



LOYOLA ACADEMY

DEGREE & PG COLLEGE

OLD ALWAL, SECUNDERABAD - 500 010, TELANGANA, INDIA
(An Autonomous Institution Affiliated to Osmania University)

Re-accredited with 'A' Grade (III Cycle) by NAAC

A Catholic Christian Minority Institution (Co-Education)

A "College with Potential for Excellence" by UGC

www.loyolaacademy.edu.in email: info@loyolaacademy.edu.in Ph: 040-27862363/27860077

SYLLABUS

of

M.Sc. Food Technology and Management

**For the Academic Year
2025-2026**



LOYOLA ACADEMY

DEGREE & PG COLLEGE

OLD ALWAL, SECUNDERABAD - 500 010, TELANGANA, INDIA

(An Autonomous Institution Affiliated to Osmania University)

Re-accredited with 'A' Grade (III Cycle) by NAAC

A Catholic Christian Minority Institution (Co-Education)

A "College with Potential for Excellence" by UGC

www.loyolaacademy.edu.in email: info@loyolaacademy.edu.in Ph: 040-27862363/27860077

SYLLABUS

of

M.Sc. Food Technology and Management


Principal


Dean


Chairman, Board of Studies

For the Academic Year 2025-2026 for the Batch 2025-2027



Index

S.No.	Content	Page No.
1	School of Science – Programme Outcomes	4
2	M.Sc. FI&M Department- Programme Specific Outcomes	5
3	Consolidated Scheme	6
4	Semester I Distribution of courses	7
5	Communicative Competence (AECC-1)	8-9
6	Technology of Food Processing & Preservation (SEC-1)	10-11
7	Food Process Engineering -1 (Core-1)	12-13
8	Technology of Animal based food & food product (Core-2)	14-15
9	Advanced Food Chemistry (Core-3)	16-17
10	Food Microbiology (Core -4)	18-19
11	Advanced Food Chemistry Practical (Core-3)	20
12	Food Microbiology Practical (Core -4)	21
13	Semester II Distribution of courses	22
14	*Computer Applications (AECC-2)	23-24
15	Processing of Plantation Products and Spices (Core-5)	25-26
16	Research Methodology (Core – 6)	27-28
17	Food Process Engineering–II(Core-7)	29-30
18	Instrumental Methods of Food Analysis (Core-8)	31-32
19	Technology of Cereals and Pulses (Core -9)	33-34
20	Basic Food Chemistry (GE)	35-36
21	Food Process Engineering Practical (Core-7)	37
22	Technology of Cereals and Pulses Practical (Core -9)	38
23	Semester- III Distribution of courses	39
24	*Human Values and Professional Ethics (AECC -3)	40-41
25	Tech. of Fermented Foods & Beverages/ Tech. of Sugar confectionery & chocolate processing (DSE-1)	42-45
26	Extrusion Technology (Core-10)	46-47
27	Advances in Food Packaging (Core – 11)	48-49
28	Food Quality systems & Management (Core -12)	50-51
29	Energy Conservation & Auditing (Core-13)	52-53
30	Food Supply & Cold Chain Management (Core- 14)	54-55
31	Adv. Food Packaging Practical (Core – 11)	56
32	Food Quality systems & Management Practical (Core -12)	57
33	Semester- IV Distribution of courses	58
34	Nutraceuticals & Functional Foods / Food Toxicology & Allergens (DSE- 2)	59-62
35	New Food product development (Core – 15)	63-64
38	New Food Product Development Practical (Core – 15)	65
39	Project Work/Industry Internship	66



SCHOOL OF SCIENCE

PROGRAMME OUTCOMES

- PO1: Scientific Knowledge:** Ability to build a strong foundation of knowledge, integrated with the latest developments in science and technology which help students develop critical thinking, reasoning, decision-making in the process of quality education.
- PO2: Problem Analysis:** Identify, formulate and analyze complex scientific problems using the knowledge gained across various streams of science and technology.
- PO3: Effective Communication:** Ability to articulate ideas, communicate effectively using current tools in the field of ICT along with effective report writing and documentation.
- PO4: Development of Skill and Attitude:** Enabling the students with the required skill, right attitude, time management and self-discipline for prominent career in industry, research institutes and for further academic study.
- PO5: Life-Long Learning and Social Responsibility:** Recognize the need and ability to engage in lifelong learning and work effectively as an individual and as a member of diverse team. Students get the ability to act with an informed awareness of issues to participate in civic life through volunteering.



Department of M.Sc. Food Technology and Management

PROGRAMME SPECIFIC OUTCOMES

- PSO1:** Analyze nutrients and determine food quality.
- PSO2:** Formulate environment – friendly, innovative food products
- PSO3.**Acquire skills to establish a food service outlet
- PSO4.**Devise research strategies for empowering and promoting healthy living in the community
- PSO5.**Professionally competent to take up careers in academics. health care and the service industry.
- PSO6: Apply** skill-based knowledge in the food industry
- PSO7.**Acquire entrepreneurial skills in the field of food science.
- PSO8:** Develop comprehensive and analytical skills in food industries and health sectors.

Annexure-I
Loyola Academy Degree & PG College
M.Sc. Food Technology and Management (2025-2026) (Choice-Based Credit System)

Year	Sem	Course-1	Course-2	Course-3	Course-4	Course-5	Course-6	Course-7	Bridge course (Basics of food technology)	Hr/week	Remedial courses/ Bridge courses/ Competitive exam guidance	Credits	
I	I	* Communicative Competence (2) (AECC-1)	Technology of Food Processing & Preservation (2) (SEC-1)	Food Process Engineering-I (4) (Core-1)	Technology of Animal-based food & food products (4) (Core-2)	Advanced Food Chemistry (4+2) (Core-3)	Food Microbiology (4+2) (Core-4)	Course-7	Bridge course (Basics of food technology)	28	8	22	AECC-1 CORE-5 SEC-1 Bridge course-1
I	II	* Computer Applications (2) (AECC-2)	Processing of Plantation Products and Spices (4) (Core-5)	Research Methodology (4) (Core-6)	Food Process Engineering -II (4+2) (Core-7)	Instrumental Methods of Food Analysis (4) (Core-8)	Technology of Cereals and pulses (4+2) (Core-9)	Basic Food Chemistry (2) (GE-1) (for FSN)	-	32	3	26	AECC-1 CORE-5 GE-1
II	III	* Human Values and Professional Ethics (2) (AECC-3)	Tech. of Fermented Foods & Beverages / Tech. of Sugar confectionery & chocolate processing (4) (DSE-1)	Extrusion Technology (4) (Core-10)	Adv. Food Packaging (4+2) (Core-11)	Food Quality systems & Management (4+2) (Core-12)	Energy Conservation & Auditing (4) (Core-13)	Food Supply & Cold Chain Management (4) (Core-14)	-	34	3	28	AECC-1 DSE-1 CORE-5
II	IV	Nutraceuticals and functional foods / Food Toxicology & Allergens (4) (DSE-2)	Nutraceuticals and functional foods / Food Toxicology & Allergens (4) (DSE-2)		New food product development (4+2) (Core-15)		Project work (6)		-	36	1	16	CORE-1 DSE-1 Project-1
Legend		1. Ability Enhancement Compulsory Course (AECC) : 03 2. Generic Elective (GE) : 01 3. Skill Enhancement Course (SEC) : 01 4. Core : 15 5. Discipline-Specific Elective (DSE) : 02 6. Bridge course : 01											
									Total	130		92	

- * Ability Enhancement Compulsory Course (AECC) Marks are not included in CGPA score in the main certificate, but it is compulsory to pass in the examination.
- † GE paper will be offered to the students of M.SC FSN-PG department.
- Bridge course non CGPA is offered to non-food technology students to acquire the knowledge of basics of food technology.



Year-Wise And Semester-Wise Distribution of Courses
Department of M.Sc. Food Technology & Management
First Semester
Academic Year 2025-2026 Batch 2025-2027 (CBCS)

S. No	Part	Subject Code	Title of the Subject	Hours /Week	Duration of Exam (hrs)	Marks			Credits
						Internal	External	Total	
1	I	MFT24101	*Communicative Competence (AECC-1)	2	2	20	30	50	2
2	II	MFT25102	Technology of Food Processing & Preservation (SEC-1)	2	3	20	30	50	2
3	II	MFT13103	Food Process Engineering -1 (Core-1)	4	3	40	60	100	4
4	II	MFT13104	Technology of Animal based food & food products (Core-2)	4	3	40	60	100	4
5	II	MFT13105	Advanced Food Chemistry (Core-3)	4	3	40	60	100	4
6	II	MFT13106	Food Microbiology (Core -4)	4	3	40	60	100	4
PRACTICALS									
7	II	MFT13107	Advanced Food Chemistry (Core-3)	4	3	40	60	100	2
8	II	MFT13108	Food Microbiology (Core -4)	4	3	40	60	100	2
TOTAL				28		280	420	700	22

- *Ability Enhancement Compulsory Course (AECC) marks not included in CGPA score in the main certificate, but it is compulsory to pass in the examination.
- CIA components for internal marks of theory paper: (i) Weekly test: 5M (ii) Mid Sem: 10 M (iii) Prefinal: 16M (iv) Assignment: 2M (v) Viva: 2M (vi) Attendance: 4M
- CIA components for practical Internal marks: (i) Attendance/Record 5M (ii) Practical skill: 10M (iii) Prefinal: 15M





COURSE NAME
COMMUNICATIVE COMPETENCE

Credits: 2
Course Code: MFT24101

Semester: 1
No of Lecture hours: 30

Course Objective:

- English language courses will help students to develop a natural and accurate style of pronunciation.
- English language courses will also improve students' ability to express ideas clearly and confidently in English.

Course Outcome:

CO1: Understand the features of Indian English and its differences from formal expressions, and apply this knowledge in both written and verbal communication. (Knowledge/Comprehension)

CO2: Develop effective verbal and non-verbal communication skills, including rate of speech, pitch, tone, and clarity of voice, to communicate with different audiences. (Application/Analysis)

CO3: Demonstrate presentation skills, including the ability to organise and deliver presentations in different formats, such as informative, persuasive, and demonstrative presentations. (Application/Analysis)

CO4: Apply through skills and techniques required for formal and informal interviews, including creating the right ambience, effective questioning, and active listening, for successful job interviews and group discussions. (Application/Analysis)

CO5: Develop proficiency in functional grammar, including the correct usage of tenses, phonetics, articles, sentence correction, and subject-verb concord, to enhance written and oral communication skills. (Synthesis/Evaluation)

Course Content	Hours Allotted	Pedagogy
Module I: <ul style="list-style-type: none"> Features of Indian English Informal conversation Vs formal expression Verbal and non-verbal communication Barriers to effective communication 	(6) 2 1 1 2	Lecture Method using ICT Tools and chalk and talk
Module II: <ul style="list-style-type: none"> What is Communicative Competence - Oral, Aural, Writing, Reading Rate of speech, Pitch, Tone - Clarity of voice Presentation skills Types of presentation 	(6) 2 2 1 1	Lecture Method using ICT Tools and chalk and talk
Module III: <ul style="list-style-type: none"> Formal and Informal interviews 	(6)	Lecture Method using ICT Tools



<ul style="list-style-type: none"> • Ambience and Polemics • Interview skills and types of interviews • Group discussion • Curriculum Vitae 	<p>1</p> <p>2</p> <p>1</p> <p>1</p>	and chalk and talk
Module IV: <ul style="list-style-type: none"> • Tenses • Articles • Correction of sentences • Subject-verb concord 	<p>(6)</p> <p>2</p> <p>1</p> <p>1</p> <p>2</p>	Lecture Method using ICT Tools and chalk and talk
Module V: <ul style="list-style-type: none"> • Letter writing - Business letter • Analysis of sample letters collected from industry; Email, Fax • Writing a research paper 	<p>(6)</p> <p>2</p> <p>2</p> <p>2</p>	Lecture Method using ICT Tools and chalk and talk

Learning Resources	
1.	Essentials of Business English , Pal, Korlahahi
2.	Basic Communication Skills for Technology , Rutherford
3.	Advanced Communication Skills , Prasad
4.	Business Communication; Theory and Application , Lesikav, Pettit Jr
5.	Business Communication , Madhukar



COURSE NAME
Technology of Food Processing and Preservation

Credits: 2

Course Code: MFT25102(SEC-1)

Semester: I

No of Lecture Hours: 30

Course Objective:

- To understand the methods to increase the shelf-life of food using different preservation techniques.
- To impart knowledge on Low temperature preservation techniques.
- To educate about food additives, enzymes and micro-organisms and their permissible limits.
- To impart knowledge on membrane technology.
- To educate the methods to increase the shelf life of food using different non-thermal preservation techniques.

Course Outcome:

CO1: Students will be able to apply knowledge of high temperature processing methods & principles of preservation in various foods.

CO2: Students will be able to apply knowledge of low temperature processing & preservation techniques in various foods.

CO3: Students will be able to analyse & understand functions of various food additives, enzymes & micro-organism used in food industry

CO4: Students will be able to apply various membrane technologies in food industry.

CO5: Students will be able to implement various preservation techniques for shelf life extension of foods.

Course Content	Hours Allotted	Pedagogy
Module I: Title: Introduction & High Temperature Processing <ul style="list-style-type: none"> • Food preservation and processing – Scope, historical developments, principles • Processing and preservation by heat; <ul style="list-style-type: none"> ○ blanching, pasteurization, sterilization and UHT processing ○ canning, extrusion cooking, dielectric heating ○ Microwave heating, baking, roasting and frying, etc 	(6) 1 5	Lecture Method using ICT Tools and chalk and talk
Module II: Title: : Low-Temperature Processing <ul style="list-style-type: none"> • Processing and preservation by low-temperature- <ul style="list-style-type: none"> ○ refrigeration, freezing, dehydro freezing ○ CA, MA • Processing and preservation by <ul style="list-style-type: none"> ○ Drying– Types of dryers - suitability for different food products. ○ Concentration, evaporation 	(6) 3 3	Lecture Method using ICT Tools and chalk and talk



<p>Module III: Title: Food Additives</p> <ul style="list-style-type: none"> • Preservation by Food additives: types and functions • Permissible limits and safety aspects. • Use and application of: <ul style="list-style-type: none"> ○ Enzymes & Microorganisms in the processing and preservation of foods 	<p>(6) 4 1 1</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>
<p>Module IV: Title: Membrane Technology</p> <ul style="list-style-type: none"> • Membrane technology - Introduction to pressure-activated membrane processes: <ul style="list-style-type: none"> ○ micro- filtration ○ UF ○ NF ○ RO • Industrial applications of Membrane Technology 	<p>(6) 5 1</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>
<p>Module V: Title: New Techniques of Preservation</p> <ul style="list-style-type: none"> • New techniques in food processing • Processing and preservation by non-thermal methods <ul style="list-style-type: none"> ○ Irradiation ○ high pressure, high-intensity light, ○ pulsed electric field, ○ ohmic heating ○ IR heating, inductive heating ○ pulsed X-rays • Hurdle technology • Nanotechnology: Principles and applications in foods 	<p>(6) 1 3 1 1</p>	<p>Lecture Method using ICT Tools and chalk and talk Assignments</p>

Learning Resources	
1.	<i>Food Dehydration</i> , Arsdel WB, Copley MJ & Morgan AI. 1973,
2.	<i>Technology of Food Preservation</i> , Desrosier NW & James N.1977, . 4th Ed.
3.	<i>Introduction to Food Processing</i> , Fellows PJ. 2005, 2 nd Ed
4.	<i>Food Science</i> , Potter NN & Hotchkiss 1997, 5th Ed.



COURSE NAME
Food Process Engineering-I

Credits: 4

Course Code: MFT13103

Semester: I

No of Lecture Hours: 60

Course Objective:

- To impart students with knowledge related to engineering aspects in food technology.
- To introduce in a systematic way the most common food engineering unit operations.
- To design food processes and the equipment needed to carry them out

Course Outcome:

CO1: Students will be able to understand the material and energy balance involved in different food processing operations

CO2: Students will be able to develop skills in defining problems, collecting and analyzing data related to various food processes

CO3: Students will be able to explain about kinetic theory of gases and vapours and its behaviour.

CO4: Students will gain knowledge on concept of thermodynamic properties and processes

CO5: Students will be able to learn about rheological and colligative properties of fluids.

Course Content	Hours Allotted	Pedagogy
Module I: Title: Material Balance & Energy Balance <ul style="list-style-type: none"> • Material Balances: Basic Principles • Problems in: <ul style="list-style-type: none"> ○ Dilution ○ Concentration ○ Dehydration ○ Blending of Food Ingredients 	(12) 3 9	Lecture Method using ICT Tools and chalk and talk
Module II: Title: Energy Balance <ul style="list-style-type: none"> • Energy Balances: Basic Principles – Energy terms • Heat properties of saturated and superheated steam • Problems & Examples in Heat balances 	(12) 3 5 4	Lecture Method using ICT Tools and chalk and talk
Module III: Title: Gases and vapors-I <ul style="list-style-type: none"> • Gases and vapors: definition-equation of state for an ideal and real gases • Ideal gas equation - P.V.T relationship for ideal gases-gas mixture • Thermodynamics: thermodynamic variables- define enthalpy • The relationship between C_p and C_v for gases 	(12) 3 3 3 3	Lecture Method using ICT Tools and chalk and talk
Module IV: Title: Gases and vapors-II <ul style="list-style-type: none"> • P.V.T relationship for ideal gases in thermodynamic process • Changes in thermodynamic properties • Work and Heat associated with thermodynamic processes 	(12) 4 4 4	Lecture Method using ICT Tools and chalk and talk



		chalk and talk
Module V: Title: Rheological & Colligative properties <ul style="list-style-type: none"> • Rheological properties of food materials: <ul style="list-style-type: none"> ○ Rheology – Viscosity – effect of temperature on viscosity ○ Viscosity of gases – brook field viscometer. • Colligative properties and surface tension <ul style="list-style-type: none"> ○ Boiling point elevation- freezing point depression ○ surface tension ○ Cohesion, adhesion and spreading 	(12) 6 6	Lecture Method using ICT Tools and chalk and talk Assignments

Learning Resources	
1.	Food Engineering, Romeo Toledo
2.	Food Engineering Operations, Brennan JG, Butter JR, Corell ND & Lilly AVE. 1990.
3.	Unit Operations of Chemical Engineering. McGraw Hills, Charm SE, McCabe WL, Smith JC & Harriott P. 1993
4.	Introduction to Food Engineering, Singh RP & Heldman DR. 1993



COURSE NAME

Technology of Animal -Based Food and Food Products

Credits: 2

Course Code:MFT13104

Semester: I

No of Lecture Hours: 60

Course Objective:

- To impart knowledge about history, current status of meat industry, to educate on factors influencing quality of egg and poultry meat and nutritive value.
- To impart knowledge on structure, muscle composition, functions and sensory quality of meat and preservation methods, quality control and packaging practices in red meat.
- To impart knowledge on structure, functional quality, processing, microbiology and preservation of seafood.
- To impart knowledge about milk composition, legislation, milk processing techniques, cleaning and sanitation of dairy equipment.
- To impart knowledge about composition and marketing nutritive value dairy products, preservation methods –quality maintenance, packaging and standards.

Course Outcome:

- CO1:** . Be able to understand the status, processing, and importance of avian food sources like eggs and poultry
- CO2:** Be able to apply animal technology that is oriented towards improving production. efficiency, quality, and sustainability based on mastery of animal science including breeding, feed, and processing of meat products.
- CO3:** Be able to understand technology in processing preservation and quality evaluation of seafood and its value-added products
- CO4:** Be able to explain milk processing using drying technology, starting from the principles, processes, and factors that determine quality. Be Able to apply drying technology to dairy products.
- CO5:** Be able to understand technology in processing and preserving dairy products and to evaluate the quality of processed products.

Course Content	Hours Allotted	Pedagogy
Module I: Title: Avian Foods <ul style="list-style-type: none"> • Avian Foods: Egg & Poultry industry in India • classification, composition • nutritive value, grading • Processing, packaging • microbiology, storage • quality characteristics and spoilage factors • Lay-out and design of poultry processing plants • operations. equipment & Plant sanitation • Poultry by-products 	(12) 1 1 1 1 2 2 1 2 1	Lecture Method using ICT Tools and chalk and talk
Module II: Title: : Meat <ul style="list-style-type: none"> • Livestock: Meat production from different sources in India • muscle structure, chemistry, and composition • ante mortem and post-mortem handling • Meat tenderization 	(12) 1 1 1 1	Lecture Method using ICT Tools and chalk and talk



<ul style="list-style-type: none"> Grading, Processing, preservation, packaging microbiology, storage safety, quality characteristics and spoilage factors Meat products – Moisture, IM and dried foods offal handling and inspection; inedible by-product Modern abattoirs and design of facilities - typical layout and features 	<p>2 1 2 1 1 1</p>	talk
<p>Module III: Title: Sea Foods</p> <ul style="list-style-type: none"> Sea Food: Grading, postharvest freshness biochemistry, microbiology preservation and transportation of fish and other sea foods Preparation of fish protein concentrate, fish oil and other by products Commercially important marine products from India product export and its sustenance 	<p>(12) 2 2 2 2 2 2</p>	Lecture Method using ICT Tools and chalk and talk Assignments
<p>Module IV: Title: Dairy Processing</p> <ul style="list-style-type: none"> Dairy: Present status of milk & milk products in Indian market Milk – Composition, chemistry procurement, transportation processing, Packaging, storage Quality evaluation and testing of milk 	<p>(12) 3 2 2 2 3</p>	Lecture Method using ICT Tools and chalk and talk
<p>Module V: Title: Dairy products</p> <p>Definition, classification, composition, physiochemical properties, methods of manufacture, packaging, storage, quality evaluation and defects of;</p> <ul style="list-style-type: none"> Special milks - Condensed milk dried milk powder (instantiation) Cream, Butter Ice cream Cheese Indigenous milk products 	<p>(12) 1 2 2 1 2 4</p>	Lecture Method using ICT Tools and chalk and talk Assignments

Learning Resources

1.	Technology of Indian Milk Products, Aneja RP, Mathur BN, Chandan RC & Banerjee AK. 2002
2.	Outlines of Dairy Technology, De S. 1980
3.	Fundamental of Dairy Chemistry, Web BH, Johnson AH & Lford JA. 1987, 3rd Ed
4.	Processed Meat, Pearson AM & Gillett TA. 1996, 3rd Ed.



COURSE NAME
Advanced Food Chemistry

Credits: 4
Course Code: MFT13105

Semester: I
No of Lecture Hours: 60

Course Objective:

- To impart knowledge on carbohydrates and proteins during processing and its interactions.
- To be able to understand the lipids and its properties and role of water, its relationship in foods.
- To gain knowledge on various micro-constituents and enzymes, its mechanism of action.
- To impart knowledge on food additives and its evaluation techniques.
- To be able to understand food and nutrition with various essential nutrients and typical composition.

Course Outcome:

CO1: Ability to understand the physicochemical aspect of constituents and effect of processing on its nutritional quality.

CO2: To gain knowledge about role of water and its relevance in deterioration

CO3: Ability to know about chemistry of enzymes and its mechanism of action

CO4: Ability to understand the chemistry of food additives and its mechanism of action

CO5: To Gain knowledge about the metabolism of nutrients in human systems.

Course Content	Hours Allotted	Pedagogy
<p>Module I: Title: Major food constituents</p> <ul style="list-style-type: none"> • Carbohydrates: <ul style="list-style-type: none"> ○ Definition and importance classification, physico-chemical properties, functional properties, Structural correlations. Interactions among ○ food components- Effect on sensory and processing quality; Effect of processing on nutritional quality • Proteins: <ul style="list-style-type: none"> ○ Definition and importance, classification, physico-chemical properties, functional properties, Structural correlations. ○ Interactions among food components- Effect on sensory and processing quality; Effect of processing on nutritional quality 	<p>(12)</p> <p>6</p> <p>6</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>
<p>Module II: Title: Major Food constituents</p> <ul style="list-style-type: none"> • Lipids: <ul style="list-style-type: none"> ○ Definition and importance, classification, physico-chemical properties, functional properties, Structural correlations. 	<p>(6)</p> <p>6</p> <p>6</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>



<p>Interactions among food components- Effect on sensory and processing quality; Effect of processing on nutritional quality</p> <ul style="list-style-type: none"> • Water: <ul style="list-style-type: none"> ○ Role in food, Relationships in foods: water activity and its relevance to deteriorative processes in foods (chemical, enzymatic, physical and microbial changes). 		
<p>Module III: Title: Minor Food constituents and Enzymes</p> <ul style="list-style-type: none"> • Minor food constituents: <ul style="list-style-type: none"> ○ Minerals, vitamins, pigments, allergens, toxins and anti-nutritional compounds - Properties; Interaction in food systems; Changes during storage and processing. • Enzymes: <ul style="list-style-type: none"> ○ Definition, importance, classification and properties; Interactions among food- chemistry and mechanisms of action 	(12) 8 4	Lecture Method using ICT Tools and chalk and talk
<p>Module IV: Title: Food Additives & Toxicology</p> <ul style="list-style-type: none"> • Food Additives: <ul style="list-style-type: none"> ○ Definition, importance, classification and properties; Interactions among food- chemistry and mechanisms of action ○ Toxicology - evaluation techniques and uses • Manufacturing and applications of fibres from food sources 	(12) 7 3 2	Lecture Method using ICT Tools and chalk and talk Assignments
<p>Module V: Title: Food & Nutrition</p> <ul style="list-style-type: none"> • Food groups: Typical composition • Essential nutrients: <ul style="list-style-type: none"> ○ sources, deficiency diseases; requirements and recommended dietary allowances • Digestion, absorption, transport and metabolism of nutrients in human system 	(12) 3 7 2	Lecture Method using ICT Tools and chalk and talk Assignments

Learning Resources	
1.	Food Chemistry, Fennema OR. 1996
2.	Principles of Food Chemistry, DeMan JM. 1976.
3.	Textbook of Human Nutrition. Oxford & IBH, Bamji MS, Rao NA & Reddy V. 2003
4.	<i>Essentials of Foods and Nutrition</i> , Vol. II. Ganesh & Co, Swaminathan M. 1974



COURSE NAME
Food Microbiology

Credits: 4
Course Code: MFT13106

Semester: **I**
No of Lecture Hours: 60

Course Objective:

- To understand the nature of microorganisms involved in food spoilage, food infections and intoxications and also those used in food biotechnology (food fermentation and various food processing industries)
- To gain knowledge of principles of various techniques used in the prevention and control of the microorganisms in foods (food preservation)
- To understand criteria for microbiological safety in various foods operations to avoid public health hazards due to food contamination

Course Outcome:

CO1: Students will be able to understand the factors effecting the growth of microbes and biochemical changes caused by microorganisms.

CO2: Students will be able to gain knowledge about contamination and spoilage of various foods.

CO3: Students will be able to know about microbial toxins, food poisoning and infections caused by microbes.

CO4: Students will be able to gain knowledge on qualitative and quantitative aspects related to microorganisms associated with foods and different rapid techniques for microbial detection.

CO5: Students will be able to gain knowledge about microorganisms role in industries and fermentation.

Course Content	Hours Allotted	Pedagogy
Module I: Title: Introduction to Microbiology <ul style="list-style-type: none"> • Introduction to microbiology; Microorganisms – Definition, Classification • Foods as ecological niches- Relevant microbial groups • Microbial growth in food: <ul style="list-style-type: none"> ○ Intrinsic, extrinsic and implicit factors ○ survival of microorganisms in foods ○ Effect of injury on growth or survival. • Biochemical changes - fermentation, putrefaction and lipolysis • Antagonism and synergism in microorganisms 	(12) 2 2 4 2 2	Lecture Method using ICT Tools and chalk and talk Assignments
Module II: Title: Microbiology of Foods Health & Hygiene <ul style="list-style-type: none"> • Contamination and spoilage of foods: <ul style="list-style-type: none"> ○ Milk & Milk products ○ Fruits & vegetables – Products ○ Grains and oilseeds ○ meat and poultry 	(12) 2 2 2 4	Lecture Method using ICT Tools and chalk and talk Assignments



<p>Module III: Title: Health & Hygiene</p> <ul style="list-style-type: none"> • Food poisoning, food borne infections • Microbial toxins • Food hygiene and sanitation control: <ul style="list-style-type: none"> ○ Methods to control microorganisms (Physical, Chemical, Thermal and Non- Thermal methods) 	<p>(12)</p> <p>4</p> <p>4</p> <p>4</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>
<p>Module IV: Title: Detection of Microbes</p> <ul style="list-style-type: none"> • Methods for qualitative and quantitative assay for <ul style="list-style-type: none"> ○ Presence of microbes ○ Characterization of microbes • Rapid methods in detection of microorganisms • Microbes as <ul style="list-style-type: none"> ○ Test organisms ○ Indicator organisms ○ sensors 	<p>(12)</p> <p>4</p> <p>4</p> <p>4</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>
<p>Module V: Title: Microbial Fermentation & Industry</p> <ul style="list-style-type: none"> • Fermentation – Principles, systems, applications • Modern methods of cell culture: <ul style="list-style-type: none"> ○ synchronous and co- cell culture ○ continuous cell culture in liquid and solid media • Production of microbial proteins, lipids, polysaccharides, vitamins • Cellimmobilization and applications Pre and probiotics cultures; Utilization and disposal of industrial wastes through microorganisms; use of genetically modified microorganisms in food processing 	<p>(12)</p> <p>3</p> <p>3</p> <p>3</p> <p>3</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>

Learning Resources

1.	Basic Food Microbiology, Banawart GJ. 1989, 2nd Ed.
2.	Food Microbiology, Frazier J & Westhoff DC, 4th Ed.
3.	Modern Food Microbiology, Jay JM, Loessner MJ & Golden DA. 2005, 7 Ed.
4.	Handbook of Indigenous Fermented Foods, Steinkraus KS. 1996.



ADVANCED FOOD CHEMISTRY

PRACTICALS

Credits : 2

Subject Code : MFT13107

I Year / I Semester

No. of Practical hours: 30

Objectives:

To impart students with knowledge about the various methods involved in analysis of components present in food

Outcomes

Students will be able to understand and learn through chemical assays about the physio-chemical properties of foods during processing.

- Importance of sampling and techniques of sampling 2
- Proximate analysis of foods 2
- Estimation of Calorific value of foods 2
- Estimation of Total solids; P_H; Acidity 2
- Estimation of browning intensity 2
- Determination of beta – carotene 2
- Estimation of sugars, TSS in Degree Brix 2
- Estimation of anti nutritional factors in foods 2
- Estimation of Ash and acid insoluble ash 2
- Estimation of starches, amino acids, 2
- Estimation of Crude fibre in foods. 2
- Determination of minerals-calcium, phosphorus, iron, 2
- Estimation of vitamins-ascorbic acid, carotene, thiamine. 2
- Analysis of lipids-saponification value, acid value, peroxide and iodine value. 2
- Determination of starch and pectic substances using different methods. 2

Recommended Readings:

- Fennema OR.1996. Food Chemistry. Marcel Dekker.
- Meyer LH. 1987. Food Chemistry. CBS.
- Belitz HD.1999. Food Chemistry. Springer Verlag.
- DeMan JM. 1976. Principles of Food Chemistry. AVI.
- Bamji MS, Rao NA & Reddy V. 2003. Textbook of Human Nutrition.Oxford & IBH.
- Swaminathan M. 1974. Essentials of Foods and Nutrition. Vol. II. Ganesh & Co.



FOOD MICROBIOLOGY PRACTICALS

Credits : 2
Subject Code : MFT13108

1 Year / I Semester
No. of Lecture hours: 30

Objectives

- To familiarize with the techniques used for cultivation and purification of microbes
- To know the methods used for quality check of food and water
- To know the techniques used for identification of different pathogenic microbes.

Outcomes

- Students will gain practical knowledge in different techniques used for identification of different pathogens and will be able to understand the quality aspects of food and water.
- 1) Microscopy and micrometry.
 - 2) Preparation of nutrient media,
 - 3) Sterilization and inoculation techniques,
 - 4) Isolation of pure culture,
 - 5) Use of chemicals in preservation of foods
 - 6) Microscopic examination of bacteria, and yeast and molds
 - 7) Standard plate count
 - 8) Yeast and mould count
 - 9) Spore count
 - 10) Detection and enumeration of pathogenic and indicator organisms in food
 - 11) MPN of coli forms;
 - 12) Enumeration of physiological groups- psychrophile, thermodurics, osmophiles and halophiles.
 - 13) Microbial examination of processed and natural food products

Recommended Readings:

- Ray B. 2004. *Fundamentals of Food Microbiology*. 3rd Ed. CRC.
- Robinson RK. (Ed.). 1983. *Dairy Microbiology*. Applied Science.
- Steinkraus KS. 1996. *Handbook of Indigenous Fermented Foods*. Marcel Dekker.



Year-Wise And Semester-Wise Distribution of Courses
Department of M.Sc. Food Technology & Management
Second Semester
Academic Year 2025-2026 Batch 2025-2027 (CBCS)

S. No	Part	Subject Code	Title of the Subject	Hours /Week	Duration of Exam (hrs)	Marks			Credits
						Internal	External	Total	
1	I	MFT24201	*Computer Applications (AECC-2)	2	2	20	30	50	2
2	II	MFT24202	Processing of Plantation Products and Spices (Core-5)	4	4	40	60	100	4
3	II	MFT19203	Research Methodology (Core – 6)	4	3	40	60	100	4
4	II	MFT13204	Food Process Engineering– II(Core-7)	4	3	40	60	100	4
5	II	MFT13205	Instrumental methods of Food Analysis (Core-8)	4	3	40	60	100	4
6	II	MFT24206	Technology of Cereals and Pluses (Core -9)	4	3	40	60	100	4
7	II	MFT24207	Basic Food Chemistry (GE)	2	2	20	30	50	2
PRACTICALS									
8	II	MFT13208	Food Process Engineering (Core-7)	4	3	40	60	100	2
9	II	MFT24209	Technology of Cereals and Pluses (Core -9)	4	3	40	60	100	2
TOTAL				32		320	480	800	26

- *Ability Enhancement Compulsory Course (AECC) marks not included in CGPA score in the main certificate, but it is compulsory to pass in the examination.
- CIA components for internal marks of theory paper: (i) Weekly test: 5M (ii) Mid Sem: 10 M (iii) Prefinal: 16M (iv) Assignment: 2M (v) Viva : 2M (vi)Attendance: 4M
- CIA components for practical Internal marks: (i) Attendance/Record 5M (ii) Practical skill: 10M (iii) Prefinal: 15M



COURSE NAME
Computer Applications

Credits: 2
Course Code: MFT24201

Semester: II
No of Lecture Hours: 30

Course Objective: To study the applications of Computers and its techniques in Food Technology.

Course Outcome: Students will gain knowledge of Overview of Computer's and its importance.

CO1: To apply and explain the basic components and number system of a computer.

CO2: To understand the concepts and importance of Software.

CO3: To analyse the nature of Networks and its working.

CO4: To gain the practical knowledge of Ms-Word.

CO5: Students will be able to know about basics in Ms-Excel and its working.

Course Content	Hours Allotted	Pedagogy
Module I: Title: Basics of Computers <ul style="list-style-type: none"> • Definition and Characteristics of Computers • Data Representation – Number System • Binary, Octal and Hexadecimal • Conversion from one Number System to another 	(6) 1 1 2 2	Lecture Method using ICT Tools and chalk and talk
Module II: Title: Concepts & Commands <ul style="list-style-type: none"> • Hardware, Software, Translators, Compilers and Interpreters • System Software, Application Software • Flowchart and Algorithms with simple examples 	(6) 1 2 3	Lecture Method using ICT Tools and chalk and talk
Module III: Title: Computer Networks <ul style="list-style-type: none"> • Network Types: Local Area Network, Metropolitan Network, Wide Area Network • LAN Topologies: Bus Topology, Ring Topology, Star Topology. Communication Protocol • Network Devices: Network Interface Card. Repeater, Bridge, Hub, Switch, Router, Gateway • Wireless Networking: Bluetooth Technology, Wireless LAN, Wireless WAN 	(6) 1 1 2 2	Lecture Method using ICT Tools and chalk and talk



Module IV: Title: MS-Word <ul style="list-style-type: none"> MS-Word Screen and Its Components The Office Button The Ribbon - The Home Tab, The Insert Tab, The Page Layout Tab, The References Tab, The Mailings Tab, The Review Tab, The View Tab, The Help 	(6) 1 2 3	Lecture Method using ICT Tools and chalk and talk
Module V: Title: MS-EXCEL <ul style="list-style-type: none"> Excel: Creating a new worksheet-select, edit (Copy, move, format, setting column width etc.) Referencing cells (Addressing methods), Formulae, Charts, Macros Functions-Logical, Mathematical, Statistical, Date and Time 	(6) 2 2 2	Lecture Method using ICT Tools and chalk and talk

Learning Resources

1.	Computer Fundamentals, Anita Goel, 2010
2.	Fundamentals of Information Technology, Bharihoke, Deepak. 2012
3.	Information Technology”, the Breaking Wake. Tata Mc.Graw- Hill, Dennis P. Curtin, Kim Foley, Kunal Sen, Cathleen Morin. 2008
4.	ABCs of Windows, Crawford, Sharon, and Neil J. Salkind. 1998.



COURSE NAME
Processing of Plantation Products and spices

Credits: 4**Course Code: MFT24202****Semester: II****No of Lecture Hours: 60****Course Objective:**

- To impart knowledge on coffee and its types including processing and production
- To be able to understand about tea, tea products and its manufacturing.
- To gain knowledge on cocoa and cocoa products its processing and chocolate manufacturing.
- To impart knowledge on various spices, condiments and culinary herbs.
- To be able to understand about oleoresins, essential oils and manufacturing methods.

Course Outcome:**CO1:** Ability to understand about technological aspect of coffee processing**CO2:** To gain knowledge about tea processing and quality evaluation**CO3:** Ability to know about cocoa processing and its products manufacturing**CO4:** Ability to understand about the Indian spices, classification and its processing**CO5:** To formulate the oleoresin and essential oils and enzymatic synthesis of flavor identical.

Differentiate spices and condiments and their importance

Course Content	Hours Allotted	Pedagogy
Module I: Title: Coffee: Production, processing of coffee; - drying, fermentation, roasting and brewing of coffee o Types: decaffeinated coffee, coffee brew concentrate o Standards and specifications of coffee products • Chicory: technology of chicory powder and use in coffee products	(12) 3 3 3 3	Lecture Method using ICT Tools and chalk and talk
Module II: Title: o Tea: Production, composition and manufacturing o Types of tea o Tea products such as soluble tea, tea concentrate o Instant tea, decaffeinated and flavored tea o Quality evaluation and grading of tea.	(12) 3 2 2 3 2	Lecture Method using ICT Tools and chalk and talk
Module III: Title: • Cocoa: processing and analysis of cocoa beans • Changes taking place during fermentation of cocoa bean • Processing of cocoa products: cocoa powder, cocoa liquor manufacture, cocoa butter • Chocolates: types and technology of chocolate manufacturing	(12) 3 3 3 4	Lecture Method using ICT Tools and chalk and talk
Module IV: Title: • Spices, condiments, seasonings and culinary herbs	(12) 3 2	Lecture Method using ICT Tools and chalk and



<ul style="list-style-type: none"> • Classification and beneficial properties of spices • processing and manufacturing of major Indian spice: <ul style="list-style-type: none"> - Pepper, cardamom, ginger, chili and turmeric, clove, garlic, • Cumin, coriander, cinnamon, mint and vanilla. 	7	talk Assignments
Module V: Title: <ul style="list-style-type: none"> • Oleoresins and essential oils: method of manufacture; chemistry of the volatiles • Enzymatic synthesis of flavor identical • Adulteration problem in spices • Packaging of spices 	(12) 3 3 3 3	Lecture Method using ICT Tools and chalk and talk Assignments

Learning Resources

1.	Spices, condiments and seasonings, Kenneth T. Farrell (1985).
2.	Tea Production and Processing, Banerjee B. 2002
3.	Spice Science and Technology, Kenji Hirasa and Mitsno Takemasa(1998).
4.	Chocolate, Cocoa and Confectionery Technology, . Minifie BW. 1999, 3rd ed



COURSE NAME
Research Methodology

Credits: 4
Course Code: MFT19203

Semester: II
No of Lecture Hours: 60

Course Objective:

- To give an overview of the research methodology and explain the technique of defining a research Problem
- To understand the formulation of hypothesis and fundamentals of research design and to explain the functions of the literature review in research.
- To explain different methods of data collections
- To explain the details of sampling designs and their characteristics.
- To understand different measurement scales and to learn the structure involved in report writing.

Course Outcome:

CO1: Research methodology and the technique of defining a research problem

CO2: The procedure involved in framing hypothesis and various research designs and their characteristics

CO3: Different sources of data and methods involved in data collection

CO4: Different sampling techniques involved in research

CO5: To understand the art of interpretation and the art of writing research reports and understand the attitudes in measurement scale.

Course Content	Hours Allotted	Pedagogy
Module I: Title: Introduction <ul style="list-style-type: none"> • Definition of research – meaning – nature – scope and objectives of research • basic research terms – types of research • Research problem defined – necessity – factors to be considered while defining • Research problem • Procedure and pre-requisites for undertaking research 	(12) 2 4 3 3	Lecture Method using ICT Tools and chalk and talk
Module II: Title: Hypothesis and Research Design <ul style="list-style-type: none"> • Hypothesis and related terms – formation of hypothesis – characteristics of good Hypothesis • Fundamentals of Research Design – significance – features – steps – types of research design • Review of literature – operational definitions 	(12) 4 4 4	Lecture Method using ICT Tools and chalk and talk
Module III: Title: Data Collection <ul style="list-style-type: none"> • Data collection and measurement – definition and characteristics of data – 	(12) 4 4	Lecture Method using ICT Tools



<ul style="list-style-type: none"> primary data and secondary data – characteristics – advantages and disadvantages Sources of data – methods of data collection – observation method – personal interview forms, schedules and questionnaire method Documented sources of data – case study method 	4	and chalk and talk
<p>Module IV: Title: Sampling</p> <ul style="list-style-type: none"> Sampling and sampling design – definitions – variables – methods of sampling – probability sampling methods simple random sampling – stratified sampling – systematic sampling – multi-stage sampling – non-probability sampling – judgement sampling – convenience sampling – quota sampling – hit or accidental sampling size of sample – determination of sampling size – sampling and non-sampling errors. 	(12) 4 5 3	Lecture Method using ICT Tools and chalk and talk Assignments
<p>Module V: Title: Attitude Measurement, Data Processing, Report Writing</p> <ul style="list-style-type: none"> Attitude measurement and scales – definition of attitude – importance – 3 measurement of attitudes – concept of scale basis for scale classifications – attitude scales – Thurston’s scale Likert’s scale – Guttman’s or cumulative scale – radio scales – opinion scales basic statistical tools. Data Processing – editing – codification – classification and tabulation of data quantitative analysis of data. Report writing and presentation – definition – purpose – report synopsis – types of report – characteristics of a good report – structure of a good research report – writing and formatting of reports 	(12) 3 3 1 3 2	Lecture Method using ICT Tools and chalk and talk Assignments

Learning Resources

1.	Research Methodology, Kothari, C.R, 2013
2.	Methodology of Research in Social Sciences, Swamy Krishna, R. and Ranganathan, M, 1 st edition.
3.	Business Research Methodology, Sachdeva, J.K. 2008, 1 st edition



COURSE NAME
Food Process Engineering-II

Credits: 2
Course Code: MFT13204

Semester: II
No of Lecture Hours: 60

Course Objective:

- To impart students with knowledge related to engineering aspects in food technology.
- To introduce in a systematic way the most common food engineering unit operations.
- To design food processes and the equipment needed to carry them out

Course Outcome:

- CO1:** Students will be able to understand about fluid dynamics and problems related to it.
CO2: Students will gain knowledge on unit operations and psychrometry.
CO3: Students will be able to understand about heat transfer methods and its laws
CO4: Students will gain knowledge on equipment's of heat exchange and evaporation
CO5: Students will be able to understand about physical separation processes

Course Content	Hours Allotted	Pedagogy
Module I: Title: Fluid Dynamics <ul style="list-style-type: none"> • Newtonian and non-Newtonian fluids • Transportation of Fluids- Continuity principle • Bernoulli equation- Reynolds number • Flow measuring instruments: Orifice meter- Venturi meter- Rota-meter • Problems 	(12) 2 2 2 2 4	Lecture Method using ICT Tools and chalk and talk
Module II: Title: Psychrometry; Drying & Extraction <ul style="list-style-type: none"> • Mass transfer - Psychrometry • heat and Mass transfer in dehydration • stage of drying- prediction of drying from drying rate data • dehydration- water activity • types of driers – problems • extraction- types- principles- systems- problems 	(12) 2 2 2 2 2 2	Lecture Method using ICT Tools and chalk and talk
Module III: Title: <ul style="list-style-type: none"> • Heat transfer- types- estimation of thermal conductivity of food products, local heat transfer coefficients • Fourier's law of heat transfer- temperature profile of unidirectional heat transfer through conduction • heat transfer by convection- heat transfer by radiation • Kirchoff's law- Stephan- Boltz man- plank's distribution law, Wein's displacements law • microwave and direct electric heating 	(12) 2 2 2 2 2 2	Lecture Method using ICT Tools and chalk and talk



<ul style="list-style-type: none"> Temperature measuring devices- various thermometers- Examples Steady state heat transfer- calculation 		
<p>Module IV: Title:</p> <ul style="list-style-type: none"> heat exchanger equipment- types; importance of counter current flow equation- heat transfer to non-Newtonian fluids in laminar flow- examples unsteady state heat transfer – Fourier number – Biot number – Heisler and gurney, Lurie charts- calculations evaporation – single effect evaporators, improving the economy of evaporators, essence recovery – problems 	<p>(12)</p> <p>3</p> <p>3</p> <p>3</p> <p>3</p>	<p>Lecture Method using ICT Tools and chalk and talk</p> <p>Assignments</p>
<p>Module V: Title:</p> <ul style="list-style-type: none"> Physical separation process: <ul style="list-style-type: none"> Filtration <ul style="list-style-type: none"> filtrate flow through filter cake constant pressure filtration optimization of filtration cycles- types of filtrations Reverse osmosis sieving- gravity separation material handling equipment Problems 	<p>(12)</p> <p>2</p> <p>2</p> <p>2</p> <p>2</p> <p>4</p>	<p>Lecture Method using ICT Tools and chalk and talk</p> <p>Assignments</p>

Learning Resources

1.	Basics of Food Engineering, Romeo Toledo
2.	Food Engineering Operations. Elsevier, Brennan JG, Butter JR, Corell ND & Lilly AVE. 1990
3.	Unit Operations of Chemical Engineering. McGraw Hills, Charm SE, McCabe WL, Smith JC & Harriott P.1993.
4.	Introduction to Food Engineering. Academic Press, Singh RP & Heldman DR. 1993.



COURSE NAME
Instrumental methods of Food Analysis

Credits: 4
Course Code: MFT13205

Semester: II
No of Lecture Hours: 60

Course Objective:

- To understand the basic concepts of chemistry and food analysis.
- To acquire knowledge on the basic principles of spectroscopy.
- To understand the various microscopic and image analyzing techniques.
- To gain knowledge of different chromatographic techniques.
- To understand the various separation techniques.

Course Outcome:

CO1: Students will be able to implement basic formulas to measure and perform calibration and standardization in experiments.

CO2: Students will be able to apply spectrophotometric techniques [UV-Vis spectrophotometry, fluorimetry, FT- spectrophotometry, Turbidometry.]

CO3: Students will separation be able to understand refractive index and polarimetry and apply microscopic techniques.

CO4: Students will be able to apply chromatographic techniques-HPLC, Gas Chromatography (GC) with various detectors.

CO5: Students will be able to apply various separation techniques like electrophoresis, ultracentrifugation.

Course Content	Hours Allotted	Pedagogy
Module I: Title: Introduction to Food Analysis <ul style="list-style-type: none"> • Review of basic chemistry concepts • Introduction to food analysis – Sampling techniques • Water activity, its measurements and significance in food quality • Calibration and standardization of different instrument 	(12) 3 3 3 3	Lecture Method using ICT Tools and chalk and talk
Module II: Title: Spectroscopy <ul style="list-style-type: none"> • Basic principles of spectroscopy • Spectroscopic techniques using; <ul style="list-style-type: none"> ○ UV/Vis, fluorescence ○ IR, FTIR ○ NIR, NMR ○ atomic absorption 	(12) 2 10	Lecture Method using ICT Tools and chalk and talk
Module III: Title: Refractometry & Microscopic Techniques <ul style="list-style-type: none"> • ICP, polarimetry • Refractometry • microscopic techniques in food analysis <ul style="list-style-type: none"> ○ light microscopy ○ SEM, TEM 	(12) 2 2 8	Lecture Method using ICT Tools and chalk and talk



<ul style="list-style-type: none"> ○ XRD ○ particle size analysis • Image analysis 		
Module IV: Title: Chromatographic Techniques <ul style="list-style-type: none"> • Chromatographic techniques: <ul style="list-style-type: none"> ○ Adsorption, column ○ partition, affinity ○ ion exchange, size exclusion ○ GC, GLC ○ HPLC, HPTLC • GCMS, LCMS 	(12) 2 2 2 2 2 2	Lecture Method using ICT Tools and chalk and talk Assignments
Module V: Title: Separation Techniques <ul style="list-style-type: none"> • Separation techniques: <ul style="list-style-type: none"> ○ Gel filtration, dialysis ○ electrophoresis, sedimentation ○ ultra filtration and ultra-centrifugation ○ solid phase extraction ○ supercritical fluid extraction ○ iso-electric focusing • isotopic techniques, manometric techniques 	(12) 2 2 2 2 1 1	Lecture Method using ICT Tools and chalk and talk Assignments

Learning Resources

1.	Handbook of Food Analysis, Leo ML. 2004, 2nd Ed.
2.	Official methods of analysis of AOAC International, AOAC International. 2003, 17th Ed
3.	Pearson's Chemical Analysis of Foods, Kirk RS & Sawyer R. 1991, 9th Ed
4.	Analytical Techniques for Foods and Agricultural Products, Linden G. 1996



COURSE NAME
Technology of Cereals and Pulses

Credits: 4
Course Code: MFT24206

Semester: II
No of Lecture Hours: 60

Course Objective:

- To impart students the knowledge about the technology involved in milling of cereals, pulses and processing them to several byproducts
- To provide the students with basic ideas about the cereal's, millets, bakery & pulses food like rice, wheat, corn, sorghum which are consumed throughout the world.
- To provide the students with overall importance of these in food processing operations by improving their technical and professional competence

Course Outcome:

- CO1:** Imparts knowledge various processing methods involved in wheat & rice
CO2: Explains various milling & applications of corn, sorghum & millets
CO3: Gains knowledge on various raw materials used in baking industry
CO4: Explains the technology involved in various bakery products
CO5: Imparts knowledge various processing methods involved in pulses

Course Content	Hours Allotted	Pedagogy
<p>Module I: Title: Wheat & Rice</p> <ul style="list-style-type: none"> ○ Structure and chemical composition of wheat grain, types of wheat. ○ Wheat milling, wheat products and wheat byproducts ○ Wheat flour- types, quality, flour improvers, bleaching agents, dough rheology & its measurements. ○ Rice- structure and chemical composition of rice grain ○ Rice milling, types, general principles & unit operations involved, factors affecting rice yield during milling. ○ Parboiling- methods, advantages & disadvantages ○ Rice products and byproducts: Rice convenience foods, cooking quality characteristics, ○ factors affecting cooking quality of rice grain. 	<p>(12)</p> <p>2 2 2 1 2 1 2</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>
<p>Module II: Title: Corn & Millets</p> <ul style="list-style-type: none"> • Structure and composition of corn grain • Milling: wet and dry milling of corn and its products • Corn starch and corn sweeteners (high fructose corn syrups) and their uses. • Sorghum- Structure and composition of sorghum grain & its varieties • Milling of sorghum and its products • Applications of various sorghum forms 	<p>(12)</p> <p>2 2 2 2 1 1 2</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>



<ul style="list-style-type: none"> Processing of millets. 		
Module III: Title: Baking Industry Baking industry: Strategies in Indian baking industry <ul style="list-style-type: none"> Recent trends in terms of economic growth in Indian baking industry Bakery products: Role of raw materials, additives, preservatives, and miscellaneous agents Raw material properties & quality parameters. 	(12) 2 1 6 3	Lecture Method using ICT Tools and chalk and talk
Module IV: Title: Bakery Products <ul style="list-style-type: none"> Technology for manufacture of bakery products: bread, biscuits, cookies, cakes Pasta products and various processed cereal-based foods, quality parameters Barley malting process: steeping, germination and drying Different types of malts and their food applications Barley beta glucans and their food functionality 	(12) 4 3 3 1 1	Lecture Method using ICT Tools and chalk and talk
Module V: Title: Pulses <ul style="list-style-type: none"> Pulses- introduction, production, utilization trends Structure, composition, anti-nutritional factors Processing (pulse milling-dry and wet, general principles and process operation for production of split pulses (traditional, modern and CFTRI method of pulse milling) and storage Manufacture of protein concentrates and protein isolates 	(12) 2 2 6 2	Lecture Method using ICT Tools and chalk and talk

Learning Resources

1.	<i>The Chemistry and Technology of Cereals as Food and Feed</i> , Samuel, A.M.(1996)
2.	<i>Wheat : Chemistry and Technology</i> , Pomeranz, Y.(1998)
3.	<i>Rice Chemistry and Technology</i> , Juliano, B.O.(1985).
4.	<i>Bakery Science & Technology</i> , Matz SA. 1992, 3 rd Ed.



COURSE NAME
Basic Food Chemistry

Credits: 2
Course Code: MFT24207

Semester: II
No of Lecture Hours: 60

Course Objective:

- To understand the concept of basic components of food
- To study the sources, composition, and processing effects of food constituents
- To gain knowledge on various functions of the food components

Course Outcome:

CO1: Evaluate the importance and role of carbohydrates in food

CO2: Explain the reactions of lipids in food .

CO3: Analyze the functional properties of proteins in food.

CO4: Importance of water, vitamins and minerals in food and processing effects

CO5: Classify the enzymes of importance in food

Course Content	Hours Allotted	Pedagogy
Module I: Title: Carbohydrates <ul style="list-style-type: none"> • Carbohydrates: monosaccharides, disaccharides, oligosaccharides and polysaccharides • Functions of monosaccharides and oligosaccharides • Functions of Polysaccharides: Starch, Cellulose, hemicellulose, • Heteropolysaccharides: Pectin, Gums (Alginates, carragean, locust bean gum, xanthan gum). 	(12) 2 1 1 2	Lecture Method using ICT Tools and chalk and talk
Module II: Title: Lipids <ul style="list-style-type: none"> • Lipids: - definition, classification of lipids • Fats and oils, sterols, phospholipids • Rancidity and its types. • Fats replacers (protein based, fat based, carbohydrate based) 	(12) 2 1 2 1	Lecture Method using ICT Tools and chalk and talk
Module III: Title: Proteins <ul style="list-style-type: none"> • Proteins: definition and classification • Proteins: Sources • Functional properties • Amino-acids classification with examples • Protein changes during processing of food 	(12) 2 2 2 2 2	Lecture Method using ICT Tools and chalk and talk
Module IV: Title: Vitamins, Minerals and Water <ul style="list-style-type: none"> • Minerals- Types, Sources, Functions, Deficiencies • Effect of Processing on vitamins and minerals • Water: - Fundamental Properties • Water- Availability in foods: Water composition • Water Activity on Food stability (Shelf life) 	(12) 1 1 1 1 1	Lecture Method using ICT Tools and chalk and talk



Module V: Title: Enzymes <ul style="list-style-type: none"> • Enzymes: - classification • Factors influencing activity: Temperature, pH, water activity • Application of enzymes • Browning reactions– Enzymatic & Non enzymatic, Methods to prevent browning 	(12) 3 3 3 3	Lecture Method using ICT Tools and chalk and talk
--	---------------------------------	---

Learning Resources	
1.	Food Chemistry, Owen R. Fennema, 1996, 3 rd Edition
2.	Food Chemistry, Meyer L.H, 2004, 1 st Edition
3.	Food Science, Norman N. Potter, 1996, 5 th Edition.
4.	Food Science, B. Srilakshmi, 2001, 2 nd Edition.



**FOOD PROCESS ENGINEERING
PRACTICALS**

Credits : 2

Subject Code : MFT13208

I Year / II Semester

No. of Lecture hours: 30

Objectives:

To impart students with knowledge related to engineering aspects in food technology.

Outcomes:

The students will be able to have practical knowledge & understanding about the principles of food science and the properties of components associated with it.

PRACTICALS

- 1) Determination of viscosity of Newtonian fluid and Non Newtonian fluids
- 2) Design of pumping systems
- 3) Determination of thermal properties of foods - thermal conductivity, thermal diffusivity, calorific value and specific heat
- 4) Calculation of freezing time for some typical foods
- 5) Study of different types of freezers
- 6) Calculation of thermal process time in canning of some foods
- 7) Determination of 'U' for PHE
- 8) Determination of 'U' for SSHE
- 9) Study of blast freezer
- 10) Visit to Food Processing Plants.

Recommended Readings:

- Fundamentals of food process engineering by Romeo T. Toledo 2nd edition, CBS publishers, New Delhi.
- Unit operations of chemical engineering by W.L. McCabe, Julian Smith 1993, McGraw Hill.
- Experiments in food process engineering by H. Pandey, First edition, 2004. CBS Publisher, Delhi.
- Experiments in food process Engineering by R. Paul Sin



TECHNOLOGY OF CEREALS AND PULSES PRACTICALS

Credits : 2
Subject Code : MFT24209

I Year / II Semester
No. of Lecture hours: 30

Objectives

- To learn quality control of raw and processed food products.
- To conduct physical, chemical and nutritional analysis of commonly consumed raw and processed foods with or without additives.

Outcomes

- Students will gain practical knowledge in determining and estimating chemical composition of various food components through chemical and instrumental analysis.

PRACTICAL

1. Determination of dough relaxation constants and their interpretation
2. Effect of mixing method on the quality of baked product;
3. Effect of mixing time on the rheological characteristics of dough;
4. Effect of mixing time on the crispness and firmness of biscuits;
5. Effect of additives on the quality and textural characteristics of bakery products;
6. Development and quality evaluation of baked products based on composite flour;
7. Preparation and quality evaluation of cakes, croissant, doughnuts, and pizza base
8. Preparation and Quality evaluation of Confectionery Products
9. Preparation of chocolate
10. Quality evaluation of chocolate products
11. Visit to bakery industries.
12. Visit to confectionery industries

Recommended Readings:

- Samuel, A.M.(1996) “ *The Chemistry and Technology of Cereals as Food and Feed* “, CBS Publisher & Distribution, New Delhi.
- Pomeranz, Y.(1998) “ *Wheat : Chemistry and Technology*”, Vol 1,3” Am. Assoc.
- Cereal Chemists. St. Paul, MN, USA.
- Honeney, R.C.(1986) “ *Principles of Cereal Science and Technology*”, Am. Assoc.
- Cereal Chemists, St. Paul, MN, USA.
- Pomeranz, Y. (1976) “ *Advances in Cereal Science and Technology*”, Am. Assoc. Cereal Chemists St.Paul, MN, USA.
- Juliano, B.O.(1985). “ *Rice Chemistry and Technology*”, Am. Assoc. Cereal Chemists, St. Paul, MN,US



Year-Wise and Semester-Wise Distribution of Courses
Department of M.Sc. Food Technology & Management
Third Semester
Academic Year 2025-2026 Batch 2024-2026 (CBCS)

S. No	Part	Subject Code	Title of the Subject	Hours /Week	Duration of Exam (hrs)	Marks			Credits
						Internal	External	Total	
1	I	MFT25301	*Human Values and Professional Ethics (AECC -3)	2	2	20	30	50	2
2	II	MFT25302 A / MFT25302 B	Tech. of Fermented Foods & Beverages/ Tech. of Sugar confectionery & chocolate processing (DSE-1)	4	3	40	60	100	4
3	II	MFT25303	Extrusion Technology (Core-10)	4	3	40	60	100	4
4	II	MFT25304	Advances in Food Packaging (Core - 11)	4	3	40	60	100	4
5	II	MFT25305	Food Quality systems & Management (Core -12)	4	3	40	60	100	4
6	II	MFT25306	Energy Conservation & Auditing (Core-13)	4	3	40	60	100	4
7	II	MFT25307	Food Supply & Cold Chain Management (Core- 14)	4	3	40	60	100	4
PRACTICALS									
8	II	MFT25308	Adv. Food Packaging (Core - 11)	4	3	40	60	100	2
9	II	MFT25309	Food Quality systems & Management (Core -12)	4	3	40	60	100	2
TOTAL				34		340	510	850	28

*Ability Enhancement Compulsory Course (AECC) marks not included in the CGPA score in the main certificate, but it is compulsory to pass in the examination.

- Discipline Specific Elective (DSE)
- CIA components for internal marks of theory paper: (i) Weekly test: 5M (ii) Mid Sem: 10 M (iii) Prefinal: 16M (iv) Assignment: 2M (v) Viva: 2M (vi) Attendance: 4M
- CIA components for practical Internal marks: (i) Attendance/ Record 5M (ii) Practical skill: 10M (iii) Prefinal: 15M

Paul

Prof. Bhanoori Manjula, Ph.D.,
 Department of Food Technology
 Loyola Academy
 Alwal, Secunderabad
 T.S. 500 010



COURSE NAME
HUMAN VALUES AND PROFESSIONAL ETHICS

Credits: 02

Semester: III

Course Code: MFT25301

No of Lecture Hours: 30

Course Objective:

- Develop a deep understanding of human and interpersonal values.
- Cultivate critical thinking skills to analyze situations, make informed decisions, and solve problems creatively.
- Analyze Ethical Theories and develop Ethical Decision-Making Skills.
- Develop organizational skills to maintain order and efficiency in both personal and professional life.
- Foster resilience to overcome challenges and setbacks, building a positive mindset in the face of adversity and promote a sense of global citizenship by understanding interconnectedness and global issues.

Course Outcome:

CO1: Students will be able to understand the concept of Universal Human Values

CO2: Students will be able to analyze Ethical Theories and develop Ethical Decision-Making Skills

CO3: Students will be able to cultivate Interpersonal Skills and Communication

CO4: Students will be able to examine Ethical Issues in Various Professions

CO5: Students will be able to promote Social Responsibility and reflect on Personal and Professional Values

Course Content	Hours	Pedagogy
	Allotted	
Module I: Title: Human Values	6	Power point presentations / Lectures
<ul style="list-style-type: none"> • Positive affirmations, Assertiveness, Constructive Criticism • Human Relationship – formal and informal • Boundaries in relationships • Guilt and grudges • Forgiveness – accepting self & others. 		
Module II: Title: Professional Values	6	Power point presentations / Lectures
<ul style="list-style-type: none"> • Dealing with changes, adaptability skills • Transition from College to career • Work-life balance • Leader and manager • Integrity, Accountability, sustainability and Social responsibility 		
Module III: Title: Ethical Theories	6	Assignments



<ul style="list-style-type: none"> • Distinction between ethics and morality • Common Ethical Dilemmas in the Profession • Ethical theories: Utilitarianism, Deontology, Virtue Ethics, Ethical Relativism, Consequentialism and Rights-based Ethics • Application of ethical theories in real-life dilemmas. 		Lectures
Module IV: Title: Ethical Decision-making	6	Assignments / Lectures Assignments
<ul style="list-style-type: none"> • Steps involved in Ethical decision-making • Case studies to analyze and resolve ethical dilemmas • Problem-solving skills – Process, approaches, and their components • Lateral thinking, Tools and techniques, application of SMART analysis 		
Module V: Title: Ethics in Profession	6	Lectures
<ul style="list-style-type: none"> • Interpersonal skills for ethical collaboration in a diverse workplace • Ethical issues and challenges in business, healthcare, technology, and academia • Case studies to understand the ethical dimensions of professional practices • Addressing biases and promoting inclusivity in professional interactions 		

Learning Resources	
1	Textbook: Handout on Human Values and Professional Ethics – Loyola



COURSE NAME
Technology of Fermented Foods and Beverages

Credits: 4
Course Code: MFT252302/A

Semester: III
No of Lecture Hours: 60

Course Objective:

- To impart knowledge on the basics of fermentation process.
- To impart knowledge on lactic acid fermentation.
- To impart knowledge on soy based and dairy based fermented foods
- To impart knowledge on various fermented alcoholic beverages.
- To impart knowledge on brewing technology and alcoholic distilled beverages made using brewing technology

Course Outcome:

CO1: Be able to understand the principles of food fermentation technology.

CO2: Be able to study the types of starters used in the Food Industry.

CO3: Be able to study soy based fermented products and dairy products

CO4: Be able to study the production of various fermented alcoholic beverages.

CO5: Be able to study brewing technology for production of alcoholic distilled beverages from Fruits and vegetable and grain

Course Content	Hours Allotted	Pedagogy
<p>Module I: Title: Fermented Foods</p> <ul style="list-style-type: none"> • Fermentation • Fermented foods – sauerkraut, cucumber pickles, olive pickles. • Oriental fermented foods – soy sauce, tofu, miso, tempeh, ontyons, ham natto, natto. • Traditional fermented foods – idli, dosa, etc., • fermented meat and milk products 	<p>(12)</p> <p>1</p> <p>3</p> <p>4</p> <p>2</p> <p>2</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>
<ul style="list-style-type: none"> • Module II: Title: Introduction to Beverages & Water • Beverages – Classification, Types, Scope and importance • status of beverage industry in India • Packaged drinking water- definition, types, • manufacturing processes of raw and processed water • Quality evaluation of raw and processes water • methods of water treatment 	<p>(12)</p> <p>2</p> <p>1</p> <p>2</p> <p>2</p> <p>1</p> <p>1</p> <p>3</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>



<ul style="list-style-type: none"> BIS quality standards (for bottled water; mineral water, natural spring water, flavored water, carbonated water). 		
Module III: Title: Fruit & Speciality Beverages <ul style="list-style-type: none"> Fruits Beverages – Types, Definitions Manufacturing process and technology Packaging, storage quality evaluation Recent advances in juice processing technology Equipment's & tools for juice extraction Note on Specialty beverages based on <ul style="list-style-type: none"> tea, coffee cocoa, spices Plant extracts, herbs, nuts dairy and imitation dairy-based beverages 	(12) 2 2 1 2 1 1 1	Lecture Method using ICT Tools and chalk and talk
Module IV: Title: Fermented alcoholic beverages <ul style="list-style-type: none"> Fermented Beverages-Definition-Classification- Technology of beer manufacturing Equipment's used- quality control. Wine- classification-Technology of manufacturing Equipment's used- quality control Apple cider-manufacturing method Equipment's used- quality control Role of yeast in technology of brewing process 	(12) 2 2 1 2 1 1 1 2	Lecture Method using ICT Tools and chalk and talk
Module V: Title: Fermented alcoholic distilled Beverages: <ul style="list-style-type: none"> Definition-Classification- manufacturing processes. Equipment's Used-Quality evaluation. Brandy– Definition- Raw material- manufacturing method. Whisky– Definition- Raw material- manufacturing method. Rum – Definition- Raw material- manufacturing method Gin– Definition- Raw material- manufacturing method Taquilla– Definition- Raw material- manufacturing method. Vodka– Definition- Raw material- manufacturing method 	(12) 1 1 2 2 2 1 1	Lecture Method using ICT Tools and chalk and talk

Learning Resources	
1.	Hand Book of Fermented foods and Beverages , 1 st edition. Mumbai: Himalaya Books Publishing House. Ravinder, A. Srinivas Maloo and Dr.Emmanuel, S.J. 2013
2.	Handbook of Brewing , Priest, F.G. and Stewart, G.G. 2006. 2 nd edition
3.	Commercial Wine Making - Processing and Controls , Richard, P. 1981
4.	Industrial Microbiology , Prescott, S.C. and Dunn, C.G. 1959, 6 th edition

**COURSE NAME****Technology of Sugar confectionery and chocolate processing****Credits: 4****Course Code: MFT25302/B****Semester: III****No of Lecture Hours: 60****Course Objective:**

- To impart knowledge on the quality of confections and properties of different ingredients used.
- To impart knowledge on the flour-based confections
- To impart knowledge on various sugar-based confections
- To impart knowledge on different confections and chewing gum technology
- To impart knowledge on the cocoa processing and confections made of cocoa

Course Outcome:

CO1: Be able to understand the general properties of confectionery used in industry and their quality aspects

CO2: Be able to understand the importance and manufacturing of flour-based confectionery.

CO3: Be able to understand the manufacturing of various sugar-based confections

CO4: Be able to understand the manufacturing and technology of different confectioneries

CO5: Be able to understand cocoa processing and chocolate processing

Course Content	Hours Allotted	Pedagogy
Module I: Title: Introduction to Confectionery Industry <ul style="list-style-type: none"> • Raw Materials for Confectionery Manufacture • Important properties – Sugar, glucose syrup, Dried milk products, cocoa, • Speciality fats, Emulsifiers, Nut kernels, Alcoholic ingredients and other minor ingredients. • General technical aspects of industrial sugar confectionery manufacture • Confectionery – composition, structure • Quality aspects 	(12) 6 2 2 2	Lecture Method using ICT Tools and chalk and talk
Module II: Title: Manufacture of Confectionery I <ul style="list-style-type: none"> • Flour confectionery • Ingredients, importance of consistency • Indian flour confections • Properties of flour • Flourspecification Manufacturing of different Flour Confectionery <ul style="list-style-type: none"> ○ Laddoo ○ Halwa ○ Puran Poli ○ Jalebi 	(12) 3 2 2 5	Lecture Method using ICT Tools and chalk and talk



○ Cakes		
Module III: Title: Manufacture of Confectionery II	(12)	Assignments
• High boiled sweets– Ingredients, Methods of manufacture– Product types	3	
• Manufacture of Caramel	2	Lecture Method using ICT Tools
• Manufacture of Toffee and fudge	3	and chalk and talk
• Manufacture of Liquorices paste	1	
• Manufacture of Count Lines	1	
• Manufacture of Aerated confectionery	2	
Module IV: Title: Manufacture of Confectionery III	(12)	Lecture Method using ICT Tools and chalk and talk
• Manufacture of Lozenges	2	
• Manufacture of Fruit confections	2	
• Manufacture of sugar panned sweets	2	
• Manufacture of gums & jellies	2	
• Chewing gum Technology	3	
	3	
Module V: Title: Chocolate Processing	(12)	Lecture Method using ICT Tools and chalk and talk
Chocolate Processing Technology:		
○ Cocoa bean – harvesting, processing	6	
○ production of cocoa liquor	2	
○ cocoa butter processing	2	
○ cocoa butter substitutes	2	
• Manufacture of chocolate	2	
• Tempering technology	2	
• Enrobing technology		
• Dark, milk and white chocolate - manufacturing processes.		

Learning Resources

1.	Sugar Confectionery Manufacture , Jackson, E.B.1999, 2 nd Edition
2.	Hand Book of Sugars for Processors , Junk, W.R.and Pancost, H.M. 1973
3.	Wiley Encyclopaedia of Food Science & Technology , Francis, F.J. 2000



COURSE NAME
Extrusion Technology

Credits: 4
Course Code: MFT25303

Semester: III
No of Lecture Hours: 60

Course Objective:

- To impart knowledge on extrusion technology.
- To impart knowledge on the extruder types.
- To impart knowledge on pre-conditioning operations.
- To impart knowledge on manufacturing of breakfast cereals and texturized vegetable protein using extrusion.
- To impart knowledge on snack products made of different extrusion technologies

Course Outcome:

CO1: Be able to understand the basic concept of extrusion and different chemicals & nutritional changes happening in food during the process

CO2: Be able to learn various extruder types and the problems associated with them

CO3: Be able to understand the suitability of raw materials, preconditioning operations, their benefits & practical considerations

CO4: Be able to apply extrusion on various breakfast cereals and manufacturing of texturized vegetable proteins

CO5: Be able to understand, learn different snack production using different extruder types and recent advances and future aspects of food extrusion technology.

Course Content	Hours Allotted	Pedagogy
Module I: Title: Introduction to Extrusion Extrusion <ul style="list-style-type: none"> ○ Definition, introduction to extruders ○ Extruders in the food industry – History, uses, principles and types Chemical and nutritional changes in food during extrusion. Single screw extruder <ul style="list-style-type: none"> ○ Principle of working, net flow ○ Factors affecting extrusion process ○ Co-kneaders 	(12) 2 2 2 2 2 2	Lecture Method using ICT Tools and chalk and talk
Module II: Title: Extruders Twin screw extruder: <ul style="list-style-type: none"> • Counter rotating and co-rotating twin screw extruder • Process characteristics of the twin screw extruder <ul style="list-style-type: none"> • Heat transfer and energy balances • Problems associated with twin screw extruder • Interpreted flight expanders/ extruders • Dry extruders 	(12) 2 3 2 2 2 1	Lecture Method using ICT Tools and chalk and talk
Module III: Title: Pre-Conditioning & Practical Considerations	(12) 3	Lecture Method using ICT Tools



<ul style="list-style-type: none"> • Pre- extrusion • Pre-conditioning of raw materials used in extrusion process • Pre-conditioning operations • Benefits of pre-conditioning • Extrusion cooking technology • Post extrusion processes 	<p>4 1 2 2</p>	<p>and chalk and talk</p>
<p>Module IV: Title: Breakfast Cereals & Texturized vegetable proteins Breakfast cereals</p> <ul style="list-style-type: none"> ○ Introduction, Classification of Breakfast cereals ○ Manufacturing process ○ Quality testing for Ready to eat breakfast cereals <p>Texturized vegetable proteins Introduction, Definition, classification Manufacturing process: traditional and Extrusion methods Quality parameters of TVP</p>	<p>(12) 1 3 2 1 3 2</p>	<p>Lecture Method using ICT Tools and chalk and talk Lecture Method using ICT Tools and chalk and talk</p>
<p>Module V: Title: Snack Food Extrusion & Advances in Extrusion</p> <ul style="list-style-type: none"> • Snack food extrusion: <ul style="list-style-type: none"> ○ First & Second-generation snacks ○ Third generation (3G) Snacks: types, available brands, ○ Co- extruded snack • Recent Advances in Extrusion Technology: <ul style="list-style-type: none"> ○ Hot melt extrusion. ○ Supercritical fluid extrusion. ○ Extrusion-based 3-D printing 	<p>(12) 4 2 2 4</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>

Learning Resources	
1.	The Technology of Extrusion Cooking, Frame, N.D.1994
2.	Snack Food, Gordon, B.R.1990, . 1 st edition
3.	Snack Food Technology, Samuel AM.1976, . 3 rd edition



COURSE NAME
Advances in Food Packaging

Credits: 4

Course Code: MFT25304

Semester: III

No of Lecture Hours: 60

Course Objective:

1. To impart knowledge on packaging technology and properties of packaging materials.
2. To impart knowledge on different packaging techniques and its importance.
3. To impart knowledge on food, packaging and environmental interactions and recent trends in food packaging technology.
4. To impart knowledge on various emerging food packaging systems in relation to food industries.
5. To impart knowledge on shelf life of various products and its studies to increase quality characteristics

Course Outcome:

CO1: Be able to understand the selection and importance of food packaging

CO2: Be able to gain knowledge about different packaging systems in food

CO3: Be able to know about package flavor interaction and novel applications

CO4: To impart knowledge on various emerging food packaging systems in relation to food industries

CO5: To impart knowledge on shelf life of various products and its studies to increase quality characteristics

Course Content	Hours Allotted	Pedagogy
Module I: Title: Introduction to Packaging Technology <ul style="list-style-type: none"> • Packaging – Definition, objectives and functions • Packaging requirements and selection of packaging materials • Types of packaging materials and their properties • Food packaging systems: Forms of packaging and different packaging systems for foods • Packaging equipment and machinery 	(12) 2 2 3 3 2	Lecture Method using ICT Tools and chalk and talk
Module II: Title: Packaging Techniques <ul style="list-style-type: none"> • Active and intelligent packaging – packaging techniques • Current use of novel packaging techniques, Oxygen, ethylene and other scavengers and scavenging technology • Antimicrobial food packaging: system construction • Factors affecting the effectiveness of antimicrobial packaging • Non-migratory bioactive polymers (NMBP) in food packaging • Advantages, limitations 	(12) 2 2 3 2 1 2	Lecture Method using ICT Tools and chalk and talk



<ul style="list-style-type: none"> inherently bioactive synthetic polymers: types and applications 		
Module III: Title: Package Interactions & Novel Applications <ul style="list-style-type: none"> Packaging-flavor interactions; Factors affecting flavor absorption Role of the food matrix; role of differing packaging materials Active packaging – Novel applications Time-temperature indicators (TTIs), Definitions, classification, Requirements Development – Current TTI systems – effectiveness and utilization Testing and regulatory aspects of food packaging materials 	(12) 2 1 2 3 2 2	Lecture Method using ICT Tools and chalk and talk
Module IV: Title: Modern packaging systems <ul style="list-style-type: none"> Modern packaging systems: Green plastics for food packaging Edible food packaging Developing novel biodegradable materials Nano technology in food packaging: applications Legislative issues, Current applications Integrating intelligent packaging Creating integrated packaging, storage and distribution Role of packaging in the supply chain 	(12) 2 1 2 1 2 2 1	Lecture Method using ICT Tools and chalk and talk
Module V: Title: Shelf Life Studies <ul style="list-style-type: none"> Shelf life of foods, processed and packaged foods Factors influencing the shelf life of a product Labelling, label regulations, printing and package design Determination of shelf life from product side Determination of shelf life – direct methods, indirect methods Accelerated studies; Challenge testing; Extended shelf life foods 	(12) 2 2 2 2 2 2	Lecture Method using ICT Tools and chalk and talk

Learning Resources	
1.	Food Packaging: Aspects of Analysis and Migration Contaminants , Crosby, N.T. 1981
2.	Food Packaging , Kadoya, T.1990
3.	Developments in Food Packaging , Palling, S.J. 1980
4.	A Handbook of Food Packaging , Painy, F.A. 1992



COURSE NAME
Food Quality Systems & Management

Credits: 4

Course Code: MFT25305

Semester: III

No of Lecture Hours: 60

Course Objective:

- To learn about quality attributes and their evaluation.
 - To learn about objective and subjective evaluation of foods
 - To learn total quality management systems
 - To understand the significance of various organizations and regulations involved in quality management.
- To understand various food safety standards

Course Outcome:

- CO1:** Upon completion of this course, students will be able to understand the principles and methods of Quality attributes.
- CO2:** Students will be able to understand the principles of sensory evaluation and have a practical knowledge of various methods to evaluate sensory analysis.
- CO3:** Students will be able to understand the principles and significance of quality control, quality assurance and total quality management along with HACCP in different food processing
- CO4:** Students will be able to gain knowledge on various Organizations & Regulations for Quality Management
- CO5:** Students will be able to gain knowledge on international Food Safety Standards

Course Content	Hours Allotted	Pedagogy
Module I: Title: Introduction to quality and quality attributes <ul style="list-style-type: none"> • Definition, Concept of Quality • Hazards-physical chemical and microbial • Quality attributes • Objective-physical - their measurement and evaluation • Chemical - their measurement and evaluation • Microbial -their measurement and evaluation • Food texture and its measurement 	(12) 1 2 1 2 2 2 2	Lecture Method using ICT Tools and chalk and talk
Module II: Title: Sensory Analysis <ul style="list-style-type: none"> • Sensory analysis: Introduction, general testing conditions • Requirements of sensory laboratory • Selection of sensory panelists • Factors influencing sensory measurements • Sensory evaluation tests: Detection, threshold and dilution tests • discrimination, descriptive, affective • Flavor profile tests, Computer-aided sensory evaluation of food & beverage 	(12) 2 1 2 1 2 1 3	Lecture Method using ICT Tools and chalk and talk



<p>Module III: Title: Concepts of QC, QA & Quality Management</p> <ul style="list-style-type: none"> • Total Quality Management • Quality control-Objectives, importance and functions • Quality assurance-Objectives, importance and functions • FSMS (ISO 22000) • Prerequisite programs (PRP), CCP, Operational Prerequisite programs (OPRP) • HACCP1 • GMP,GHP: GLP, GAP • Sanitary and hygienic practices 	<p>(12)</p> <p>2 1 1 2 2 1 1 1 1</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>
<p>Module IV: Title: Organizations & Regulations for Quality Management</p> <ul style="list-style-type: none"> • Organizations dealing with inspection, traceability and authentication • certification and quality assurance • FSSAI, AGMARK, BIS, Domestic regulations • Laboratory quality procedures: sampling plans and techniques • Assessment of laboratory performance 	<p>(12)</p> <p>2 2 2 1 1 2 1</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>
<p>Module V: Title: Global Food Safety Standards</p> <ul style="list-style-type: none"> • Global Food Safety Initiative • Quality manuals, international quality systems, and standards • ISO and Food Codex; Export import policy, export documentation • Food adulteration and food safety documentation and audits • Labelling issues: International scenario • International food standards 	<p>(12)</p> <p>2 2 2 4 1 1</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>

Learning Resources

1.	Principles of Sensory Evaluation of Food. Amerine, M.A. Pangborn, R.M. and Rosslos, E.B. 1965 London: Academic Press
2.	Guide to Quality Management Systems for Food Industries. London: Blackie Academic publications Early, R.1995
3.	Quality Control in Food Industry. Volume: I and II. Krammer, A. and Twigg, B.A New York: AVI Publications, 1973
4.	Handbook of Analysis and Quality Control for Fruit and Vegetable Products. 2 nd edition. Ranganna New Delhi: Tata-McGraw-Hill, 2001.



COURSE NAME
Energy Conservation & Auditing

Credits: 4
Course Code: MFT25306

Semester: III
No of Lecture Hours: 60

Course Objective:

- To impart knowledge on energy management, conservation processes, principles of energy auditing energy flow diagram, economics of energy conservation opportunities.
- To impart knowledge on the scope for energy conservation in electrical and thermal energy utilities.
- To impart knowledge on Energy Audit procedure along with relevant technologies/ tools and to develop Energy Audit Report writing skills
- To impart knowledge on Energy Conservation measures undertaken across different user segments using case studies and evaluating performance through benchmarking.
- To impart knowledge on the financial management in industries and measures taken to manage environmental pollution

Course Outcome:

CO1: Be able to understand the principles for conservation if energy and statues of energy utilization in food industries across the globe

CO2: Be able to understand the importance of energy conservation in different thermal utilities and recover the waste from industries to maintain sustainability

CO3: Be able to understand the process for energy audit and energy performance measures to employed to understand the efficiency in industry

CO4: Be able to understand the measures taken to maximize efficiency throughout energy systems.

CO5: Be able to understand fixed and variable costs, assess simple pay-back period and understand material and energy balances

Course Content	Hours Allotted	Pedagogy
Module I: Title: Introduction to Energy Conservation <ul style="list-style-type: none"> • Energy: Definition, sources, Forms • Energy Conservation: Basic Principles- Understanding Energy Efficiency and cost-effectiveness • General energy problem, Sector-wise Energy consumption, demand supply gap • opportunities of energy conservation in food processing industries • Status of energy utilization for food processing in India and abroad 	(6) 2 2 2 2 2	Lecture Method using ICT Tools and chalk and talk
Module II: Title: Energy conservation in thermal utilities	(6)	Lecture Method using ICT Tools



<ul style="list-style-type: none"> • Energy conservation in thermal utilities • fuel & combustion • boilers, steam system • furnaces, insulation & refrigeration • FBC boilers • Cogeneration principles 	<p>2 1 1 2 2 2</p>	<p>and chalk and talk</p>
<p>Module III: Title: Energy management & auditing I</p> <ul style="list-style-type: none"> • ISO:14000; EMS • Introduction to energy Management & Auditing-Types, Need of Audit • Energy audit instruments • Energy auditing methodology • Reporting format 	<p>(12) 2 2 2 4 2</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>
<p>Module IV: Title: Energy management & auditing II</p> <ul style="list-style-type: none"> • Benchmarking- Definition, Need, Types. • Energy performance- Definition and methods to evaluate. • matching energy usage to requirements • fuel and energy substitution 	<p>(12) 3 3 3 3</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>
<p>Module V: Title: Energy management & auditing III</p> <ul style="list-style-type: none"> • Material & Energy balance • energy action planning • financial management • Carbon Credits • energy monitoring and targeting 	<p>(12) 2 2 2 2 2</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>

Learning Resources

1.	Energy Management: Challenges for the Next Millennium. Energy Conservation through Waste Utilization Chaturvedi, P... New York: American Society of Mechanical Engineers. 2000
2.	Energy Management and Conservation Hand Book. Kreit, F. and Goswami, D.Y. New Delhi: 2008, CRC Press.
3.	Energy Management .Murphy, W.R and Mckay, G. 1982. New Delhi: BS Publications.
4.	Energy Management and Conservation. Patrick, D.R. 1982. Netherlands: Elsevier Publications.



COURSE NAME
Food Supply & Cold Chain Management

Credits: 4**Course Code: MFT25307****Semester: III****No of Lecture Hours: 60****Course Objective:**

- Present scenario in food supply- local and global aspects
- Technologies adapted for safety and security of food during supply
- Problems associated with local, regional and international supply.
- Supply chain performance measurement
- Application of innovation and IT frameworks in the food supply chain

Course Outcomes:

CO1: Evaluate the food chain from the perspective of the producer and the consumer

CO2: Understand when an FSC is sustainable and contributes to food safety and security

CO3: Assess the environmental, social, economic and cultural effects of different types of FSC.

CO4: Understand the inventory of Food Supply Chain (FSC)

CO5: Analyze opportunities for innovation in food supply chains and opportunities for application in practice.

Course Content	Hours Allotted	Pedagogy
Module I: Title: Basic Concepts in Cold Supply Chain <ul style="list-style-type: none"> • Fundamentals of Food supply chain design • Introduction, status, scope, and importance of cold chain in food processing Industry. • Major Cold chain technologies used in food industries. • Retail chain, components of cold chain and integration • Products going in cold chain • Temperature and humidity requirements • Quality & safety of chilled & frozen foods • Stages and points of control in cold storages and structures 	(12) 1 1 1 2 2 1 2 2	Lecture Method using ICT Tools and chalk and talk
Module II: Title: Storage and Marketing Strategies in Cold chain <ul style="list-style-type: none"> • Packaging needs and their compatibility in cold chain • functions in cold storages • pallet layout and stacking options • Flexibility storage systems cold chain transportation in land • Export, retail & supermarket cold chain & display systems • Internet auctions • E-market • Electronic business process optimization 	(12) 1 1 2 2 2 1 1 2	Lecture Method using ICT Tools and chalk and talk
Module III: Title: Risk Management and Transportation <ul style="list-style-type: none"> • Temperature recording devices used during transport 	(12) 2	Lecture Method using ICT Tools



<ul style="list-style-type: none"> documentation and traceability Risk management problem diagnosis cost benefit studies for type of transport loading & unloading, storage duration 	<p>2 3 3 2</p>	<p>and chalk and talk</p>
<p>Module IV: Title: Supply chain Models-I</p> <ul style="list-style-type: none"> Building blocks of supply chain network performance measures decisions in supply world and models Supply chain inventory management economic order quantity models recorder point models multi echelon inventory systems 	<p>(12) 3 2 1 2 2 1 1</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>
<p>Module V: Title: Supply chain Models-II Use of stochastic models and combinatorial optimization in;</p> <ul style="list-style-type: none"> o SC planning, layout o capacity planning o inventory optimization o dynamic routing and scheduling <p>Internet technologies and electronic commerce in SCM related to</p> <ul style="list-style-type: none"> o ERP o Q-procurement <ul style="list-style-type: none"> e-logistics 	<p>(12) 2 2 2 2 2 1 1</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>

Learning Resources	
1.	Introduction to Supply Chain Management , Handfield, R.B. and Nochols, E.L. 1999
2.	Supply Chain Management: Strategy, Planning and Operation , Chopra, S. and Meindel, P. 2002.
3.	Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies , Levi, D.S. Kaminsky, P. and Levi, E.S. 2000.
4.	Performance Modeling of Automated Manufacturing Systems , Viswanadham, N & Narahari, Y. 1998.



**ADVANCES IN FOOD PACKAGING
PRACTICALS**

Credits : 2

II Year/Semester: III

Course Code : MFT25308

No. of Practical hours: 30

Course Objectives:

This course aims to provide practical knowledge of

- Types and properties of packaging materials used in food industries
- Methods employed to measure or test the quality of the packaging material

Course Outcomes:

Upon completion of this practical course, students will be able to

- Students can learn how to perform tests on packaging materials like bursting strength, tearing strength, drop test, density test and thermal resistance test
- Students can learn about the different types of packaging materials used for food, and the quality parameters required for each to provide a safe environment for the foods for longer storage.

Contents:

- Identification and testing of packaging materials 3
- Determination of equilibrium moisture content 2
- Grading of glass bottles-Thermal shock of glass bottles at high and low temperatures 3
- Determination of water vapor transmission rate of packaging material 2
- Types of cardboard and its determination. 2
- Determination of Grammage of packaging materials 2
- Development of biodegradable plastics and their testing 4
- Testing the compression strength of the boxes 2
- Packaging the food material in seal and shrink packaging machine and study its shelf life 4
- Testing the strength of glass containers by thermal shock test 2
- Testing the strength of filled pouches by drop tester 2
- Industrial visit to packaging industry 2

Recommended Readings:

- Crosby, N.T. 1981. Food Packaging: Aspects of Analysis and Migration Contaminants. London: Applied Science Publications.
- Kadoya, T.1990. Food Packaging. London: Academic Press.
- Mahadeviah, M. and Gowramma, R.V. 1996. Food Packaging Materials. New Delhi: Tata McGraw Hill.
- Palling, S.J. 1980. Developments in Food Packaging. London: Applied Science Publications.
- Painy, F.A. 1992. A Handbook of Food Packaging. London: Blackie Academic Publication.



**FOOD QUALITY SYSTEMS & MANAGEMENT
PRACTICALS**

Credits : 2

II Year/ Semester: III

Course Code : MFT25309

No. of Practical hours: 30

Objective:

- To understand quality policy and documentation of food sectors.
- To test and evaluate quality attributes of foods.
- To evaluate sensory parameters of food.

Outcome:

- Students will gain knowledge about quality policy and documentation
- Students will gain knowledge on testing and evaluation of quality attributes of foods.
- Students will learn sensory evaluation of foods

Contents:

- | | |
|---|---|
| • Testing and evaluation of quality attributes of raw and processed foods | 4 |
| • Sensory evaluation of foods | 2 |
| • Quality assurance procedure, GMP, GAP documentation | 2 |
| • Preparation of quality policy & documentation | 2 |
| • Application of HACCP to products | 2 |
| • Preparation of HACCP chart | 2 |
| • Preparation of documentation & records | 2 |
| • Visit to Units with HACCP certification | 2 |
| • Mini project on preparation of a model laboratory manual | 8 |

Recommended Readings:

- Amerine, M.A. Pangborn, R.M. and Rosslos, E.B. 1965. Principles of Sensory Evaluation of Food. London: Academic Press.
- Early, R. 1995. Guide to Quality Management Systems for Food Industries. London: Blackie Academic publications.
- Krammer, A. and Twigg, B.A. 1973. Quality Control in Food Industry. Volume: I and II. New York: AVI Publications.
- Macrae, R. Roloson, R. and Sadlu, M.J. 1994. Encyclopedia of Food Science & Technology & Nutrition. Volume: XVI. London: Academic Press.
- Ranganna, S. 2001. Handbook of Analysis and Quality Control for Fruit and Vegetable Products. 2nd edition. New Delhi: Tata-McGraw-Hill.



Year-Wise and Semester-Wise Distribution of Courses
Department of M.Sc. Food Technology & Management
Fourth Semester
Academic Year 2025-2026 Batch 2024-2026 (CBCS)

S. No	Part	Subject Code	Title of the Subject	Hours /Week	Duration of Exam (hrs)	Marks			Credits
						Internal	External	Total	
1	II	MFT2540 1 A/ MFT2540 1 B	Nutraceuticals & Functional Foods / Food Toxicology & Allergens (DSE- 2)	4	3	40	60	100	4
2	II	MFT2540 2	New Food product development (Core – 15)	4	3	40	60	100	4
PRACTICALS									
3	II	MFT2540 3(P)	New Food Product Development	4	3	40	60	100	2
4	II	MFT2540 4 (P)	Project Work/Industry Internship	24		40	60	100	6
TOTAL				36		160	240	400	16

- Discipline Specific Elective (DSE)
- CIA components for internal marks of theory paper: (i) Weekly test: 5M (ii) Mid Sem: 10 M (iii) Prefinal: 16M (iv) Assignment: 2M (v) Viva: 2M (vi) Attendance: 4M
CIA components for practical Internal marks: (i) Attendance / Record 5M (ii) Practical skill: 10M (iii) Prefinal: 15M

Prof. Brandon Manoj
 Head, Department of M.Sc. Food Technology & Management
 Loyola Academy Degree & PG College, Alwal, Secunderabad 500 010



COURSE NAME
Nutraceuticals & Functional Foods

Credits: 4

Course Code: MFT25401/A

Semester: IV

No of Lecture Hours: 60

Course Objective:

- To impart knowledge on various nutraceuticals and functional foods as active ingredients.
- To impart knowledge on different foods and its remedies.
- To impart knowledge on nutraceuticals rich supplements.
- To impart knowledge on various Phytochemicals and antioxidants and its mechanism.
- To impart knowledge on different foods, its active ingredients and sources

Course Outcome:

CO1: Be able to understand the basic concepts of nutraceuticals and functional foods

CO2: Be able to gain knowledge about various foods and its roles as remedies for disorders

CO3: Be able to know Properties, structure and functions of various Nutraceuticals

CO4: Be able to gain concept about different phytochemicals and antioxidants

CO5: Be able to gain knowledge about roles and sources of food as remedies

Course Content	Hours Allotted	Pedagogy
Module I: Title: Introduction to Nutraceuticals as science <ul style="list-style-type: none"> • Functional foods and Nutraceuticals terminology • Historical perspective and classification of functional foods and Nutraceuticals • The food industry's role in promoting functional foods • The role of marketing Communication in the introduction of functional foods to the consumer • Sources of functional foods and Nutraceuticals • Nutritive and Non-Nutritive food components. 	(12) 2 2 2 2 2 2	Lecture Method using ICT Tools and chalk and talk
Module II: Title: Food as Remedies <ul style="list-style-type: none"> • Relation of functional foods & Nutraceutical (FFN) to foods & drugs • Applications of herbs to functional foods • Functional foods and Nutraceuticals remedies for common disorders like Arthritis, Bronchitis, circulatory problems, hypoglycemia • Nephrological disorders, Liver disorder • Probiotics and prebiotics • Polyunsaturated fatty acids, lecithin • Cognitive decline, Dementia 	(12) 2 2 2 2 1 1	Lecture Method using ICT Tools and chalk and talk



<p>Module III: Title: Properties, structure and functions of various Nutraceuticals</p> <ul style="list-style-type: none"> • Brief idea about some Nutraceutical rich supplements • Soy proteins and soy isoflavones in human health • Bee pollen, Caffeine, Green tea, • Lecithin, Mushroom extract, • Chlorophyll, Kelp and <i>Spirulina</i> • Role of Dietary fibers in disease prevention. • Novel nutraceuticals 	<p>(12) 2 2 2 2 2 2</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>
<p>Module IV: Title: Phytochemicals and antioxidants</p> <ul style="list-style-type: none"> • Effect of Functional foods on Immune system • Antioxidant system of the human organism • Free radical mechanism • Cardiovascular diseases • Types of cancer • Osteoporosis • Psoriasis and Ulcers 	<p>(12) 2 2 1 2 2 1 2</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>
<p>Module V: Title: Roles and sources of food as remedies</p> <ul style="list-style-type: none"> • Vegetables, Cereals, milk and dairy products as Functional foods • Use of proanthocyanidins, grape products, flaxseed oil as Nutraceuticals • Glucosamine, Lycopene and Melatonin • Health effects of common beans, <i>Capsicum</i>, mustards, Ginseng, • Health effects of garlic, grape, citrus fruits, fish oils, and sea foods • Nutrigenomics, food omics: definition, benefits 	<p>(12) 2 2 2 2 2 2</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>

Learning Resources	
1.	<i>Functional Foods and Nutraceuticals</i> , Aluko, Rotimi E, 2012
2.	<i>Handbook of Nutraceuticals and Functional Foods</i> , Robert, E.C, 1st Edition, Kindle Edition
3.	<i>Functional Foods and Nutraceuticals</i> , Casimir C. Akoh



COURSE NAME
Food Toxicology and Allergens

Credits: 4

Course Code: MFT25401/B

Semester: IV

No of Lecture Hours: 60

Course Objective:

- To impart knowledge of the scope and basic principles of food toxicology.
- To understand the mechanism of Allergens.
- To gain knowledge of toxic substances in food and their toxic effects in people.
- To impart knowledge on qualitative and quantitative toxicity testing.
- To understand the mode of action of various toxins formed during food processing

Course Outcome:

CO1: Ability to analyze the various hazards caused in food and immune responses

CO2: Ability to understand the effect of various food allergens

CO3: To acquire knowledge about various types of natural food toxicants and their GI absorption

CO4: To identify and apply appropriate qualitative and quantitative methods for the analysis of xenobiotics in a variety of food

CO5: Appraise critically the source of potential toxic constituents in food such as toxicants formed during processing (intentionally added or naturally occurring)

Course Content	Hours Allotted	Pedagogy
Module I: Title: Basic Principles of Toxicology <ul style="list-style-type: none"> • Definition and need for understanding food toxicology Principles of toxicology, ADME <ul style="list-style-type: none"> a) Toxin absorption in the gastrointestinal tract b) Distribution c) Metabolism d) Excretion of toxicants • Biological factors that influence toxicity 	(12) 3 1 2 1 2 3	Lecture Method using ICT Tools and chalk and talk
Module II: Title: Food allergy and mechanism <ul style="list-style-type: none"> • Basics of immune response - humoral and cell-mediated responses • Allergen and mechanism of allergens • Celiac disease. • Food disorders associated with metabolism. • Lactose intolerance. • Asthma 	(12) 2 2 2 2 2 2	Lecture Method using ICT Tools and chalk and talk
Module III: Title: Natural food toxicants <ul style="list-style-type: none"> • Classification of natural toxins in food • Toxicity of mushroom alkaloids • Toxicants of seafood • Toxicants of vegetables & fruits • Toxicants of cereals & pulses • antinutritional compounds. 	(12) 2 2 2 2 2 2	Lecture Method using ICT Tools and chalk and talk
Module IV: Title:	(12)	Lecture Method



<ul style="list-style-type: none"> • Assessment of food safety: <ul style="list-style-type: none"> ○ Risk assessment and risk-benefit indices of human exposure ○ Quantitative and qualitative analysis of toxicants in food • Biological determination of toxicants <ul style="list-style-type: none"> ○ Acute toxicity ○ Mutagen city and carcinogenicity ○ Reproductive and developmental toxicity, ○ Neurotoxicity and behavioral effect. ○ Immunotoxicity. 	2 3 1 2 2 1 1	using ICT Tools and chalk and talk
<p>Module V: Title: Toxicants formed during food processing:</p> <ul style="list-style-type: none"> • Intentional direct additives, preservatives, ,flavor enhancers, food colors • Indirect additives, Xenobiotic compounds heavy metals, other organic residues and packaging materials. • Toxicity of heated and processed foods, • Food carcinogens and mutagens <ul style="list-style-type: none"> ○ Polycyclic aromatic hydrocarbons ○ N – nitrosamines • Acrylamide and their mode of action 	(12) 2 4 2 2 2	Lecture Method using ICT Tools and chalk and talk

Learning Resources	
1.	Food Toxicology , Helferich, William and Carl, K. 2001
2.	Introduction to Food Toxicology , Shibamoto, Taka yuki and Leonard, F. 2009, 2 nd edition
3.	Food Allergy , Maleki, Soheila J. A. Wesley Burks, and Ricki M.Helm. 2006
4.	Food Borne Infections and Intoxications , Hans, P. and Dean, 3 rd edition.



COURSE NAME
New Product Development

Credits: 4
Course Code: MFT25402

Semester: IV
No of Lecture Hours: 60

Course Objective:

- To understand the concept of development of a new product
- To impart knowledge on preparation of new product based on special dietary requirements, functionality, convenience.
- To be able to understand the improvisation of existing traditional Indian foods.

Course Outcome:

- CO1:** Explain the concept involved in food product development
CO2: Demonstrate various stages of food product development
CO3: Identify the role and behaviour of consumers in food product development
CO4: Explain the design and management of the product development process
CO5: Create awareness of improving product success

Course Content	Hours Allotted	Pedagogy
Module I: Title: Introduction to Product Development <ul style="list-style-type: none"> • Food products concept • Measures of product success and failure, factors for success • Managing product success and Product development management • Stages of product development process • Innovation strategy - possibilities for innovation • Building up strategy and total innovative management 	(12) 2 2 2 2 2 2	Lecture Method using ICT Tools and chalk and talk
Module II: Title: Product Development Process <ul style="list-style-type: none"> • Product strategy • Developing the product concept • Stages and factors in Product design and process development • Product commercialization • Product launch and evaluation 	(12) 2 2 3 3 2	Lecture Method using ICT Tools and chalk and talk
Module III: Title: Role of Consumers in product development <ul style="list-style-type: none"> • Role of consumers in product development • Consumer behavior, food preferences, avoiding acceptance • Integration of consumer needs in product development • Sensory needs • People in product development management 	(12) 2 3 3 2 2	
Module IV: Title: Design & Management of Product Development Process	(6) 2	Lecture Method using ICT Tools



<ul style="list-style-type: none"> • Designing the product development process, key decision points • Establishing outcomes, budgets and constraints • Managing and organizing product development process • Knowledge for conversion of product concept to new product • Technological knowledge 	<p>2 2 2 2</p>	<p>and chalk and talk</p>
<p>Module V: Title: Entrepreneurship Development</p> <ul style="list-style-type: none"> • Entrepreneurship-Meaning, Function of Entrepreneur • Characteristics of successful Entrepreneur • Role of Entrepreneurship in economic development • Sources of finance- micro, small, medium Entrepreneurship • TSIPASS and PMFME 	<p>(12) 2 2 3 3 2</p>	<p>Lecture Method using ICT Tools and chalk and talk</p>

Learning Resources

1.	Creating New Foods , Earle and Earle, 2001.
2.	New Product Development- From Concept to Marketplace , Fuller. Gordon, W. 2004
3.	Entrepreneurship Development , Anil Kumar, S. Poornima, S.C. Abraham, M.K. and Jayashree, K. 2004.
4.	An Integrated Approach to New Food Product , Moskowitz, Howard and Saguy, R. I. 2009.



**NEW FOOD PRODUCT DEVELOPMENT
PRACTICAL**

Credits:2

II Year/Semester: IV

Course Code: MFT25403(P)

No. of Practical hours: 30

Course Objectives:

This course aims to provide practical knowledge of Market surveys, Cost analysis, Standardization of products, Development of new products, Consumer feedback studies

Course Outcomes:

Upon completion of this practical course, students will be able to

- Students can learn how to perform the Standardization of products, cost analysis, and marketing
- Students can learn about the development of new products, analysis, and consumer feedback.

Contents:

(30 Hrs)

1) Market survey of existing products	6
2) Idea generation and selection of topic	3
3) Development of new product	6
4) Standardization of product	2
5) Analysis of new products	2
6) Sensory evaluation	2
7) Cost analysis	3
8) Marketing	4
9) Consumer feedback studies	2

References :

1. Earle and Earle, 2001. **Creating New Foods**. U.K: Chadwick House Group.
2. Fuller. Gordon, W. 2004. **New Product Development- From Concept to Marketplace**. United States: CRC Press.
3. Anil Kumar, S. Poornima, S.C. Abraham, M.K. and Jayashree, K. 2004. **Entrepreneurship Development**. New Delhi: New Age International Publishers.
4. Moskowitz, Howard and Saguy, R. I. 2009. **An Integrated Approach to New Food Product**. United States: CRC Press.
5. .Clarke and Wright, W. 1999. **Managing New Product and Process Development**. India: Free Press.



PROJECT WORK/INDUSTRIAL INTERNSHIP

Credits : 6

II Year/Semester: IV

Course Code : MFT25404(P)

Objective:

- To conduct research and project writing skills by students.

Outcome:

- Students get hands-on experience related to different aspects of new Product development, food standards and regulations and usage of various equipments and machineries.

A research project will be allotted to each student in the IV semester with regular internal assessment. They will be required to complete the data collection, analysis and writing of the dissertation to submit and present a seminar at the end of the IV Semester.