

*Placed at the meeting of
Academic Council
held on 12.12.2019*

APPENDIX - E
MADURAI KAMARAJ UNIVERSITY
(University with Potential for Excellence)
Syllabus for New Course
Diploma in Food Processing
(One year) Semester Pattern
Under UGC sponsored Community College Courses
(With effect from the academic year 2018-2019 onwards)
Regulations and Scheme of Examinations

Objectives

Food Technology is one of the known vast domains. It deals with the production process to make food. Food processing is done to achieve certain goals like the ones stated below:

- To boost the shelf life of food articles.
- To prevent contamination of food.
- To learn transport and storage of food.
- To turn food products into the ones that appeal to customers.

There are certain criteria that have to be compiled for the apt processing of food, right from the possibility of a pest or a bacteria to invade and multiply on foods to the biological activity of foods.

Eligibility of the Course:

Admission to the Diploma in Food Processing course will be opened to the candidates who passed 10, +2 examination with conventional schooling without any background of vocational training. Equal weightage should be given to vocational subjects at +2 level while considering the students for admission into CC for recognition of skills credits.

Duration of the Course:

The Duration of the Diploma in Food Processing course is one year consisting of two semesters each semester spanning for 6 months of minimum 90 working days. Period of course from June to November and December to April.

Teaching facilities:

1. One Co-ordinator, Two Assistant Professors.
2. Inter and intra faculty, contributory staff, professors, Industrial personnel etc with qualification of teacher for Diploma in Food Processing.

Course Structure

- All theory papers will have 6 periods per week, including 1 period for assignments, discussion, presentations, etc.
- There shall be 6 practical classes per week for Food Processing.
- In addition, there shall be one qualifying paper in self-learning mode called Field work/Mini project/Project work.
- Each Theory and Practical Paper shall be of 100 marks.
- Each semester will have theory examination of two papers 100 marks each with 75 marks for university examination and 25 marks for internal.
- Each semester will have two practical examinations (60 marks for External + 40 marks for experimental work).
- Each semester will have one Field work/Mini project/Project work with viva-voce (25 marks internal + 75 marks External).
- Total Number of Papers : 10.

Scheme of Examinations - Diploma in Food Processing - Semester-I

Sem-1	Paper Name	Credit	Hours per week	Internal	External	Total	External	
							Duration	Total
Paper 1	Basics of Food Processing	6	6	25	75	100	3	75
Paper 2	Basics of Food Processing (Practical)	6	6	40	60	100	3	60
Paper 3	Technology of Spices and Plantation Products	6	6	25	75	100	3	75
Paper 4	Technology of Spices and Plantation Products (Practical)	6	6	40	60	100	3	60
Paper 5	Skill Development in Food Preparation – I (Practical)	6	6	25	75	100	3	75

Semester - II

Sem-II	Paper Name	Credit	Hours per week	Internal	External	Total	External	
							Duration	Total
Paper 1	Fruits and Vegetables Processing	6	6	25	75	100	3	75
Paper 2	Fruits and Vegetables Processing (Practical)	6	6	40	60	100	3	60
Paper 3	Food Quality Control and Management	6	6	25	75	100	3	75
Paper 4	Food Quality Control and Management (Practical)	6	6	40	60	100	3	60
Paper 5	Skill Development in Food Preparation - II	6	6	25	75	100	3	75

Scheme for semester exam

Internal – 25 marks
 External – 75 marks

Total - 100 marks

Scheme for Internal assessment (Theory)

Test – 15 marks (average of the best of two)
 Assignment - 5 marks
 Quiz - 5 marks :

Total - 25 marks

Scheme for Internal assessment and External (Practical)

S.No	Components	Internal	External
1	Attendance	10	-
2	Record note	10	15
3	Lab work	20	25
4	Presentation	-	10
	Total	40	60

Scheme for Internal & External assessment (Project)

S.No	Components	Internal marks	External marks
1	Attendance	5	-
2	Report	15	20
3	Mock-viva	5	-
4	Presentation	-	40
	Total	25	75

Question Paper Pattern

Marks : 75

Duration : 3 hrs.

Section-A :	Answer all the questions (one question from each unit)	5 x 2 = 10 marks
Section-B :	Either or type (one question from each unit) -	5 x 7 = 35 marks
Section-C :	Answer any three out of five questions (one question from each unit)	3 x 10 = 30 marks

Model Question Paper –Basics of Food Processing

Maximum marks : 75

Duration : 3 hours

Section-A (5x2=10 Marks) – Answer all the questions.

1. Define food Science
2. Define food processing
3. Define steaming
4. Write notes on drying.
5. Define cereals .

Section-B (5 x 7 = 35 Marks) Answer all the questions

6. Explain the basic food groups (or) Write notes on cooking methods.
7. Explain about the scope of food processing (or) Explain in detail about the objectives of Food processing.
8. Write notes on (a) Frying, (b) Grilling (or) Explain about pickling.
9. Discuss about concentration methods. (or) Explain about thermal processing.
10. Explain in detail about millets and pulses (or) Describe about vegetables and fruits.

Section-C (3 x 10 = 30 Marks) – Answer any three out of five questions.

11. Explain in details about the food pyramid and balanced diet.
12. Discuss in detail about the advantages and dis-advantages of food processing.
13. Write notes on (a) Microwave cooking, (b) Fermentation.
14. Discuss about Class-I and Class-II preservatives.
15. Explain the sources and health benefits of (a) Meat, (b) Fish, (c) Egg.

Semester -I

1. Basics of Food Processing

No. of credits: 6

No. of instructional hours: 6 per week

Unit-I : Introduction to food science

Food science definition, scope of studying food science: Basic five food groups, food pyramid and balanced diet, Cooking definition and objectives, Cooking methods.

Unit – II : Introduction to Food Processing

Definition, Objectives, Scope of food processing industry, Advantages and disadvantages.

Unit-III : Types of food processing and its applications

Introduction to different processes employed in food processing (Milling, Boiling, Par Boiling, Steaming, Braising, Stewing, Roasting, Frying, Grilling, Baking, Microwave cooking, Fermentation, Pickling, Refining).

Unit-IV: Food Preservation

Thermal Processing, drying, Concentration Methods, Class I and Class II Preservatives.

Unit-V : Types of foods

Processing of Cereals, Millets, pulses, nuts, oil seeds, vegetables, fruits, meat, fish and egg.

Text book

1. Srilakshmi, B, Food Science, New Age International Private Limited Publishers, New Delhi, Chennai (1997).
2. Mudambi, R.S. and Rajagopal, M.Y. Fundamentals of Food and nutrition, Wiley Eastern Limited:New Delhi (1991).

2.Basics of Food Processing (Practical)

No. of credits: 6

No. of Instructional Hours: 6 per week

1. Weights and measures of raw and cooked foods.
2. Preparation of nuts based dishes.
3. Preparation of product by green leafy vegetables.
4. Preparation of product by roots and tuber
5. Preparation of product by fruits.
6. Demonstration of various perishable food items and degree of spoilage
7. Preservation of food by high concentration of sugar
8. Preservation of food by using salt

3. Technology of Spices and Plantation Products

No. of credits: 6

No. of Instructional Hours: 6 per week

Unit-I : Coffee: Occurrence, chemical constituents; harvesting, fermentation of coffee beans; drying; roasting; instant coffee technology; Tea: Occurrence, chemistry of constituents; harvesting; types of tea – green, oolong and CTC; manufacturing process for green tea and black tea manufacture; instant tea manufacture; quality evaluation and grading of tea.

UNIT -II : Cocoa: Occurrence, chemistry of the cocoa bean; changes taking place during fermentation of cocoa bean; processing of cocoa bean; cocoa powder; cocoa liquor manufacture; chocolates–types, chemistry and technology of chocolate manufacture;

Unit-III : Major spices: Pepper, cardamom, ginger, chili and turmeric–flavour identicals; quality control; fumigation and irradiation of spices.

Unit-IV : Cardamom Processing-Introduction-, Types of cardamom, cardamom production, harvesting, cleaning, package, storage and standards.

Unit-V : Pre treatment methods of cardamom, drying, sun drying, solar drying, Wood-fired dryer, Electric or gas dryer, Humidity---controlled drying, Grading.

Text Books:

1. Banerjee B. 2002. Tea Production and Processing. Oxford Univ. Press.
2. Minifie BW. 1999. Chocolate, Cocoa and Confectionery Technology. 3rd Ed. Aspen Publ.
3. NIIR. 2004. Handbook on Spices. National Institute of Industrial Research Board, Asia Pacific Business Press Inc.

4. Technology of Spices and Plantation Products (Practical)

No. of credits: 6

No. of Instructional Hours: 6 per week

1. Estimation of extractives, caffeine in tea and coffee; the aflavin and the arubigens of tea and total solids
2. Estimation of Moisture and volatile oil content of spices
3. Estimation of Aromatic compounds in spices
4. Curcumin content of turmeric
5. Storage and packaging of spices
6. Detection of microbial quality and adulteration in spices
7. Visit to Coffee and tea processing centers
8. Visit to other spice processing UNITs
9. Cardamom oil extraction/value added products

**5. Skill Development in Food Preparation
(Learn to Earn Scheme)
Dairy Products – Practical**

No. of credits: 6

No. of Instructional Hours: 6 per week

1. Preparation of cream
2. Preparation of Ice cream
3. Preparation of Butter
4. Preparation of curd
5. Preparation of lassi
6. Preparation of Khoa
7. Preparation of paneer
8. Preparation of gulab jamun

Semester – II

Fruits and Vegetables Processing

No. of credits: 6

No. of Instructional Hours: 6 per week

UNIT -I : Pre-processing: Fresh fruits and vegetables – Handling, grading, cleaning, pretreatments, transportation, pre cooling, chilling, modified atmosphere packaging, Controlled atmosphere storage, packaging, transportation, quality assurance.

UNIT -II : Freezing of Fruits and Vegetables: Different freezing methods and equipments, problems associated with specific fruits and vegetables;

UNIT -III : Dehydration of Fruits and Vegetables: dehydration – different methods of drying process calculations, choice of suitable methods, preserving the colour, flavour and nutrient content of the products

UNIT - IV : Canning, Juices & Concentrates: Different UNIT operations involved in fruit and vegetable Pulp/juice extraction, concentration, packaging, juices and concentrates; aseptic packaging of fruit drinks, juices and other products Bottling, processing of Tomato and tomato products

UNIT -V : Fruit and Vegetable Products & Standards: Ready to eat vegetable products, Ketchup/sauces, Chutneys, Fruit Bar, Soup powders, Natural colors, Fruit and Vegetable Fibres - specific processing, food regulations with respect to fruit and vegetable products

Text book:

1. Potter, N.N. and Hotchkiss, J.H. “Food Science”, 5th Edition, CBS, 2001.
2. Vaclavik, V.A. and Christian, E.W. “Essentials of Food Science”, 2nd Edition, Springer, 2005.
3. Salunkhe, D.K. and Kadam, S.S. “Handbook of Fruit Science and Technology : Production, Composition, Storage, and Processing”, Marcel Dekker, 2005.

1. Fruits and Vegetables Processing (Practical)

No. of credits: 6

No. of Instructional Hours: 6 per week

1. Evaluation of pectin content
2. Canning of fruits and vegetables
3. Quality evaluation of fruits
4. Fruit preserve and candy
5. Dehydrated products of fruits
6. Dehydrated products of vegetables
7. Preparation of pickles
8. Wafers from vegetables and fruits

2. Food Quality Control and Management

No. of credits: 6

No. of Instructional Hours: 6 per week

Unit-I : Introduction to quality control in the food industry-General concepts of quality and quality control-Major quality control functions-sampling of food, sampling methods.

Unit-II : Food Adulteration-definition, adulterants-definition, classification of adulterants, harmful effects of adulterants, methods of detection of adulterants.

Unit-III: Standard tests for quality assessment-physical test-chemical test, microbial test, sensory analysis.

Unit-IV : National food legislation, essential commodities Act, standard of weight and measures Act, Export Act, BIS, Agmark, PFA, FSSAI and FPO concept and application of ISO and HACCP.

Unit-V : Overview of food spoilage-bacterial and fungal food spoilage, food poisoning, food borne infection, milk spoilage, preservations of milk and milk products spoilage.

Text book:

1. David, Shapton, Naroh.F. Shapton, Principles and Practices for the safe processing of Foods, Butterworth-Heinemann Ltd, Oxford, OX2 8DP (1991).
2. S. Manay, Shadaksharamasamy, Food: Facts and Principles.
3. Sara mora more Carol wallaPPc, HACCP. A practical Approach Chapman and Hall (1997).

3. Food Quality Control and Management (Practical)

No. of credits: 6

No. of Instructional Hours: 6 per week

1. Adulteration of milk
2. Adulteration of milk products
3. Determination of fat content of milk
4. Determination of protein in milk
5. Sensory evaluation of food products

4. Skill Development in Food Preparation - II (Learn to Earn Scheme)

No. of credits: 6

No. of Instructional Hours: 6 per week

1. Health mix
2. Flavored mix
3. Vegetable cutlet
4. Mushroom soups
5. Sprouted grains salad
6. Preparation of idly powder
7. Fruit pulp preparation
