantification of pigments, amino acids, fatty acids and many other bio-molecules.
TMFT-105-CO-6	Apply advanced technologies for analysis of food products.

Semester- 1

Course Name: Instrumentation and analytical Techniques Lab	
Course Code (CC): PMFT-105	
PMFT-105-CO-1	Demonstrate the various chromatography analysis e.g. TLC, paper and column chromatography for estimation of amino-acids and pigments.
PMFT-105-CO-2	Estimation of food analysts by sophisticated instruments available at research and development labs e.g. HPLC, GLC and flame photometer.
PMFT-105-CO-3	Solve food analytical situations that may help to formulate quality food products and develop product related to food.
PMFT-105-CO-4	Propose new methods for analysis of food for industries and QC labs

Semester- II

Course Name: Food Microbiology	
Course Code (CC): TMFT-201	
TMFT-201-CO-1	Assess the importance of food Microbiology for its sustainable development and use in daily life.
TMFT-201-CO-2	Utilization of historical developments and scientific knowledge of food microbiology.
TMFT-201-CO-3	Compare and examine the reason for spoilage of cereals, legumes, fruits and Vegetable, milk egg etc.
TMFT-201-CO-4	Familiarize with various kind of food born disease and their cause.
TMFT-201-CO-5	Construct relationship between food microbiology and Food preservation for application in industry.
TMFT-201-CO-6	Assess importance of various microorganisms in industries for production of useful product such as vinegar, enzymes soya sauce etc.

Semester- II

Course Name: Food Microbiology Lab	
Course Code (CC): PMFT- 201	
PMFT-201-CO-1	Identify the importance and learn working of various instruments used in microbiology which help their utilization at industrial level

PMFT-201-CO-2	Analyse various food sample for presence of different microbes which help in address various health issue related to food and use it for betterment of Society
PMFT-201-CO-3	Memorize different staining techniques which help in identifying and analysing different microbes.
PMFT-201-CO-4	Apply various instruments and knowledge related to food microbiology for developing products which provide health benefits such as curd, yoghurt etc. at industrial level.

Semester- II

Course Name: Food Packaging Technology	
Course Code (CC): TMFT-202	
TMFT-202-CO1	Understand the basic principle of food packaging and their application in industry.
TMFT-202-CO2	Classify the various packaging materials and its designing aspects for packaging of food product.
TMFT-202-CO3	Appraise about various packaging laws and regulations for safety of environment, storage, handling and distribution.
TMFT-202-CO4	Learn testing and regulatory aspects of food packaging.
TMFT-202-CO5	Familiarize with various packaging equipment and machinery and their industrial application.
TMFT-202-CO6	Assess importance of various modern packaging system, biodegradable materials, legislative issues etc. and their application in food industry.

Semester- II

Course Name: Food Packaging Technology Lab	
Course Code (CC): PMFT-202	
PMFT-202-C0-1	Analyse physical/mechanical properties of food packaging material.
PMFT-202-C0-2	Analyse Transmission rate through packaging material.
PMFT-202-C0-3	Demonstrate packaging material and their properties for efficient use in industry.
PMFT-202-C0-4	Acquire knowledge of packaging method and study of shelf-life.

Semester- II

Course Name: Technology of Meat, Poultry and Fish Processing	
Course Code (CC): TMFT-203	

TMFT-203-CO-1	Understand the scope of meat industry and discuss the chemistry, microbiology and safety behind the meat muscle.
TMFT-203-CO-2	Learn the layout of modern abattoirs and examine the factors affecting during ante-mortem, slaughtering and post-mortem handling on meat quality.
TMFT-203-CO-3	Assess the knowledge and importance of various preservation techniques and plant hygiene on meat carcass and also study the processing and packaging of different meat products.
TMFT-203-CO-4	Interpret current status of poultry and its by-products processing industry in India and examine the reason for spoilage and study the packaging of poultry products.
TMFT-203-CO-5	Identify and learn the commercial importance, preparation, postharvest preservation techniques of fish processing and its by-products.

Semester- II

Course Name: Technology of Meat, Poultry and Fish Processing Lab

Course Code (CC): PMFT-203

PMFT-203-CO-1	Demonstrate cutting, handling and post-mortem changes on meat quality.
PMFT-203-CO-2	Perform different methods of meat and egg quality evaluation.
PMFT-203-CO-3	Assess the importance of various preservation techniques of meat and shell egg preservation.
PMFT-203-CO-4	Compare and analyse concept of shelf-life studies of processed meat products.

Semester- II

Course Name: Technology of Cereals, Pulses and Oil Seeds

Course Code (CC): TMFT-204

TMFT-204-CO-1	Comprehend about the current status of production and processing of important cereals, pulses and oil seeds crops.
TMFT-204-CO-2	Appraise about structure, types, physical characteristics, processing and products of important cereals, pulses and oil seeds crops.
TMFT-204-CO-3	Implement knowledge of rice and its products in industry.
TMFT-204-CO-4	Recommend processing of corn, wheat their products and by products.
TMFT-204-CO-5	Devise the processing method for legumes and oilseeds.

Semester- II

Course Name: Technology of Cereals, Pulses and Oil Seeds Lab	
Course Code (CC): PMFT-204	
PMFT-204-CO-1	Understand the concept of physicochemical and rheological properties of rice.
PMFT-204-CO-2	Compose knowledge of laboratory skills by determination of gluten content in wheat flour.
PMFT-204-CO-3	Examine the Extraction of oil using expeller and solvent extraction methods.
PMFT-204-CO-4	Recommend the extraction of oil content from different cereals and oil seeds.

Semester- II

Course Name: Computer application in food industry	
Course Code (CC): TMFT-205	
TMFT-205-CO-1	Gain knowledge about importance of computerization in industries.
TMFT-205-CO-2	Understand techniques of CAD/CAM, Robotics and Automation and their application.
TMFT-205-CO-3	Illustrate the importance of Operations Research and mathematical tools for solving problems.
TMFT-205-CO-4	Discuss the CPM- PERT models and apply them to real-life problems.

Semester- II

Course Name: Computer application in food industry Lab	
Course Code (CC): PMFT-205	
PMFT-205-CO-1	Illustrate the fundamental of windows operating system and the basic operations of operating system.
PMFT-205-CO-2	Evaluate the basic concepts of spreadsheets, formulas and shortcut keys.
PMFT-205-CO-3	Create word documents and presentations for an academic and business purposes

Semester- III

Course Name: Advanced Bakery and Confectionery Technology	
Course Code (CC): TMFT-301	

TMFT-301- CO-1	Construct an idea about the trends and status of bakery and confectionery industry in India.
TMFT-301-CO-2	Enhance the advance knowledge of technology used in modified bakery products for different health conditions which is beneficial for society.
TMFT-301-CO-3	Acquire knowledge of the technologies behind bakery products using modern tools.
TMFT-301-CO-4	Attain the knowledge of standards & regulations, quality parameters for sugar, chocolates and other confectionery products.
TMFT-301- CO-5	Develop lifelong learning of technologies (equipment and process) for confectionery product preparations.

Semester- III

Course Name: Advanced Bakery and Confectionery Technology Lab

Course Code (CC): PMFT-301

PMFT-301-CO-1	Acquire knowledge of interpretation and rheological characteristics behind dough and other bakery products such as dough relaxation time, effect of mixing method and time.
PMFT-301-CO-2	Evaluation of various qualities of bakery products
PMFT-301-CO-3	Attain the knowledge of quality parameters for sugar, chocolates and other confectionery products.
PMFT-301-CO-4	Develop lifelong learning of technologies for bakery and confectionery product preparations.

Semester- III

Course Name Post-harvest management of fruits and vegetables

Course Code (CC): TMFT-302

TMFT-302-CO-1	Acquaint with the post-harvest handling technologies of fruits and vegetables to reduce post-harvest losses and their value addition.
TMFT-302-CO-2	Understand the basic concept of ripening, harvesting and handling of fruits and vegetables.
TMFT-302- CO-3	Classify different factors affecting post-harvest losses.
TMFT-302-CO-4	Compare different storage techniques and there application in storage of fruits and vegetables.
TMFT-302-CO-5	Identify physiological post-harvest disorders and methods to prevent them.
TMFT-302-CO-6	Apply concepts gained in handling and transportation of fruits and vegetables.

Semester- III

Course Name: Post-harvest management of fruits and vegetables Lab

Course Code (CC): PMFT-302

PMFT-302- CO-1	Recite morphological features of fruits and vegetables.
PMFT-302-CO-2	Identify different physiological disorder and chilling injury of different fruits.
PMFT-302-CO-3	Construct pre-packaging and storage material for various fruits and vegetables.
PMFT-302 -CO-4	Analyse effect of RQ and chemicals on ripening of fruits and vegetables.

Semester- III

Course Name: Research & Publication Ethics

Course Code (CC): TMFT-303

TMFT-303- CO-1	Recognize the basics of philosophy of science with research ethics.
TMFT-303- CO-2	Familiarize with important issues in research ethics, integrity & scientific misconduct.
TMFT-303-CO-3	Analyze the best practices for publications, publication ethics and identify the predatory publishers & journals.
TMFT-303- CO-4	Demonstrate & use plagiarism software tools, citation databases and research metrics.

Semester- III

Course Name: Technology of Milk and Milk Products

Course Code (CC): TMFT-304

TMFT-304-CO-1	Understand the various components of milk, processing and quality production of milk.
TMFT-304-CO-2	Acquire sound knowledge of drying, fermentation, condensing, evaporation, and agglomeration techniques for some specific dairy products.
TMFT-304-CO-3	Interpret the processing of Ice cream and skim milk powder, butter, cream.
TMFT-304-CO-4	Examine the significance of indigenous milk products.
TMFT-304-CO-5	Formulate product based on probiotics and value added product from whey and butter oil.

Semester- III

Course Name: Technology of Milk and Milk Products Lab	
Course Code (CC): PMFT-304	
PMFT-304-CO-1	Demonstrate the basic biochemical parameters Fat, SNF and specific gravity of milk.
PMFT-304-CO-2	Analyse adulterants in milk and milk products for quality product.
PMFT-304 CO-3	Develop new analytical skills to analyse milk and milk products.
PMFT-304 CO-4	Set up new analytical protocols for finding out contaminants and adulterants for safe supply of milk and milk products.

Semester-III

Course Name: Waste Recycling and Resources Recovery System	
Course Code (CC): TMFT-305	
TMFT-305-CO-1	Knowledge about waste materials and its utilization in the human consumption.
TMFT-305-CO-2	Analyze different technologies or techniques for converting waste material into usable ones.
TMFT-305-CO-3	Illustrate different pollution problem and their solutions.
TMFT-305-CO-4	Reviewing different by-products of dairy, meat and fish industry.
TMFT-305-CO-5	Evaluate aspects of environment related to different waste materials and its utilization in the form of by- products.
TMFT-305-CO-6	Creating different by-products of the food waste material.

Semester-III

Course Name:: Industrial Visit Report & Presentation	
Course Code (CC): PMFT- 306	
PMFT-306-CO-1	Demonstrate the acquired experimental skills for working on a research project
PMFT-306-CO-2	Generate data from various experiments for research output.
PMFT-306-CO-3	Compile all research data for writing research papers, seminars and

	conferences.
PMFT-306-CO-4	Utilize research skills in QC labs, industries and scientific labs.

Semester- IV

Course Name:: Dissertation/ Experimental Training Project	
Course Code (CC): PMFT-401	
PMFT-401-CO-1	Demonstrate the acquired experimental skills for working on a research project.
PMFT-401-CO-2	Generate data from various experiments for research output.
PMFT-401-CO-3	Compile all research data for writing research papers, seminars and conferences.
PMFT-401-CO-4	Utilize research skills in QC labs, industries and scientific labs.

Semester-IV

Course Name:: Seminar/ Workshop	
Course Code (CC): PMFT-402	
PMFT-402-CO-1	Enhancement of presentation skills of students for constructive development of personality.
PMFT-402-CO-2	Grooming communication skills of students for constructing and developing confidence.

Semester- IV

Course Name:: Food Quality System and Management	
Course Code (CC): TMFT-403	
TMFT-403-CO-1	Understand the key concepts related to food quality, safety, manufacturing, hygiene and sanitation practices.
TMFT-403-CO-2	Explain the relationships of food safety and hygienic measures in context with reference to quality of food products.
TMFT-403-CO-3	Have sound understanding of food laws, food safety and food quality management system.
TMFT-403-CO-4	Classify the linkages between the food laws present at national and global level.

TMFT-403-CO-5	Assess the food laws that may vulnerable for export and import of food products.
TMFT-403-CO-6	Manage the safety and hygiene related problems of food industries through various quality management systems and laws that may also helpful for writing, designing and documentation skills at industries level.

Semester- IV

Course Name: Advance Industrial Microbiology	
Course Code (CC): TMFT-404	
TMFT-404-CO-1	Identify the importance of Industrial Microbiology for its sustainable development and use in daily life as well as at industrial level.
TMFT-404-CO-2	Assess importance of various microorganisms in industries for production of useful product such as vinegar, enzymes soya sauce etc.
TMFT-404-CO-3	Apply concept of fermenter design and processing for its better utilization in industry.
TMFT-404-CO-4	Identify various microorganisms for production of important products such as vaccine, enzymes etc. at industrial level for betterment of society.

Semester- IV

Course Name: Advance Industrial Microbiology Lab	
Course Code (CC): PMFT-404	
PMFT-404-CO-1	Analyse various food sample for presence of different microbes which help in address various health issue related to food and use it for betterment of Society.
PMFT-404-CO-2	Differentiate different microbes by utilizing various media, plating technique etc. which help in better utilization and increase safety in industry.
PMFT-404-CO-3	Apply various instrument and knowledge related to food microbiology for developing products which provide health benefits Such as Curd, yogurt etc. at industrial level.
PMFT-404 CO-4	Identifying and analysing different microbes using different Staining techniques.

Semester- IV

Course Name: Food Entrepreneurship and Intellectual Property Rights	
Course Code (CC): TMFT-405	
TMFT-405-CO-1	Relate to various concepts of entrepreneurship.
TMFT-405-CO-2	Identify steps involved in project formulation and execution.

TMFT-405-CO-3	Understand basic concept of intellectual property rights.
TMFT-405-CO-4	Conceptualise code of ethics for food science and technology professionals.
TMFT-405-CO-5	Interpret procedure for registration and licensing.

Semester- IV

Course Name: Statistics	
Course Code (CC): TMFT-406	
TMFT-406-CO-1	Demonstrate an understanding of the fundamental concepts and techniques of modern statistics and their probabilistic foundation.
TMFT-406-CO-2	Adequate knowledge on measurement, scaling techniques, data analysis and hypothesis testing using suitable test of statistical significance.
TMFT-406- CO-3	Statistical analysis of data using Excel, SPSS, Design of Experiment, analysis of variance and applied statistical knowledge to real-life problems related to food technology.