MGM UNIVERSITY, CHH. SAMBHAJINAGAR

INSTITUTE OF BIOSCIENCES AND TECHNOLOGY

CHOICE BASED CREDIT SYSTEM (CBCS)

SEMESTER PATTERN

Faculty of Sciences

Post Graduate (PG) progrmme

Food Technology - CURRICULUM

w. e. f. Academic Year 2023-24

M.Sc. Food Technology

CURRICULUM

Prepared By
Dr. R. R. Patil

Submitted By
Dr. G. W. Narkhede

Approved By
Board of Studies

MGM UNIVERSITY, CHH. SAMBHAJINAGAR

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FOOD TECHNOLOGY - CURRICULUM

w. e. f. Academic Year 2023-24

M.Sc. Food Technology

CURRICULUM:

Semester I

First Year - Semester I												
Course Category	**Course Code**	**Course Title**	**Nature of Course**	**No. of Credits**	**Teaching (Contact hrs/ week)**		**Evaluation Scheme (Marks)**			**Minimum Passing (Marks)**		
					L	**P**	**Internal**	**External**	**Total**	**Internal**	**External**	**Total**
MM	**MFT42MML501**	Food Chemistry and Nutrition	**L**	3	3	-	60	40	100		16	40
MM	**MFT42MML502**	Food Preservation Technology	**L**	3	3	-	60	40	100		16	40
MM	**MFT42MML503**	Food Engineering	**L**	3	3	-	60	40	100		16	40
MM	**MFT42MML504**	Food Packaging Technology	**L**	3	3	-	60	40	100		16	40
MM	**MFT42MMJ501**	Mini Project	**J**	2	-	4	30	20	50		8	20
ME	**MFT42MEP501**	Product Innovation -I Lab (Practical)	**P**	2	-	4	30	20	50		8	20
	MFT42MEP502	Lab In Food Product Development and International Trade										
ME	**MFT42MEP503**	Food science Lab	**P**	2	-	4	30	20	50		8	20
	MFT42MEP504	Pre and Post Harvest Technology of Fruits and Vegetable										
RM	**MFT42RML501**	**Research Methodology**	**L**	4	4	-	60	40	100		16	40
		Total		**22**	**16**	**12**			**650**			**260**

Note:

Nature of Course : L- Lecture, P-Practical, S-Seminar, J-Project, I-Internship, D-Dissertation,

Course Category: MM-Major Mandatory, ME-Major Elective, MI-Minor, OE-Generic / Open electives, VSC-Vocational skill course, SEC-Skill Enhancement course, AEC-Ability Enhancement course, IKS-Indian Knowledge system, VEC-Value Education course, OJT-On Job Training / Internship / Apprenticeship, FP-Field project, CEP-Community engagement and service, CC-Co – curricular course, RM-Research methodology, RP-Research project

SYLLABUS STRUCTURE SHEET

FOOD CHEMISTRY & NUTRITION

University:MGM University, CHH. SAMBHAJINAGAR	**Faculty:** Basic & Applied Science
Institute: Institute of Biosciences and Tech.	**Degree: M.Sc.** Food Technology(PG)
Course Code: MFT42MML501	**Course Title: Food Chemistry & Nutrition**
Credits allocated: 3+0 (3 Theory+0 Practical)	**Level of Study: PG**

Mode of delivery, planned learning activities and teaching method: Lecture 3hrs weekly

Recommended Year/Semester: Food Tech. & Processing Master's of Science, Year1/Semester1

Prerequisites for registration: Registration of a student in various courses in consultation with the respective course teacher and Adviser and acceptance by the principal. The approved courses must be mentioned in the roster form. Candidate should pass in under graduate life science.

Learning Outcome :

Upon successful completion, students will have the knowledge and skills to:

A thorough explaining of the -The subject imparts basic knowledge of Food chemistry & Nutrition process. This information will make the student competent in Food chemistry &nutrition process

OBJECTIVE:

- To acquaint with properties and role of various constituents in foods, interaction andchanges during processing.
- To acquaint with importance of various foods and nutrients in human nutrition.

COURSE CONTENT
THEORY
Total Lectures = 45

Unit -I Introduction of food chemistry – (8 Lectures)

Food chemistry- definition, scope and importance; water in food, water activity and shelf life of food; chemistry and stability of water and fat soluble vitamins; chemical properties of minerals and their bioavailability, enrichment and fortification.

UNIT-II Carbohydrates Proteins and Lipids – (10 Lectures) Carbohydrates, proteins and lipids: classification, physical, chemical, nutritional, and functional properties and their structural correlations; auto-oxidation of lipids and rancidity

UNIT-III Minor constituents in food– (9 Lectures)

Properties of minerals, vitamins, pigments, anti-oxidants, flavour components, allergens, toxins and anti-nutritional factors in foods; Interaction of constituents in food systems; Changes during storage and processing; Browning reactions in foods.

UNIT-IV Food groups and their typical composition– (10 Lectures)

Food groups and their typical composition; essential nutrients- sources, functions, deficiency diseases; requirements and recommended dietary allowances; digestion, absorption, transport and metabolism o f nutrients inhuman system; protein quality evaluation.

UNIT- V Enzymes– (8 Lectures)

Enzyme: Classification, Nomenclature, application of enzyme in food industry.

Suggested Reading/Reference Books/Text Books :

1. Bamji MS, Rao NA & ReddyV.2003.Textbook of Human Nutrition.Oxford & IBH.
2. Belitz HD.1999.Food Chemistry.Springer Verlag.
3. De Man JM.1976.Principles of FoodChemistry.AVI.
4. MeyerLH.1987.FoodChemistry.CBS.
5. Alias C. and Lindeu G (1991) Food Biochemistry, Ellis Horwood, NewYork
6. Pomeranz, Y and Meloon, R. (1995) Food Analysis: Theory and Practice, Westport, An AVI Publication, New York, Sydney, Toronto.
7. Fennema, R.O (1997) Food Chemistry, Second Edition, Food Science & Technology series, Marcel Dekker, INC., New York

SYLLABUS STRUCURE SHEET
FOOD PRESERVATION TECHNOLOGY

University:MGM University, CHH. SAMBHAJINAGAR	**Faculty:** Basic & Applied Science
Institute: Institute of Biosciences and Tech.	**Degree: M.Sc.** Food Technology(PG)
Course Code: MFT42MML502	**Course Title:** Food Preservation Technology
Credits allocated: 3+0 (3 Theory+0 Practical)	**Level of Study: PG**

Mode of delivery planned learning activities and teaching method: Lecture 3hrs weekly

Recommended Year/Semester: Food Tech & Processing – Masters of Science, Year 1st / Semester

Prerequisites for registration: Registration of a student in various courses in consultation with the respective course teacher and Adviser and acceptance by the principal. The approved courses must be mentioned in the roster form. Candidate should pass in under graduate life science.

Learning Outcome:

Upon successful completion, students will have the knowledge and skills to: A thorough explaining of the -historical developments, principles & Scope of food processing; Use and application of enzymes and microorganisms in processing and preservation of foods

Objective

To acquaint with principles of different techniques used in processing and preservation of foods.

COURSE CONTENT

THEORY

(45 Lectures)

UNII-I Food Processing and Preservation -(8 Lectures)

Scope of food processing; historical developments; principles of food processing and preservation.

UNIT- II Preservation of Food by Heat -(10 Lectures)

Processing and preservation by heat – blanching, pasteurization, sterilization and UHT processing, canning, extrusion cooking, dielectric heating, microwave heating, baking, roastingand frying, etc

UNIT- III Preservation by low-temperature -(9 Lectures)

Introduction to processing and preservation by low-temperature-refrigeration, freezing,

CA,MA and dehydro-freezing.

UNIT – IV Processing and preservation by drying (9 Lectures)

Introduction to Processing and preservation by drying, concentration and evaporation- types ofdryers and their suitabilityfor different food products; ultra- filtration, reverse osmosis.

UNIT – V Processing and preservation by non-thermal methods (9 Lectures)

Introduction to Processing and preservation by non-thermal methods, irradiation, high pressure,pulsed electric field, hurdle technology.

Suggested Reading/Reference Books/Text Books

1. Arsdel WB, Copley MJ & Morgan AI. 1973. Food Dehydration. 2 nd Ed. Vols. I, II.AVIPubl.
2. Desrosier NW & James N.1977. Technology of Food Preservation. 4 th Ed.AVI. Publ.
3. Fellows PJ. 2005. Food Processing Technology: Principle and Practice. 2 ndEd. CRC.
4. Jelen P. 1985. Introduction to Food Processing. Prentice Hall.
5. Potter NN & Hotchkiss 1997. Food Science. 5 th Ed. CBS.
6. Potty VH & Mulky MJ. 1993. Food Processing. Oxford & IBH.
7. Ramaswamy H & Marcotte M. 2006. Food Processing: Principles and applications.Taylor& Francis.

SYLLABUS STRUCTURE SHEET

FOOD ENGINEERING

University: MGM University, CHH. SAMBHAJINAGAR

Faculty: Basic & Applied Science

Institute: Institute of Biosciences and Tech.

Degree: M.Sc. Food Technology(PG)

Course Code: MFT42MML503

Course Title: Food Engineering

Credits allocated: 3+0 (3 Theory+0 Practical)

Level of Study: PG

Mode of delivery, planned learning activities and teaching method: Lecture 3hrs weekly

Recommended Year /Semester: Food Tech. & Processing -Master's of Science, Year 1 /Semester1

Prerequisites for registration: Registration of a student in various courses in consultation with the respective course teacher and Adviser and acceptance by the principal. The approved courses must be mentioned in the roster form. Candidate should pass in under graduate life science.

Learning Outcome :

Upon successful completion, students will have the knowledge and skills to: The main purpose of the subject is to understand basic principle of Food Engineering and its Processes. Introduction to food engineering & processes, Kinetics of biological reactions, Method for thermal process evaluation, Food chilling and freezing, Process Heat Transfer

OBJECTIVE :

To acquaint with basic principle of Food Engineering and its Processes, with importance of various foods process and their evaluation

COURSE CONTENT

THEORY

UNIT – I Introduction to food engineering & processes (8 Lectures)

Introduction to food engineering & processes: principles of thermodynamics and heat transfer applied to food engineering; fundamentals of heat and analogy to mass transfer in food processing.

UNIT- II Method for thermal process evaluation (10 Lectures)

Method for thermal process evaluation - Commercial sterility, pasteurization and sterilization methods based on slowest heating region, heat exchangers; general introduction to aseptic canning process, hydrostatic sterilizer and aseptic packaging practices and design problems.

UNIT – III Food chilling and freezing (10 Lectures)

Food chilling and freezing – Pre-cooling and cold storage; CA and MA; Properties of frozen

foods; freezing point depression; general introduction to enthalpy change during freezing; Plank's equation for predicting rates of product freezing; Cryogenic freezing and IQF; design of food freezing equipment such as air blast freezers, plate freezers and immersion freezers.

UNIT-IV Heat Transfer (9 Lectures)

Process Heat Transfer - Modes of heat transfer and overall heat transfer; thermal properties of foods such as specific heat and thermal conductivity; Fourier's law, steady state and unsteady state conduction; heat exchange equipment; energy balances; rate of heat transfer;

UNIT-V Mass Transfer -(8 Lectures)

Introduction about mass transfer, important process in mass transfer, application of mass transferin food industry.

Suggested Reading/ Reference Books/ Text Books :

1. Brennan JG, Butter JR, Corell ND & Lilly AVE. 1990. Food Engineering Operations.Elsevier.
2. Charm SE, McCabe WL, Smith JC & Harriott P.1993. Unit Operations of ChemicalEngineering.McGraw Hills.
3. Earle RL. 1985. Unit Operations in Food Processing. Pergamon Press.
4. Fellows P. 1988. Food Processing Technology. VCH Ellis Horwood.
5. Heldman DR & Singh RP.1995. Food Process Engineering. AVI Publ.
6. McCabe WL & and Smith JC. 1971. Fundamental of Food Engineering. AVI Publ.
7. Sahay KM & Singh KK. 1994. Unit Operation of Agricultural Processing.Vikas Publ.House.
8. Singh RP & Heldman DR. 1993. Introduction to Food Engineering. Academic Press.

SYLLABUS STRUCTURE SHEET

FOOD PACKAGING TECHNOLOGY

University: MGM University, CHH.SAMBHAJINAGAR

Faculty: Basic & Applied Science

Institute: Institute of Biosciences and Tech.

Degree: M.Sc. Food Technology(PG)

Course Code: MFT42MML504

Course Title: Food PackagingTechnology

Credits allocated: 3+0 (3 Theory+0 Practical)

Level of Study: PG

Mode of delivery, planned learning activities and teaching method: Lecture 3hrs weekly

Recommended Year/Semester: Food Tech. & Processing-Master's of Science, Year1/Semester I

Prerequisites for registration: Registration of a student in various courses in consultation with the respective course teacher and Adviser and acceptance by the principal. Theapproved coursesmust be mentioned in the roster form. Candidate should pass in under graduate life science.

Learning Outcome

Upon successful completion, students will have the knowledge and skills to: Active and intelligent packaging, Non-migratory bioactive polymers (NMBP) in food packaging, Time-temperature indicators, Packaging-flavor interactions Course designed to impart advanced knowledge and skills required to learn various aspects of food packaging technology at food industries

Objective

To provide knowledge about selected trends and development in food packaging technologies and materials aiming at assuring the safety and quality of foodstuffs in order to design an optimized package which satisfies all legislative, marketing and functional requirements sufficiently, and fulfils environmental, cost and consumer demands as well as possible.

COURSE CONTENT

THEORY

UNIT I Introduction of food Packaging and Type (9 Lectures)

Active and intelligent packaging, Active packaging techniques, Intelligent packagingtechniques,Current use of novel packaging techniques, Oxygen, ethylene and other scavengers, Oxygen scavenging technology, Ethylene scavenging technology, Carbon dioxide and other scavengers, Antimicrobial foodpackaging: Constructing an antimicrobial packaging system, Factors affecting the effectiveness of antimicrobial packaging.

UNIT II Non-migratory bioactive polymers (8 Lectures)

Non-migratory bioactive polymers (NMBP) in food packaging, Advantages of NMBP, limitations, inherently bioactive synthetic polymers: types and applications, Polymers with immobilized bioactive compounds.

UNIT III Important Parameter in food packaging (9 Lectures)

Time-temperature indicators (TTIs), Defining and classifying TTIs, Requirements for TTIs, The development of TTIs, Current TTI systems, Maximizing the effectiveness of TTIs, Using TTIs to monitorshelf-life during distribution, Using TTIs to optimize distribution and stock rotation.

UNIT IV Innovative Packaging (9 Lectures)

Packaging-flavour interactions, Factors affecting flavour absorption, role of the food matrix, role of differing packaging materials, Case study: packaging and lipid oxidation, Modeling flavour absorption, Packaging– flavour interactions and active packaging, Novel MAP applications for fresh-prepared produce, Novel MAP gases, Testing novel MAP applications, Applying high O 2 MAP.

UNIT V Materials and Application of food packaging (10 Lectures)

Modern packaging systems: Green plastics for food packaging, The problem of plastic packaging waste, The range of biopolymers, Developing novel biodegradable materials, Legislative issues, Current applications, Integrating intelligent packaging , role of packaging in the supply chain, Creating integrated packaging, storage and distribution: alarm systems and TTIs, Traceability: radio frequency identification, Recycling packaging materials: The recyclability of packaging plastics, Improving the recyclability of plastics packaging, Testing the safety and quality of recycled material, Using recycledplastics in packaging.

Suggested Reading/ Reference Books/ Text Books

1. Ahvenainen R. 2001. Novel Food Packaging Techniques. CRC.
2. Crosby NT. 1981. Food Packaging Materials. App. Sci. Publ.
3. Mahadeviah M & Gowramma RV. 1996. Food Packaging Materials. Tata McGraw Hill.
4. Painy FA. 1992. A Handbook of Food Packaging. Blackie.
5. Palling SJ. 1980. Developments in Food Packaging. App. Sci. Publ.
6. Rooney ML. 1988. Active Food Packaging. Chapman & Hall.
7. Sacharow S & Griffin RC.1980. Principles of Food Packaging. AVI Publ.
8. Stanley S & Roger CG. 1998. Food Packaging. AVI Publ.

SYLLABUS STRUCTURE SHEET

MINI PROJECT

University: MGM University, CHH. SAMBHAJINAGAR

Faculty: Basic & Applied Science

Institute: Institute of Biosciences and Tech.

Degree: M.Sc. Food Technology(PG)

Course Code: MFT42MMJ501

Course Title: Mini Project

Credits allocated: 0+2

Level of Study: PG

Mode of delivery planned learning activities and teaching method: Practical 4 hrs / weekly

Recommended Year /Semester : Food Tech. & Processing-Master's of Science,Year1/Semester I

Prerequisites for registration: Registration of a student in various courses in consultation with the respective course teacher and Adviser and acceptance by the principal. The approved coursesmust be mentioned in the roster form. Candidates should pass in undergraduate Life Science.

Course Outcomes:

1. Students will be able to practice acquired knowledge within the chosen area of technologyforproject development.
2. Identify, discuss and justify the technical aspects of the chosen project with a comprehensiveandsystematic approach.

PROCEDURE

SN	Activities	Responsibilities
1	PG students are decide on thire team members for their semester project with their proposed project domain and title	Project head, PG students
2	Director shall allocate the project guide based on their area of expertise (ot more than 3 batches to a guide)	Director
3	Ensuring that students have regular discussion meetings with their project guides.	Project guide Project head
4	Synopsis preparation and submission	Project head
5	Verification of student project log book	Project guide Project head

6	Approval of PPT : Abstract,existing, proposed system.30% of proposed work. 80% of proposed work. 100% of proposed work.	Project guide
7	Preparation and submission of progress report during project	Students Project head
8	Preparaing list for Redo students (insufficient content, plagiarism, poor presentation, genuiene absentees.	Project head
9	Submission of hard copy of project report	Project head
10	Evaluation of project report	External examiner
11	Organizing final project viva-voce	Project heads
12	Ensuring that if a candidate fails to submit the project reporton or before the specified deadline , he/she is deemed to have failed in the project work and shall re – enroll for the same	Project head Project guide Director

SYLLABUS STRUCTURE SHEET

PRODUCT INNOVATION -I LAB

University: MGM University, CHH. SAMBHAJINAGAR	**Faculty:** Basic & Applied Science
Institute: Institute of Biosciences and Tech.	**Degree: M.Sc.** Food Technology(PG)
Course Unit Code: MFT42MEP501	**Course Unit Title:** Product Innovation -I Lab
Credits allocated: 0+2	**Level of Study: PG**

Mode of delivery planned learning activities and teaching method: Practical 4 hrs / weekly

Recommended Year /Semester: Food Tech. & Processing-Master's of Science, Year1/Semester I

Prerequisites for registration: Registration of a student in various courses in consultation with the respective course teacher and Adviser and acceptance by the principal. Theapproved courses must be mentioned in the roster form.

Candidates should pass in undergraduate Life Science.

COURSE CONTENT

PRACTICAL

1. Study of heat transfer analysis by conduction
2. Determination of thermal conductivity of solid food products
3. Study of centrifugal separation (cream separation from milk
4. Study of Reynolds number apparatus to predict the type of flow
5. Measurement of thickness of paper and paper board
6. Study of food packaging
7. Study and Importance of vacuum packaging
8. Study of edible food packaging
9. Study of freeze drying process
10. Formulation of protein energy rich product
11. Preparation of low-calorie food product
12. Fortification of iron in daily used products
13. Development of infant or weaning food
14. Development of geriatric food
15. Preparation of new product development for athletes
16. Preparation of specialty food using locally available food crop, fruit and vegetable
17. Preparation of law sodium food product
18. Preparation of fiber enriched convenience food
19. Preparation of flour-based confectionary
20. Isolation and purification of pectin from organic waste

21. Training of sensory panel.
22. To perform sensitivity tests for four basic tastes
23. To perform analytical and affective tests of sensory evaluation.
24. Recognition tests for various food flavors.
25. Sensory evaluation techniques for milk and milk products.
26. Flavor defects in milk
27. Extraction of pigments from various fruits and vegetables
28. Study the effect of temperature on food
29. Study the effect of pH on food
30. Study the effect of improper TSS on food

SYLLABUS STRUCTURE SHEET

LAB IN FOOD PRODUCT DEVELOPMENT AND INTERNATIONAL TRADE

University: MGM University, CHH. SAMBHAJINAGAR **Faculty:** Basic & Applied Science

Institute: Institute of Biosciences and Tech. **Degree:** M.Sc. Food Technology(PG)

Course Code: MFT42MEP502 **Course Title:** Lab In Food ProductDevelopment and International Trade

Credits allocated: 0+2 **Level of Study: PG**

Mode of delivery planned learning activities and teaching method: Practical 4 hrs / weekly

Pre-Requisites The student should have basic understanding of business and marketing

Objectives

1. To guide students towards developing a new food product
2. To enable students develop marketing strategies for a new food product

Pedagogy Experiments in the Laboratory and Reports

Learning Outcomes

1. The student will be able to develop their own food products
2. The student will gain knowledge in marketing and managing thesale of their product

COURSE CONTENT

PRACTICALS

1. Study Introduction of the concept of new product development
2. Market survey of existing various products.
3. Study the New product development process
4. Study the Screening of product concept on the basis of techno-economic feasibility
5. Formulation of new products based on corporate decision
6. Preparation of Protein energy rich food products,
7. Preparation of Low calorie (fat replacer) food product
8. Development of Low sodium content food product
9. Preparation of low Glycemic index-based food products
10. Preparation of high Glycemic index-based food products
11. Preparation of high Cholestrolemic index-based food products
12. Preparation of high Phytochemical based food products
13. Product development based on formulation depending on local sources/ technology.
14. New product development for Infant
15. New product development for weaning foods
16. New product development for Geriatric
17. New product development for Physiological status
18. New product development for Athletes, sport person

19. Study the New Product policy and planning
20. Study the World trade organization
21. Study the world trade agreements related to food business
22. Study the export trends and prospects of food products in India
23. Study the imports trends and prospects of food products in India
24. Study the government institutions related to international food trade
25. Study the Agricultural and Processed Food Products Export Development Authority
26. Study the Marine Products Export Development Authority (MPEDA)
27. Study the Tea,Coffee Board
28. Study the Spice Board
29. Study the Ministry of Food Processing Industries
30. Study the trade Scenario of Indian Processed Food Industry

SYLLABUS STRUCTURE SHEET

FOOD SCIENCE LAB

University: MGM University, CHH. SAMBHAJINAGAR **Faculty:** Basic & Applied Science

Institute: Institute of Biosciences and Tech**.** **Degree:** M.Sc. Food Technology(PG)

Course Code: MFT42MEP503 **Course Title:** Food Science Lab

Credits allocated: 0+2 **Level of Study: PG**

Mode of delivery planned learning activities and teaching method: Practical 4 hrs / weekly

Recommended Year /Semester: Food Tech. & Processing Master's of Science,Year1/Semester II

Prerequisites for registration: Registration of a student in various courses in consultation with the respective course teacher and Adviser and acceptance by the principal. The approved coursesmust be mentioned in the roster form. Candidates should pass in undergraduate Life Science.

COURSE CONTENT

PRACTICALS

1. Physical-tests on wheat and rice
2. Physicochemical and rheological properties of food
3. Determination of gluten content in wheat flour
4. Conditioning of wheat
5. Milling of wheat and rice by laboratory mill.
6. Parboiling of rice
7. Quality tests of rice
8. Amylose content determination in rice
9. Malting of barley
10. Puffing and popping of grains.
11. Experimental parboiling and assessment of degree of polishing.
12. Preparation of protein concentrates and isolates
13. Evaluation for protein content and solubility of protein concentrate and isolate
14. Extraction of oil using expeller and solvent extraction methods.
15. Testing and evaluation of quality attributes of raw and processed foods.
16. Detection and estimation of food additives and adulterants
17. Studies of HACCP and its application to food products.

18. Studies of ISO 22000 for food industries.
19. Studies on FSSA 2006
20. To conduct mock audit for Institute or Industry.
21. Study of Good manufacturing practices
22. Study of Good hygienic practices
23. Study of Good laboratory practices
24. Study of Food safety management system
25. Preparation of quality policy & documentation.
26. Study the different packaging instruments.
27. Study of High-pressure processing
28. Study of Pulsed electric field processing
29. Study of ohmic heating process
30. Study of membrane filtration processing

SYLLABUS STRUCTURE SHEET

PRE AND POST HARVEST TECHNOLOGY OF FRUITS AND VEGETABLE

University: MGM University**,** CHH. SAMBHAJINAGAR

Faculty: Basic & Applied Science

Institute: Institute of Biosciences and Tech. **Degree:** M.Sc. Food Technology(PG)

Course Code: MFTMEP504

Course Title: Pre and Post Harvest Technology of Fruits andVegetable

Credits allocated: 0+2 **Level of Study: PG**

Mode of delivery planned learning activities and teaching method: Practical 4 hrs / weekly.

Pre-Requisites: The student should have knowledge of food chemistry

Objectives

To practically acquaint students with fundamental fruit and vegetableprocessing techniques

To familiarize students with quality control tests specific to the horticulture industry

Pedagogy: Experiments in the Laboratory

Learning Outcomes

1. The student will be able to prepare processed vegetable and fruitproducts
2. The student will gain an understanding of determining quality characteristics and acceptability parameters of horticulture produce.

COURSE CONTENT

PRACTICALS

1. Preparation of Vegetable Products
2. Preparation of Fruit Products
3. Preparation of Dehydrated Vegetables
4. Preparation of Banana and Potato Wafers
5. Preparation of Dried Figs and Raisins
6. Vegetable and Fruit Maturity Index Determination and Calculation
7. Quality Standard Measurements of Vegetable and Fruit Products
8. Study of minimal processing of f & v
9. Study of handling and transportation process for fresh harvest product
10. Study of fruit storage
11. Study of vegetable storage
12. Study of grain storage
13. Study of leafy veg. storage

14. Study of storage of root vegetable
15. Preservation by using salt (pickling)
16. Preservation by using chemical preservatives (sodium benzoate, calcium propionate)
17. Study of blancher, pasteurizers and Homogenizers
18. Preservation of food by using salt
19. Preservation of food by using chemicals
20. Preparation of RTS beverage
21. Preparation of squash
22. Preparation of cordial
23. Preparation of Jam
24. Preparation of jellies
25. Preparation of marmalade
26. Preparation of ketchup
27. Formulation of protein rich product
28. Preparation of low-calorie food product
29. Fortification of iron in daily used product
30. Development of infant/ weaning food

SYLLABUS STRUCTURE SHEET

Research Methodology

University: MGM University, CHH. SAMBHAJINAGAR	**Faculty:** Basic & Applied Science
Institute: Institute of Biosciences and Tech.	**Degree: M.Sc.** Food Technology(PG)
Course Unit Code: MFTRML501	**Course Unit Title:** Research Methodology
Credits allocated: 4+0	**Level of Study: PG**

Mode of delivery planned learning activities and teaching method: Practical4 hrs /weekly

Recommended Year /Semester: M.Sc. Plant Breeding & Molecular Genetics Year I/Semester I

Objectives:

- To get introduced to research philosophy and process in general
- To be able to formulate the problem statement and research plan for theproblemunderinvestigation
- To be able to apply various numerical/ quantitative techniques for data analysis
- To be able to communicate the research findings effectively

COURSE CONTENTS

THEORY

(Total Lectures = 60)

Unit I: (12 Lectures)

Introduction

Research Methodology: Introduction, Meaning of Research, Objectives of Research, Types of Research, Research Approaches, Significance of Research, Research Methods versus Methodology, Research and Scientific Method, Research Process, Criteria of Good Research, Problems Encountered by Researchers in India. Defining the Research Problem: Research Problem, Selecting the Problem, Necessity of Defining the Problem, Technique Involved in Defining a Problem, An Illustration.

Unit II: (12 Lectures)

Reviewing the literature

Place of the literature review in research, Bringing clarity and focus to research problem, Improving research methodology, Broadening knowledge base in research area, Enabling contextual findings, Review of the literature, searching the existing literature, reviewing the selected literature, Developing a theoretical framework, Developing a conceptual framework,

Writing about the literature reviewed. Research Design: Meaning of Research Design, Need for Research Design, Features of a Good Design, Important Concepts Relating to Research Design, Different Research Designs, Basic Principles of Experimental Designs, Important Experimental Designs.

Unit III: (12 Lectures)

Design of Sample Surveys

Design of Sampling: Introduction, Sample Design, Sampling and Non-sampling Errors, Sample Survey versus Census Survey, Types of Sampling Designs. Measurement and Scaling:Qualitative and Quantitative Data, Classifications of Measurement Scales, Goodness of Measurement Scales, Sources of Error in Measurement, Techniques of Developing Measurement Tools, Scaling, Scale Classification Bases, Scaling Technics, Multidimensional Scaling, Deciding the Scale. Data Collection: Introduction, Experimental and Surveys, Collection of Primary Data, Collection of Secondary Data, Selection of Appropriate Method for Data Collection, Case Study Method**.**

Unit IV: (12 Lectures)

Testing of Hypotheses

Hypothesis, Basic Concepts Concerning Testing of Hypotheses, Testing of Hypothesis, Test Statistics and Critical Region, Critical Value and Decision Rule, Procedure for Hypothesis Testing, Hypothesis Testing for Mean, Proportion, Variance, for Difference of Two Mean, for Difference of Two Proportions, for Difference of Two Variances, P-Value approach, Power of Test, Limitations of the Tests of Hypothesis. Chi-square Test: Test of Difference of more than Two Proportions, Test of Independence of Attributes, Test of Goodness of Fit, Cautions in Using Chi Square Tests**.**

Unit V: (12 Lectures)

Interpretation and Report Writing

Meaning of Interpretation, Technique of Interpretation, Precaution in Interpretation, Significance of Report Writing, Different Steps in Writing Report, Layout of the Research Report, Types of Reports, Oral Presentation, Mechanics of Writing a Research Report, Precautions for Writing Research Reports.

Suggested Readings

1. 'Management Research Methodology' by K.N. Krishnaswamy, Appa Iyer Sivakumar & M. Mathirajan, Person Education.
2. 'Research Methodology. G.C. Ramamurthy, Dream Tech Press, New Delhi
3. 'Research Methodology: A Step by Step Guide for Beginners' by Ranjit Kumar,

2nd Edition

4. ‘Research Methodology: An Introduction for Science and Engineering Students’, byStuart Melville and Wayne Goddard
5. ‘Research Methodology: An Introduction’ by Wayne Goddard and Stuart Melville
6. ‘Research Methodology: Methods and Techniques’, by Dr. C.R. Kothari, New AgeInternational Publisher

MGM UNIVERSITY, CHH. SAMBHAJINAGAR

INSTITUTE OF BIOSCIENCES AND TECHNOLOGY

CHOICE BASED CREDIT SYSTEM (CBCS)

SEMESTER PATTERN

Faculty of Sciences

Post Graduate (PG) progrmme

FOOD TECHNOLOGY - CURRICULUM

w. e. f. Academic Year 2023-24

M.Sc. Food Technology

SEMESTER-II

CURRICULUM

First Year - Semester II												
Course Category	**Course Code**	**Course Title**	**Nature of Course**	**No. of Credits**	**Teaching (Contact hrs/ week)**		**Evaluation Scheme (Marks)**			**Minimum Passing (Marks)**		
					L	**P**	**Internal**	**External**	**Total**	**Internal**	**External**	**Total**
MM	**MFT42MML505**	**Beverages Technology**	**L**	3	3	-	60	40	100		16	40
MM	**MFT42MML506**	**Food Commodities**	**L**	3	3	-	60	40	100		16	40
MM	**MFT42MML507**	**Food Microbiology & Toxicology**	**L**	3	3	-	60	40	100		16	40
MM	**MFT42MML508**	**Food Quality System and Food Analysis**	**L**	3	3	-	60	40	100		16	40
ME	**MFT42MEP505**	**1. Lab In Nutraceuticals and health Food**	**P**	2	-	-	30	20	50		8	20
	MFT42MEP506	**2. Lab In Entrepreneurship and Business Management**										
ME	**MFT42MEP507**	**1. Processing Lab**	**P**	2	-	4	30	20	50		8	20
	MFT42MEP508	**2. Food Additives, Adulteration and Toxicology**										
MM	**MFT42MMJ502**	**Micro Project**	**J**	2	-	4	30	20	50		8	20
FP	**MFT42FPJ501**	**Field Project**	**J**	4	-	8	60	40	100		16	40
		Total		**22**	**12**	**16**			**650**			**260**

Note:

Nature of Course : L- Lecture, P-Practical, S-Seminar, J-Project, I-Internship, D-Dissertation,

Course Category: MM-Major Mandatory, ME-Major Elective, MI-Minor, OE-Generic / Open electives, VSC-Vocational skill course, SEC-Skill Enhancement course, AEC-Ability Enhancement course, IKS-Indian Knowledge system, VEC-Value Education course, OJT-On Job Training / Internship / Apprenticeship, FP-Field project, CEP-Community engagement and service, CC-Co – curricular course, RM-Research methodology, RP-Research project

Level 6.0 Award of PG Diploma (44 Credits) after Three Year UG Degree

SYLLABUS STRUCTURE SHEET

BEVERAGES TECHNOLOGY

University: MGM University, CHH. SAMBHAJINAGAR **Faculty:** Basic & Applied Science

Institute: Institute of Biosciences and Tech. **Degree: M.Sc.** Food Technology(PG)

Course Unit Code: MFT42MML505 **Course Unit Title:** Beverages Technology

Credits allocated: 3+0 (3Theory+0 Practical) **Level of Study: PG**

Mode of delivery, planned learning activities and teaching method: Lecture 3 hrs weekly

Recommended Year/Semester: Food Tech. & Processing-Master's of Science, Year1/Semester II

Prerequisites for registration: Registration of a student in various courses in consultation with the respective course teacher and Adviser and acceptance by the Principal. The approved courses must be mentioned in the roster form.

Learning Outcome:

Upon successful completion, students will have the knowledge and skills to: This subject is designed to impart basic knowledge on the area of beverages technologies. Types of beverages, Specialty beverages, Alcoholic beverages.

Objective:

To provide a technical view of beverages and a full discussion of manufacturing processes in the context of technology and its related chemistry as well as a more fundamental appraisal of the underlying science.

COURSE CONTENT

THEORY

Unit-I Beverages and types of beverages (8 Lectures)

Introduction to Beverages, Importance of beverages and status of beverage industry, Classification of beverages, Processing of beverages. FSSAI specifications for beverages. Type of beverages: fruit juices, fermented and non-fermented beverages, synthetic beverages, carbonated and non- carbonated beverages. Low-calorie and dry beverages. Isotonic and sports beverage.

Unit-II Processing of beverages (9 Lectures)

Different process: Juice extraction, clarification, preservation, packaging, concentration and drying. Various beverages from fruit juices, their preparation and preservation: Fruit juice, RTS, Squash,Nectar, cordial, crush, syrup, fruit juice concentrate, fruit juice powder

Unit-III Classification of beverages (10 Lectures)

Non carbonated and carbonated synthetic beverages: Ingredients, source of carbon dioxide, chemical and physical properties of carbon dioxide, carbonating process, packaging of carbonating beverages. Specialty beverages based on tea, coffee, cocoa, spices, nuts, dairy and imitation dairy- based beverages.

Unit -IV Alcoholic beverages (9 Lectures)

Alcoholic Beverages: Non-Distilled Beverages: Beer and Wine Distilled Beverages: Vodka, Rum, Gin, Whisky, Toddy, Brandy, the role of yeast in beer and other alcoholic beverages.

Unit-V Water for beverages (9 Lectures)

Water for beverages: Types of water required for beverages, treatment of water. Additives for beverages: Natural and synthetic sweeteners and colours, acids, emulsifiers, preservatives, flavours and flavour enhancers.

Suggested Reading/ Reference Books/ Text Books:

1. Hardwick WA.1995.Handbook of Brewing.Marcel Dekker.
2. Hui YH.et al2004. Handbook of Food and Beverage Fermentation Technology.Marcel Dek ker.
3. Priest FG &StewartGG.2006.HandbookofBrewing.2ndEd.CRC.
4. RichardPVine.1981.CommercialWineMaking-ProcessingandControls.AVIPubl.
5. VarnamAH&SutherlandJP.1994.Beverages:Technology,
6. Chemistry and Microbiology. Chapman & Hall.
7. WoodroofJG&PhillipsGF.1974.Beverages:CarbonatedandNonCarbonated.AVIPubl.

SYLLABUS STRUCTURE SHEET

FOOD COMMODITIES

University: MGM University, CHH. SAMBHAJINAGAR	**Faculty:** Basic & Applied Science
Institute: Institute of Biosciences and Tech.	**Degree: M.Sc.** Food Technology(PG)
Course Code: MFT42MML506	**Course Title:** Food Commodities
Credits allocated: 3+0 (3 Theory+0 Practical)	**Level of Study: PG**

Mode of delivery, planned learning activities and teaching method: Lecture 3 hrsweekly

Recommended Year/Semester: Food Tech. & Processing-Master's of Science, Year1/Semester II

Prerequisites for registration: Registration of a student in various courses in consultation with the respective course teacher and Adviser and acceptance by the Principal. The approved courses must be mentioned in the roster form

Objective: Learn basics of To study various processing methods for various food materials like fruits & vegetables, dairy products, cereals, meat, poultry, fish and bakery products. To study various innovative food processing techniques.

Learning Outcomes: Upon successful completion the students will be able to:

1. Understand the basics of food processing.
2. Know the various processing technologies involved in fruits andvegetables, dairy, cereals,meat, fish, egg and plantation products.
3. Learn the basics on microbiology of food products.
4. Describe the process of manufacture of various food products.
5. Recognize various methods of preservation of food.

COURSE CONTENT

THEORY

Total Lectures = 45

UNIT I:Cereal, Pulses and Oil Seeds Technology (9 Lectures)

Rice milling, Pulse milling, Wheat milling - Oil extraction - Methods of manufacture ofBread - different processes of manufacture - types of breads - buns, biscuits, cakes andcookies-Pasta products-Tortilla-Method of manufacture.

UNIT II :Fruits and Vegetable Processing (8 Lectures)

Production of Fruits and vegetables in India, Cause for heavy losses, preservation treatments - Basics of Canning, Minimal processing and Hurdle technology as appliedto Vegetable and Fruit processing, Processing of fruit juices, Dehydration, Aseptic processing.

UNIT III: Dairy Processing (10 Lectures)

Basic dairy terminology, composition, General tests at reception, Dairy Processing - Method of manufacture of Standardized, toned and double toned milk, milk powder - Equipments-Pasteurizers, homogenizers and pumps-Method of manufacture of dairy products-Ice-cream, Cheese, Paneer, Yoghurt-Pasteurization and microorganismsinvolved in spoilage of milk.

UNIT IV: Meat, Poultry and Fish Processing (8 Lectures)

Meat composition from different sources, Definitions and measurements, Carcass Processing, Meat Products, Processing of Poultry Products, Fish and other Marine Products Processing .

UNIT V:Plantation Product Technology (10 lectures)

Processing of Tea, Coffee and Cocoa - Outline of the methods of manufacture of -greentea, black tea, instant tea, Instant coffee, Cocoa and Chocolate. Outline of the methods of processing of Pepper, cardamom, ginger, vanilla and turmeric.

Reference books/Text Books

1. Srivastava, R. P. and Kumar,S.:Fruit and Vegetable Preservation:Principles and Practices.International Book Distributing Co.Lucknow (2ndEdition 1998).
2. Chakraverty, A., Mujumdar A. S., Raghavan G. S. Vand Ramaswamy H. S. Hand book of Post-harvest Technology: Marcel Dekker Press, USA(2001)
3. James Harper W. And Carl W. Hall: Dairy Technology and Engineering AVI Publishing, Westport, USA(1976)
4. Karel Kulpand Joseph P Pante: Hand Book Of Cereal Science and Technology Mercel Dekkar USA (2000)
5. Samuel Matz: The Chemistry and Technology of Cereals as Food and Feed,Chapman & Hall (1992)

SYLLABUS STRUCTURE SHEET

FOOD MICROBIOLOGY & TOXICOLOGY

University: MGM University, CHH. SAMBHAJINAGAR

Faculty: Basic & Applied Science

Institute: Institute of Biosciences and Tech.

Degree: M.Sc. Food Technology(PG)

Course Unit Code: MFTMML507

Course Unit Title: Food Microbiology & Toxicology

Credits allocated: 3+0 (3 Theory+0 Practical)

Level of Study: PG

Mode of delivery, planned learning activities and teaching method: Lecture 3 hrs weekly

Recommended Year/Semester: Food Tech. & Processing-Master's of Science, Year1/Semester II

Prerequisites for registration: Registration of a student in various courses in consultation with the respective course teacher and Adviser and acceptance by the Principal. The approved courses must be mentioned inthe roster form

Learning Outcome:

Upon successful completion, students will have the knowledge and skills to: A thorough explaining of the -Growth and survival of microorganisms in foods, Biochemical changes caused by microorganisms, Food hygiene and sanitation, Food Fermentations. This subject is designed to impart a fundamental knowledge on the principles and food microbiology techniques.

Objectives:

To acquaint with different groups of micro-organisms associated with food, their activities, destruction and detection in food.

COURSE CONTENT

THEORY

UNIT-I Growth and survival of microorganisms in foods (8 Lectures)

Growth and survival of microorganisms in foods; spoilage organisms of milk, fruits, vegetables,grains and oil seeds, meat and poultry; Physical and chemical methods to controlmicroorganisms.

UNIT-II Microbial spoilage of foods Factors affecting kinds (9 Lectures)

Microbial spoilage of foods Factors affecting kinds, numbers, growth and survival of microorganisms in foods, Intrinsic factors; pH, water activity, nutrients etc and Extrinsicfactors: Relative humidity, temperature and gaseous atmosphere.

UNIT-III Role of microorganisms in food (10 Lectures)

Role of micro organisms in food : all factors affecting growth and destruction of microbes-aerobes and anaerobes, psychrophiles, psychrotrophs, mesophiles, thermoduric, thermophiles, halophiles, osmophiles and sporeformers.

UNIT-IV Definition scope and general principles of food toxicology (9 Lectures)

Definition scope and general principles of food toxicology; food contamination (physical, chemical and microbial) classification of food toxicants; factors affecting toxicity ofcompounds.

UNIT-V Toxicants and allergens in foods derived from plants, animals (9 Lectures)

Toxicants and allergens in foods derived from plants, animals; Microbial toxins; Food Poisoning; Food borne infections and disease; Derived Food toxicants- Processing & Packaging.

Suggested Reading/ Reference Books/ Text Books

1. Abdulla, M., Vohora, S.Band Athar, M. 1995. Trace and toxic elements in nutrition andhealth. Jamia Hamdard New Delhiand WileyEastern Ltd.
2. JohnN.Hathcock.1989.NutritionalToxicology.AcademicPress,Inc.Vol.III.
3. Klara Miller. 1987. Toxicological Aspects of Food. Elsevier AppliedPublishersLTD.
4. MichaelJ.PelczarJR,E.C.S.Chan,NoelR.Krieg.2021.Microbiology.KindleEdition.

SYLLABUS STRUCTURE SHEET

FOOD QUALITY SYSTEM AND FOOD ANALYSIS

University: MGM University, CHH. SAMBHAJINAGAR

Faculty: Basic & Applied Science

Institute: Institute of Biosciences and Tech.

Degree: M.Sc. Food Technology(PG)

Course Unit Code: MFTMML508

Course Unit Title: Food Quality System and Food Analysis

Credits allocated: 3+0

Level of Study: PG

Mode of delivery, planned learning activities and teaching method: Lecture 3 hrs weekly

Recommended Year /Semester: Food Tech. & Processing -Master's of Science,Year1/SemesterII

Prerequisites for registration: Registration of a student in various courses in consultation with the respective course teacher and Adviser and acceptance by the Principal. The approved courses must be mentioned in the roster form

Learning Outcome:

Upon successful completion, students will have the knowledge and skills to: Concept of quality, quality management, Quality assurance, Concept of quality, Concepts of quality management, Quality assurance and Management.

Objectives

To acquaint with food quality parameters and control systems, food standards, regulations, specifications.

COURSE CONTENT

THEORY

(45 Lectures)

UNIT-I Food quality and its role in food industry (9 Lectures)

Food quality and its role in food industry; need of quality control, factors affecting quality control, Quality attributes: physical, chemical, nutritional, microbial, and sensory; their measurement and evaluation, dominant and hidden attributes Color, Viscosity, Consistency, Sizeand shape, Texture, Taste. Defectin the food.

UNIT-II Concepts of quality management (8 Lectures)

Concepts of quality management: Objectives, importance and functions of quality control; Quality management systems in India; Sampling procedures and plans

UNIT-III Food Safety and Standards Act (10 Lectures)

Food Safety and Standards Act,2006. International food standards, Total Quality Management; GMP, GAP; Sanitary and hygienic practices; HACCP; Indian & International quality systems and standards like ISO and Food Codex; Applications in different food industries; Food adulteration and food safety.

UNIT-IV Sampling techniques (9 Lectures)

Sampling techniques; Wateractivity, its measurements and significance in food quality; Calibration and standardization of different instruments.

UNIT-V Different analytical techniques used in food analysis (9 Lectures)

Different analytical techniques used in food analysis. Different separation technique used for food. Microscopic techniques in food analysis.

Suggested Reading/ Reference Books/ Text Books :

1. Amerine MA, Pangborn RM & Rosslos EB.1965.Principles of Sensory Evaluation of Food. A c ademic Press.
2. Early R.1995.Guide to Quality Management Systems for Food Industries. Black ie Academic.
3. Furia TE. 1980. Regulatory status of Direct Food Additives.CRC Press.
4. Jellinek G.1985.Sensory Evaluation of Food-Theory and Practice.Ellis Horwoood.

SYLLABUS STRUCTURE SHEET
LAB IN NUTRACEUTICALS AND HEALTH FOOD

University: MGM University, CHH. SAMBHAJINAGAR	**Faculty:** Basic & Applied Science
Institute: Institute of Biosciences and Tech.	**Degree: M.Sc.** Food Technology(PG)
Course Unit Code: MFT42MEP505	**Course Unit Title:** Lab In Nutraceuticals and health Food
Credits allocated: 0+2	**Level of Study: PG**

Mode of delivery, planned learning activities and teaching method: Practical 4 hrs / weekly

Pre-Requisites: The student should have knowledge of food chemistry

Objectives

1. To acquaint students with extraction procedures of nutrients and functionalcomponents from foods
2. To develop food labelling knowledge and competency in students

Learning Outcomes

1. The student will be able to estimate the nutrient content of fruitsand vegetables
2. The student will be able to grade foods in terms of its nutritional Quality

COURSE CONTENT

PRACTICALS

1. Study of Standard operating procedure in laboratory.
2. Development of multigrain digestive cookies.
3. Market Survey and Classification of Health Foods and Nutraceuticals
4. Extraction and Estimation of Vitamin C from Fruits.
5. Preparation of multigrain porridge.
6. Extraction and Estimation of Folic Acid from Vegetables
7. Extraction and Estimation of β-carotene from Carrots.
8. Extraction and Estimation of Lycopene from Tomatoes
9. Extraction of antioxidants from fruits.
10. Development of Labels for Health Foods
11. Extraction of essential oil from rosemary.
12. Preparation of herbal instant tea-bags.
13. Development of low glycemic index breakfast snack

14. Development of millet based instant idli mix.
15. Development of fibre rich Instant soup formulations.
16. Preparation of Alfalfa powder extract.
17. Preparation of multi nutrients vegetable based seasoning cubes.
18. Preparation of nutritious spice mix seasonings.
19. Preparation of (sucrose) sugar free energy bars.
20. Preparation of gluten free extruded products
21. Preparation of non-dairy milk from oilseeds.
22. Preparation of barley water.
23. Preparation of tapioca based snacks.
24. Preparation and extraction of detox water.
25. Preparation of spice decoctions.
26. Development of non-dairy prebiotic food.
27. Development of non-dairy probiotic food.
28. Preparation of dietary supplements from citrus fruits.
29. Preparation of omega-3 & omega-6 rich dietary supplements.
30. Preparation of hormone balancing food formulations.

SYLLABUS STRUCTURE SHEET

LAB IN ENTREPRENEURSHIP AND BUSINESS MANAGEMENT

University: MGM University, CHH. SAMBHAJINAGAR	**Faculty:** Basic & Applied Science
Institute: Institute of Biosciences and Tech.	**Degree: M.Sc.** Food Technology(PG)
Course Unit Code: MFT42MEP506	**Course Unit Title:** Lab In Entrepreneurship and Business Management
Credits allocated: 0+2	**Level of Study: PG**

Mode of delivery, planned learning activities and teaching method: Practical 4 hrs / weekly

Pre-Requisites: The student should have basic understanding of business and marketing

Objectives

1. To familiarize students with the practical development of a business model
2. To make students competent in marketing a business idea

Learning Outcomes

1. The student will gain ability to design a business model
2. The student will gain the ability to advertise and market their business

COURSE CONTENT

PRACTICALS

1. Conceptualizing a Business Idea
2. Designing a Business Model
3. Creating Advertisements for the Proposed Business
4. Marketing the proposed Business
5. Data collection from market on various projects on food processing and analysis
6. Project proposals as entrepreneur – individual and group
7. Calculation of project cost and break even analysis of specific project
8. Different schemes for food entrepreneurs
9. Visit to public enterprise
10. Visit to private enterprise
11. Visit to agro-processing/food business centres
12. SWOT analysis of public enterprises

13. SWOT analysis of private enterprise
14. Presentation of project proposals in the class
15. Licensing and registration process
16. Examination of Cereals as per specifications
17. Examination of milk and milk products as per specifications
18. Examination of Oil and Oil products as per specifications
19. Examination of fruits and vegetable products as per regulations
20. Studies on Market Survey based on enterprise
21. Preparation of Project Report
22. Project selection, identification, appraisal and scope
23. Methods of monitoring and feasibility of projects
24. Studies on investment and repayment plants
25. Project monitoring and Control – PERT Modeling
26. Studies on different types of Market
27. Study about Environment (Protection) Act, 1986
28. Study on Women entrepreneurship
29. Study of tools and techniques of concept development
30. Study of tools and techniques applied in product design

SYLLABUS STRUCTURE SHEET

PROCESSING LAB

University: MGM University, CHH. SAMBHAJINAGAR	**Faculty:** Basic & Applied Science
Institute: Institute of Biosciences and Tech.	**Degree: M.Sc.** Food Technology(PG)
Course Unit Code: MFT42MEP507	**Course Unit Title:** Processing Lab
Credits allocated: 0+2	**Level of Study: PG**

Mode of delivery, planned learning activities and teaching method: Practical 4 hrs / weekly

Recommended Year /Semester: Food Tech. & Processing -Master's of Science,Year1/SemesterII

Prerequisites for registration: Registration of a student in various courses in consultation with the respective course teacher and Adviser and acceptance by the principal. The approved courses must be mentioned in the roster form. Candidates should pass in undergraduate Life Science.

COURSE CONTENT

PRACTICAL

1. Chemical and microbiological analysis of raw water quality.
2. Preparation of regional fruit juices.
3. Preparation of whey-based beverages.
4. preparation of iced and flavoured tea beverage.
5. Preparation of carbonated and non- carbonated soft drinks.
6. Preparation of wine and beer.
7. Preparation of soy milk.
8. fruitmilkshakes, herbal beverages.
9. visit to relevant processing units.
10. Microscopic examination of bacteria, and yeast and molds.
11. Standard plate count; Yeast and mould count, Spore count.
12. Detection and enumeration of pathogenic and indicator organisms in food.
13. MPN of coli forms.
14. Enumeration of physiological groups- psychrophile, thermodurics, osmophiles and halophiles.
15. Evaluation of microbiological quality of commonly consumed street foods.

16. Preparation of fermented product
17. Preservation of vegetables with minimal processing
18. Preservation of fruits with minimal processing
19. Preservation of Pineapple Jam
20. Preservation By Diying
21. Preparation of Pineapple Syrup
22. Preparation of RTS
23. Preparation of Mango Bar
24. Preparation of Nutmeg Pickle
25. Preparation of Sauce
26. Preparation of Grape Wine
27. Tamarind Pulp,
28. Puree, Concentrate
29. Visit MNc food industry
30. Fruit Bar / Toffee

SYLLABUS STRUCTURE SHEET

Food Additives, Adulteration And Toxicology

University: MGM University, CHH. SAMBHAJINAGAR	**Faculty:** Basic & Applied Science
Institute: Institute of Biosciences and Tech.	**Degree: M.Sc.** Food Technology(PG)
Course Unit Code: MFTMEP508	**Course Unit Title:** Food Additives, Adulteration and Toxicology
Credits allocated: 0+2	**Level of Study: PG**

Mode of delivery, planned learning activities and teaching method: Practical 4 hrs / weekly

Pre-Requisites: The student should have knowledge of types of foods, chemistry, and microbiology

Objectives

1. To familiarize students with isolation of various biopolymers from food resources
2. To acquaint students with the practical aspects of toxin-free foods

Learning Outcomes

1. The student will be able to practically analyse the presence of additives in foods
2. The student will be able to practically determine the presence of adulterants in foods

COURSE CONTENT

PRACTICALS

1. Estimation of Preservatives in Foods
2. Estimation of Colours in Foods
3. Isolation of Native and Modified Proteins, Starches and Lipids in Foods
4. Protocol for Detection and Quantification of Toxins in Food
5. Olfactory Analysis of Food Products
6. Demonstration for the Detection of Pesticide Residues in Food
7. Demonstration for the Detection of Antibiotic Residues/ Hormones/Veterinary Drugs, and Heavy Metals in Foods
8. Analysis of Microbial and Plant Toxins
9. Detection of Cellulose in Milk
10. Detection of Ammonium Salts in Milk
11. Detection of Vanaspati/Hydrogenated Edible Fat In Ghee
12. Detection of Rancidity of oil
13. Detection of Adulteration in coconut oil

14. Detection of mobile oil (Lube) in edible oil
15. Detection of Brick Powder in Chilli Powder
16. Detection of Papaya Seeds in Black Pepper
17. Detection of Common Salt in Coriander Powder
18. Detection of Iron Filing in Tea Leaves/Wheat Flour
19. Detection of Mineral Acid in Vinegar/Carbonated Beverages
20. Detection of Chalk in Asafoetida
21. Detection of Dried Tendrils of Maize Cob in Saffron
22. Detection of Lead Chromate in Pulses/Other Foods
23. Determination of Boric Acid in Maida/Rice Flour
24. Coal Tar Dyes In Ghee, Butter, Khoa, Cheese, Condensed Milk, Milk Powder
25. Coal Tar Dyes (Azo) Dyes in Milk
26. Preparation of a Homogenous Laboratory Sample for Analysis of Aflatoxin
27. Preparation of Aflatoxin Standards for Thin Layer Chromatography Method
28. Determination of Aflatoxin in Corn and Peanut Powder/Butter Liquid Chromatographic Method
29. TLC Method for Determination of Aflatoxins in Food and Feeds: Romer Mini Column Method
30. Thin Layer Chromatographic Method for Determination Aflatoxins in Corn and Peanuts (Groundnuts)

SYLLABUS STRUCTURE SHEET
MICRO PROJECT

University: MGM University, CHH. SAMBHAJINAGAR
Faculty: Basic & Applied Science
Institute: Institute of Biosciences and Tech.
Degree: M.Sc. Food Technology(PG)
Course Unit Code: MFT42MMJ502
Course Unit Title: Mini Project
Credits allocated: 0+2
Level of Study: PG

Mode of delivery, planned learning activities and teaching method: Practical 4 hrs / weekly

Recommended Year /Semester: Food Tech. & Processing -Master's of Science,Year1/SemesterII

Prerequisites for registration: Registration of a student in various courses in consultation with the respective course teacher and Adviser and acceptance by the principal. The approved coursesmust be mentioned in the roster form. Candidates should pass in undergraduate Life Science.

Course Outcomes:

1. Students will be able to practice acquired knowledge within the chosen area of technologyforproject development.
2. Identify, discuss and justify the technical aspects of the chosen project with a comprehensiveandsystematic approach.

PROCEDURE

Sr. No	Activities	Responsibilities
1	PG students are decide on thire team members for their semester project with their proposed project domain and title	Project head, PG students
2	Director shall allocate the project guide based on their area of expertise (ot more than 3 batches to a guide)	Director
3	Ensuring that students have regular discussion meetings with their project guides.	Project guide Project head
4	Synopsis preparation and submission	Project head
5	Verification of student project log book	Project guide Project head

6	Approval of PPT : Abstract,existing, proposed system.30% of proposed work. 80% of proposed work. 100% of proposed work.	Project guide
7	Preparation and submission of progress report duringproject	Students Project head
8	Preparaing list for Redo students (insufficient content,plagiarism, poor presentation, genuiene absentees.	Project head
9	Submission of hard copy of project report	Project head
10	Evaluation of project report	External examiner
11	Organizing final project viva-voce	Project heads
12	Ensuring that if a candidate fails to submit the project reporton or before the specified deadline , he/she is deemed to have failed in the project work and shall re –enroll for the same	Project head Project guide Director

SYLLABUS STRUCTURE SHEET

FIELD PROJECT

University: MGM University, CHH. SAMBHAJINAGAR	**Faculty:** Basic & Applied Science
Institute: Institute of Biosciences and Tech.	**Degree: M.Sc.** Food Technology(PG)
Course Unit Code: MFTFPJ501	**Course Unit Title:** Field Project
Credits allocated: 0+4 (Practical)	**Level of Study: PG**

Mode of delivery, planned learning activities and teaching method: Practical 4 hrs / weekly

Recommended Year /Semester: Food Tech. & Processing -Master's of Science,Year1/Semester III

Prerequisites for registration: Registration of a student in various courses in consultation with the respective course teacher and Adviser and acceptance by the principal. The approved courses must be mentioned in the roster form. Candidates should pass in undergraduate Life Science.

Course Outcomes:

Students will be able to practice acquired knowledge within the chosen area of technologyforproject development.

Identify, discuss and justify the technical aspects of the chosen projectwith a comprehensive and systematic approach.