Syllabus

For

M.Tech. (Food Technology)

(Effective from the Session: 2016-17)
## Course Structure and Evaluation Scheme for M. Tech. Food Technology Course
**(Effective from Session 2016-17)**

### SEMESTER I

<table>
<thead>
<tr>
<th>S. N.</th>
<th>Subject Code</th>
<th>Name of Subject</th>
<th>Periods</th>
<th>Credit</th>
<th>Evaluation Scheme</th>
<th>Subject Total</th>
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### SEMESTER IV

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Departmental Elective I
1. MTFE-011: Chemical Engineering Principles
2. MTFE-012: Advanced Separation Processes
3. MTFE-013: Process, Modeling and Simulation

Departmental Elective II
1. MTFE-021: Biological Sciences
2. MTFE-022: Engineering Mathematics
3. MTFE-023: Therapeutic Foods

Departmental Elective III
2. MTFE-032: Food Fermentation Technology
3. MTFE-033: Technology of Meat and Meat Products

Departmental Elective IV
1. MTFE-041: Milk and Milk Products Technology
2. MTFE-042: Novel Food Packaging Technology
3. MTFE-043: Food Processing Effluent Treatment Technology

Departmental Elective V
1. MTFE-051: Technology of Fabricated and Textured Foods
2. MTFE-052: Advances in Food Processing Technology
3. MTFE-053: Food Quality Management
MTFT-101: FOOD BEVERAGES 3:0:0


Text books:
4. Food Product Development: Arlington

MTFT-102: MICROBIOLOGY AND CHEMISTRY OF FOODS 3:0:0


Text Books:
3. General Biochemistry: J.H.Weil
5. Food Facts & Principles: Shakuntala Manay

MTFE-101: CHEMICAL ENGINEERING PRINCIPLES 3:0:0

Introduction of unit operations and unit processes, material and energy balance in various unit operations such as Mixing, Vaporization and Condensation, Distillation, Crystallization etc., Material Balance in processes involving chemical reaction, Thermo Chemistry. Fluid flow operations, Pumping, Metering of fluids, Filtration, Screening and size reduction. Heat and Mass transfer Operations, Heat transfer by conduction, convection and radiation, Heat exchange equipments, Fundamentals of diffusion, absorption, distillation, extraction and their equipment. Thermodynamics and Kinetics of reactions, First and second law of thermodynamics, types of reactions such as first order and second order, types of reactors such as batch, plug-flow and CSTR.

Text Books:
MTFE-012: ADVANCED SEPARATION PROCESSES


Text Books:
2. Unit Operations in Chemical Engineering: McCabe Smith, TMH.

MTFE-013: PROCESS MODELLING AND SIMULATION


Text Books:

MTFE-021: BIOLOGICAL SCIENCES


Text Books:
1. Microbiology: M.J.Pelczar, Reid & Chann, Tata Mc Graw Publications
3. Biochemistry : Lubert Stryen
MTFE-022: ENGINEERING MATHEMATICS 3:0:0


Text Books:

MTFE-023: THERAPEUTIC FOODS 3:0:0


Text Books:
1. Human Nutrition : Benjamin T. Burton
2. Dietetics : B. Srilakshmi
3. Nutrition and Dietetics: Shubhangini A. Joshi
4. Nutritive value of Indian Foods : C. Gopalan :

MTFL-151: FOOD MICROBIOLOGY LAB 0:0:3

1. Familiarization with common techniques for handling pure culture serial dilution, Inoculation, slide preparation incubation, counting etc.
2. Micrometry and determination of size of different microbes.
3. Simple and differential staining of microorganisms and their examination.
4. Preparation and sterilization of media and glass ware for microbial counts.
5. Determination of Standard Plate Count (SPC) in natural and/or processed foods.
6. Microbiological examination of some selected natural and processed foods.
7. Microbiological examination of potable water: Total and coliform count.
8. Direct total, viable, and non-viable count of microorganisms in some selected processed foods.

Text Books:
Microbiology: M.J.Pelczar, Reid & Chann, Tata Mc Graw Publications
1. Determination of moisture content of foods by oven drying.
2. Determination of Total and Acid insoluble ash content in foods.
3. Determination of Crude fat content by solvent extraction methods in foods.
4. Determination of crude Protein by Kjeldhal method.
5. Determination of reducing and total sugar content in foods.
6. Analysis of water for potable and food purposes
7. Determination of free fatty acid content in fats and oils.
8. Study of some functional properties of proteins.

Text Books:
1. BIS and AOAC Methods of Food analysis.

MTFT-201: PRESERVATION & PROCESSING OF FOODS


Text Books:
1. Principles of Food Preservation Part-II: O.R.Fenema

MTFT-202: CEREALS & SNACK FOODS


Text Books:
1. C.F.T.R.I. Mysore Manuals on Rice and its Processing
**MTFE-031: FRUITS, VEGETABLES, PLANTATION & SPICE PRODUCTS**


**Text Books:**

2. An introduction to the Post-harvest physiology & handling of fruits and vegetables: R.H.H. Wills

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**MTFE-032: FOOD FERMENTATION TECHNOLOGY**


**Text Books :**

1. K.H. Steinkrus Handbook of Indigenous Fermented Foods
2. Prescott & Dunn Industrial Microbiology
3. L.E. Casida Industrial Microbiology

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**MTFE-033: TECHNOLOGY OF MEAT AND MEAT PRODUCTS**

Composition and nutritional value of meat, Meat microbiology and safety. Scientific slaughtering; Post mortem changes in meat; Conversion of muscle to meat; Meat plant hygiene – GMP and HACCP. By-products from meat industries and their utilization. Meat processing- curing and smoking; Fermented meat products (sausages and sauces); Frozen meat & meat storage. Beef Mutton, Pork Sausages and other meat products. Poultry processing, Canning of poultry products. Structure, composition, Nutritional and Functional characteristics of Egg. Manufacturing of egg white, Egg yolk and Whole Egg solids/powder. Classification of fresh water fish and marine fish; Commercial handling, storage and transport of raw fish. Methods of processing and preservation of fish- Canning, Freezing, Drying, Smoking and Curing. Fish products – fish meal, fish protein concentrate etc.

**Text Books :**

1. G.J.Mountney Poultry Products Technology
3. Fish & Fisheries of India; Jhingram VG; 1983, Hindustan Pub Corp
MTFE-041: MILK AND MILK PRODUCTS TECHNOLOGY 3:0:0


Text Books:
1. Technology of Indian Milk Products: R.P.Aneja, Mathur & Bannerji, Dairy India Publication
3. Outlines of Dairy Technology: Sukumar De

MTFE-042: NOVEL FOOD PACKAGING TECHNOLOGY 3:0:0


Text Books:

MTFE-043: FOOD PROCESSING EFFLUENT TREATMENT TECHNOLOGY 3:0:0


Text Books:
1. J.H. Green Food Processing Waste Management ; Environment (Protection) Act 1986
2. AFST(I) & CFTRI Proceedings of the Symposium on By-products From food Industries: Utilization and Disposal

Text Books:

2. AFST(I) & CFTRI Proceedings of IFCON
3. Periodicals by AFST(I), CFTRI Indian Food Industry


Text Books:

1. Detection / Estimation of some additives in foods
2. Detection/Estimation of adulterants in some foods
3. Extension of shelf life/ preservation of foods by use of low temperature.
4. Processing and preservation of foods by use of high temperature.
5. Preservation and processing of certain vegetables by drying and dehydration
6. Preservation of foods by Sugar/ chemical preservatives.
7. Sensitivity tests (Threshold/Dilution) to measure individual ability for sensory analysis. Difference tests to evaluate qualitative and' quantitative differences and/or preference between test products.
8. Assessment of quality of wheat flour (Water Absorption Power, Gluten Content, and Sedimentation Value etc.).

The student(s) will be required to prepare and deliver a Seminar, on the assigned topic with the help of Power Point Presentation as well as submit a type written report.

The student(s) will be required to prepare and deliver a detailed Seminar, on the assigned Topic (s) with the help of Power Point Presentation as well as submit a type written report. The seminar shall also include a detailed question answer session.

The student(s) will be required to search literature pertaining to the Project/Dissertation undertaken related to design of an equipment/ processing of a food commodity / optimization of a process/ new product development etc, comprehend it and prepare a report for assessment and viva-voce.

The student(s) will be required to perform the experimental work in the lab pertaining to the Project/ Dissertation undertaken as in MTFL-352, under the guidance of the Supervisor. The candidate is required to present his/her work from time to time before the departmental Post Graduate Committee for internal assessment. After completion of work the students are required to comprehend it and prepare a detailed Project report for external assessment. The candidate will also be required to prepare and deliver a detailed presentation pertaining to the work done during the project/ dissertation.