

**LEARNING OUTCOMES-BASED CURRICULUM
FRAMEWORK (LOCF)**

in the

**UNDERGRADUATE PROGRAMME FOOD PROCESSING
TECHNOLOGY AND MANAGEMENT**

**FOR THE STUDENTS ADMITTED FROM THE
ACADEMIC YEAR 2020-2021 AND ONWARDS**



**HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)
(Affiliated to Bharathiar University and Accredited by NAAC)
COIMBATORE-641028
TAMILNADU, INDIA.**

Phone: 0422-4440555

Website: www.hindusthan.net/hicas

**HINDUSTHAN COLLEGE OF ARTS AND SCIENCE
DEPARTMENT OF FOOD PROCESSING TECHNOLOGY AND MANAGEMENT**

Preamble

Learning Outcome based curriculum framework for undergraduate education in Food Processing Technology and Management.

Vision

To become a centre of academic excellence with highly qualified, knowledgeable and competent food technologist. Innovation through knowledge exchange by collaborating with reputed institutions and industries. To empower students as responsible citizens who can work for the progress of the society

Mission

To incorporate outcome based curriculum to cater the needs of students by practicing innovative teaching methodologies both in theory and practicals. To build self confidence, impart knowledge, skills, values and optimistic thinking among the students. To recognize the creative young minds, their strength and ability to work together to reach their fullest potential. To produce skilled graduates who can be entrepreneurs, scientists or professionals in various industries

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

Under Graduates of FOOD PROCESSING TECHNOLOGY AND MANAGEMENT program will

PEO1: Understand the impact of science in societal and environmental contexts, and demonstrate the need for sustainable development

PEO2: Create, select and apply appropriate techniques and scientific resources with a professional understanding technology

PROGRAMME OUTCOME (PO)

- PO1:** Acquire, articulate, retain and apply specialized skill and knowledge relevant to food technology.
- PO2:** Design and conduct experiments with interpretation of data.
- PO3:** Prepare them for careers in the industry, agriculture, and applied research
- PO4:** Apply ethical principles in profession, communicate effectively and recognize the need for life-long learning in the era of technological change

PROGRAMME SPECIFIC OUTCOME (PSO)

- PSO1:** To prepare students as skilled scientific manpower with an understanding of Research ethics (public policy, biosafety, and intellectual property rights) to contribute to application, advancement and impartment of knowledge in the field of food technology.
- PSO2:** Production of substantial research of significance and quality sufficient for publication.
- PSO3:** Ability to present their work through written, oral, and visual presentations for food processing industries.

HINDUSTHAN COLLEGE OF ARTS & SCIENCE (AUTONOMOUS)

COIMBATORE -641028

SCHEME OF EXAMINATIONS - CBCS & LOCF PATTERN

(For the Students admitted from the Academic year 2020-2021 and onwards)

UG PROGRAMME

Programme: FOOD PROCESSING TECHNOLOGY AND MANAGEMENT

Part	Course Code	Course Type	Course Title	Lecture Hours/ Week	Exam Duration (hours)	MAX. MARKS			Credit points
						I.E	E.E	TOTAL	
Semester – I									
I	20LAT01/ 20LAH01/ 20LAM01/ 20LAF01	MIL	Tamil-I/ Hindi-I/ Malayalam – I/ French-I	6	3	30	70	100	3
II	20ENG01	AECC	English – I	6	3	30	70	100	3
III	20FPU01	DSC	Food science	5	3	30	70	100	5
III	20FPU02	DSC	Practical I – Food science	5	3	40	60	100	3
III	20FPU03	GE	Allied Food Chemistry – I	5	3	30	70	100	3
III	20FPU04	SEC	Allied: Practical II - Food Chemistry-I	3	3	40	60	100	2
IV	20FPUV01	ACC	VAC-I	2	1	50	-	50	Grade
IV	20FPUJ01	AEE	Communicative Skills	2	1	50	-	50	Grade
IV	20FPUJ02	AEE	Soft skill	2	1	50	-	50	Grade
Semester – II									
I	20LAT02/ 20LAH02/ 20LAM02/ 20LAF02	MIL	Tamil-II/ Hindi-II/ Malayalam-II/ French-II	6	3	30	70	100	3
II	20ENG02	AECC	English – II	6	3	30	70	100	3
III	20FPU05	DSC	Food Processing Technology- I (Fruits and Vegetables)	5	3	30	70	100	5
III	20FPU06	DSC	Practical III – Processing of Fruits and Vegetables	4	3	40	60	100	2
III	20FPU07	GE	Allied Food Chemistry – II	4	3	30	70	100	3
III	20FPU08	SEC	Allied: Practical IV- Food Chemistry –II	3	3	40	60	100	2

IV	20GSU01	AECC	Value Education – Human Rights	2	2	100	-	100	2
IV	20FPUV02	ACC	VAC-II	2	1	50	-	50	Grade*
IV	20FPUJ03	AEE	Communicative Skills	2	1	50	-	50	Grade*
IV	20FPUJ04	AEE	Soft Skill	2	1	50	-	50	Grade*
Semester III									
I	20LAT03 20LAH03 20LAM03 20LAF03	MIL	Tamil – III Hindi – III Malayalam – III French - III	6	3	30	70	100	3
II	20ENG03	AECC	Functional English – I	6	3	30	70	100	3
III	20FPU09	DSC	Food Packaging Technology	4	3	30	70	100	4
III	20FPU10	DSC	Dairy Technology	3	3	30	70	100	3
III	20FPU11	DSC	Practical V – Dairy Technology	3	3	40	60	100	2
III	20FPU12	GE	Allied Food Microbiology	3	3	30	70	100	3
III	20FPU13	SEC	Allied: Practical VI- Food Microbiology	3	3	40	60	100	2
IV	20GSU02	AECC	Environmental Studies	2	2	100	-	100	2
IV	20FPUV03	ACC	VAC-III	2	1	50	-	50	1
IV	20FPUJ05	SEC	Aptitude/Placement Training	2	1	50	-	50	Grade*
IV	20FPUJ06	SEC	Online Classes	2	1	-	-	-	CNC**
Semester IV									
I	20LAT04 20LAH04 20LAM04 20LAF04	MIL	Tamil – IV Hindi – IV Malayalam – IV French-IV	6	3	30	70	100	3
II	20ENG04	AECC	Functional English – II	6	3	30	70	100	3
III	20FPU14	DSC	Food Processing Technology-II (Animal Origin)	5	3	30	70	100	5
III	20FPU15	DSC	Practical VII –Processing of Foods of Animal Origin and Fermentation Technology	4	3	40	60	100	2
III	20FPU16	GE	Allied Nutrition and Dietetics	4	3	30	70	100	4
III	20FPU17	SEC	Allied Practicals VIII- Nutrition and Dietetics	3	3	40	60	100	2
III	20FPU18	SEC	Internship	-	-	100	-	100	2
IV	20GSU03	AECC	Skill Based Subject Internet Security	2	2	100	-	100	2
V	20GSU04	AECC	Extension Activity	-	-	100	-	100	Grade*
IV	20FPUV04	ACC	VAC-IV	2	1	50	-	50	1
IV	20FPUJ07	SEC	Aptitude/Placement Training	2	1	50	-	-	Grade*
IV	20FPUJ08	SEC	Online Classes	2	1	-	-	-	CNC**
Semester V									
III	20FPU19	DSC	Food Safety and Quality Management	5	3	30	70	100	5

III	20FPU20	DSC	Plantation Crop Processing	5	3	30	70	100	5
III	20FPU21	DSC	Bakery and Confectionery Technology	5	3	30	70	100	5
III	20FPU22A	DSE	Fats and Oil Processing Technology (OR)	4	3	40	60	100	4
	20FPU22 B		Food Product Development						
III	20FPU23	DSC	Practical IX- Bakery and Confectionery Technology	5	3	30	70	100	3
III	20FPU24	DSC	Practical X- Fats and Oil Processing and Product Development	3	3	40	60	100	2
III	20FPU25	SEC	Mini Project	3	-	100	-	100	3
IV	20GSU05	SEC	Non- Major Elective General Awareness	-	2	100	-	100	2
IV	20GSU06	AECC	Law of Ethics	-	2	100	-	100	2
IV	20FPUV05	ACC	VAC-V	2	1	50	-	50	1
IV	20FPUJ09	SEC	Aptitude/Placement Training	2	1	50	-	-	Grade*
IV	20FPUJ10	SEC	Online Classes	2	1	-	-	-	C/NC**
Semester VI									
III	20FPU26	DSC	Food Processing Technology-III(Cereals, Pulses and Millets)	5	3	30	70	100	5
III	20FPU27	DSC	Food Service Management	5	3	30	70	100	5
III	20FPU28	DSC	Food Processing Machineries and Sanitation	5	3	30	70	100	5
III	20FPU29 A	DSE	Marketing Management (OR)	5	3	30	70	100	4
	20FPU29 B		Statistics						
III	20FPU30	DSC	Practical XI –Food Drying and Fortification	5	3	40	60	100	3
III	20FPU31	DSC	Practical XII- Extruded Product Processing	5	3	40	60	100	3
IV	20FPUV06	ACC	VAC-VI	2	1	50	-	50	1
IV	20FPUJ11	SEC	Aptitude/Placement Training	2	1	50	-	-	Grade*
IV	20FPUJ12	SEC	Online Classes	2	1	-	-	-	C/NC**
Credits Grand Total									144

- VAC-Value Added Course (Extra Credit Courses)
- * Grades depends on the marks obtained

Range of marks	Equivalent remarks
80 and above	Exemplary
70 – 79	Very good
60 – 69	Good
50 – 59	Fair
40 – 49	Satisfactory
Below 39	Not Satisfactory = Not completed

- Part IV & V not included in total marks and CGPA calculation.
- I.E-Internal Exam
- E.E-External Exam
- JOC-Job Oriented Course
- C/NC**- Completed/ Not Completed

PASSING MINIMUM

Passing Minimum for UG 40% and for PG 50%

For UG : 35 % (25 marks) in EE and 40 % in Total Marks

For PG 50 % (35 marks) in EE and 50 in Total Marks

ABSTRACT FOR SCHEME OF EXAMINATIONS

(For the Candidates admitted during the academic year 2020 – 2021 onwards)

S.No.	Part	Course (MIL/AECC/AEE/DSC/ DSE/SEC/GE/ACC)	Papers	Credit	Total Credits	Marks	Total Marks
1	Part I	MIL	4	3	12	30+70	400
2	Part II	AECC	4	3	12	30+70	400
3	Part III	DSC	19	3/4/5	72	30+70	1900
		DSE	2	4	8	30+70	200
		SEC	6	2/3/4	13	40+60	600
		GE (THEORY)	4	3/4	13	30+70	400
4	Part IV	ACC	6	1/Grade	4	50/100	300
		SEC	8	Grade*	Grade*	-/50	200
		AEE	4	Grade*	Grade*	50	200
		AECC	6	2/Grade*	10	100	600
		Total	63		144		5200

List of Open Elective Papers

Open Electives	Courses offered by the Departments (Additional Credit Courses)
	Food Adulteration
	Nutraceuticals
	Flesh Food Processing Extrusion of Foods
	Principles of Foods Processing
	Space and military Foods
	Sports Nutrition
	Keto and Paleo diet Planning
	Basic Human Nutrition
	Hygiene and sanitation Advertising methods

List of Elective Papers/ DSE (Can choose any one of the paper as electives)		
	Course Code	Title
Electives/ DSE-I	20FPU22 A	Fats and oil processing technology (OR)
	20FPU22 B	Food product development
Electives/ DSE-II	20FPU29 A	Marketing management(OR)
	20FPU29 B	Statistics



Syllabus Coordinator



BOS-Chairman



Academic Council – Member Secretary

Co-ordinator
Academic Audit Cell
Hindusthan College of Arts & Science,
Coimbatore-641 028.



PRINCIPAL
Hindusthan College of Arts and Science
Hindusthan Gardens, Behind Naya India
Coimbatore - 641 028.

UG Courses- Scheme of Evaluation (Internal & External Components)

(For the students admitted during the academic year 2020-2021 Only)

1. Internal Marks for all UG

Components	Marks
Test I	5
Test II	5
Model Exam	10
Assignment	5
Attendance*	5
TOTAL	30

*Split-up of Attendance Marks

- ♣ 75-79 - 1 marks
- ♣ 80-84 - 2 marks
- ♣ 85-89 - 3 marks
- ♣ 90-94 - 4 marks
- ♣ 95-100 - 5 marks

2. a) Components for Practical I.E.

Components	Marks
Test-I	20
Test - II	20
Total	40

b) Components for Practical E.E.

Components	Marks
Experiments	50
Record	5
Viva	5
Total	60

3. Institutional/ Industrial Training, Mini Project and Major Project Work

Institutional /Industrial Training (I.E)		Mini Project (I.E)	Major Project Work		
Component	Marks	Marks	Component	Marks	Total Marks
Work diary	25	-	I.E		
Report	50	50	a)Attendance	10	
Viva-voce	25	50	b)Review/Work diary*	30	40
Total	100	100	E.E** a) Final report	40	
			b)Viva-voce	20	60
			Total		100

*Review is for Individual Project and Work Diary is for Group Projects
(group consisting of minimum 3 and maximum 5)

**Evaluation of report and conduct of viva voce will be done jointly by Internal and External Examiners

4. Components for Value Education (Part IV):

S.No.	Components	Marks
a)	Attendance	30 marks
	96% and above - 30 marks	
	91% to 95% - 25 marks	
	86% to 90% - 20 marks	
	75% to 85% - 10 marks	
b)	Participation in group activity	30 marks
c)	Assignment (2 x 10)	20 marks
d)	Test (1 hr for 20 marks)	20 marks
	2 out of 3 questions, 10 marks each	
	Total	100 marks

5. Guidelines for Environmental Studies (Part IV)

Components	Marks
Two Tests (each 2 hours) of 30 marks each [3 out of 5 descriptive questions 3 x 10 = 30 Marks]	60
Field visit and report (10 + 10) (At least one field trip should be arranged)	20
Two assignments (2 x 10)	20
Total	100

6. Guidelines for Skill based subject - Internet Security (Part IV)

Components	Marks
Two Tests (each 2 hours) of 40 marks each [4 out of 7 descriptive type questions 4 x 10 = 40 Marks]	80
Two assignments (2 x 10)	20
Total	100

7. Guidelines for General Awareness (Part IV)

Components	Marks
Two Tests (each 2 hours) of 50 marks each [50 objective type questions 50 x 1 = 50 Marks]	100

8. Guidelines for Law of Ethics (Part V)

Components	Marks
Two Tests (each 2 hours) of 50 marks each [5 out of 8 descriptive type questions 5 x 10 = 50 Marks]	100

9. Guidelines for Extension Activity (Part V)

No of Activities	Marks
2 x 50 (Each Activity for two days) (Activities may be Educating Rural Children, Unemployed Graduates, Self Help Group etc)	100

10. Value Added Courses and Aptitude/Placement courses:

Components	Marks
Two Test (each 1 hour) of 25 marks each QP is objective pattern (25x1=25)	50
Total	50

Guidelines:

1. The passing minimum for these items should be 40%
2. If the candidate fails to secure 40% passing minimum, he / she may have to reappear for the same in the subsequent Semesters
3. Item No's:4,5,6,7,8,9, 10 are to be treated as 100% Internal papers.
4. For item No.10, Tests conducted through online modules (Google Form/any other)

UG PATTERN
QUESTION PAPER PATTERN FOR CIA I and CIA II EXAM

Reg.No:----- Q.P.CODE:

HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)

----- DEGREE CIA-I/CIA-II EXAMINATIONS -----20---

(----- SEMESTER)

BRANCH: -----

SUBJECT NAME: -----

Time: Two Hours

Maximum:50 Marks

SECTION - A (6 x 1 = 6 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(Q.No: 1 to 6: Multiple choice/Fill up the blanks /True or False questions)

SECTION - B (4x 5 = 20 marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(Q.No: 7 to 10 Either Or type)

SECTION - C (3x 8 = 24 marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(Q.No: 11 to 13 : Either Or type)

QUESTION PAPER PATTERN FOR MODEL/END SEMESTER EXAMINATION

Reg.No:-----

Q.P.CODE:

HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)

----- DEGREE MODEL EXAMINATIONS -----20-----

(-----SEMESTER)

BRANCH : -----

SUBJECT NAME:-----

Duration: Three Hours

Maximum: 70 Marks

SECTION - A (10x1=10 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(Q.No 1 to 10 Multiple choice/Fill up the blanks /True or False questions)

(Two questions from each unit)

SECTION - B (5x4=20 Marks)

Answer ALL Question

ALL Questions Carry EQUAL Marks

(Q.No 11 to 15 Either or type)

(One question from each Unit)

SECTION- C (5x8=40 Marks)

Answer ALL Questions

ALL Questions carry EQUAL Marks

(Q.No 16 to 20 Either Or type) (One question from each Unit)

Course Code:	20FPU01	Course Title					Batch:	2020-2021 & onwards	
		FOOD SCIENCE					Semester:	I	
Hrs/Week:	5	L	5	T	-	P	-	Credits:	5

CCOURSE OBJECTIVE:

To enable the students to:

- learn the basic concepts of food science.
- understand the different methods of cooking.
- understand the classification, composition and nutritive values of various foods.
- gain knowledge on the cooking of cereals, pulses, meat, fish and poultry.
- familiarize the types of spices and beverages

COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Defining the composition of cereals and explaining the types of browning.	K1, K2, K3 &K4
CO2	Describing the effect of heat on oil absorption and illustrating the toxins in nuts and oil seeds.	K1, K2, K3 &K4
CO3	Enumerating the classification of fruits and vegetables. Explaining the storage techniques of vegetables and fruits	K1, K2, K3 &K4
CO4	Describing the composition of milk and egg, also illustrating the nutritive value of meat, poultry and fish.	K1, K2, K3 &K4

SYLLABUS

20FPU01	FOOD SCIENCE	Sem: I
Unit No.	Topics	Hours
I	Cereals and Millets Structure and composition of cereals. Wheat- structure and composition, types (hard, soft/ strong, weak) Diagrammatic representation of longitudinal structure of wheat grain. Malting, gelatinization of starch, types of browning- Maillard & caramelization. Rice-structure and composition, parboiling of rice- advantages and disadvantages. Millets- Types, Nutritive value and benefits.	12

II	<p>Pulses, Nuts and Oil Seeds, Fats and Oils Changes in Nutritive Value during Cooking, Processing and storage, cooking quality. Pulses- wet milling and dry milling, germination, soaking and fermentation. Nuts and oil seeds- role of nuts and oil seeds in cookery, toxins in nuts and oil seeds. Fats and oil seeds- types of oils, functions, effect of heat on oil absorption, rancidity</p>	12
III	<p>Vegetables and Fruits Classification, Composition and Nutritive Value, pigments, Changes in Nutritive Value and pigments of Vegetables during cooking , Ripening of Fruits, Storage of vegetables and Fruits.</p>	12
IV	<p>Milk and Milk Products and Eggs Milk - Composition, Nutritive Value, Problems Encountered in Cooking, Kinds of Milk, Types of Milk Products- Fermented and Non- fermented products. Egg- Structure, Composition and Nutritive Value, Methods of cooking, Factor affecting coagulation and foam formation, Testing freshness in Egg. Uses of Egg in Food Preparation and Storage of Eggs</p>	12
V	<p>Meat, Poultry and Fish Meat- Structure, Composition, Nutritive Value. Poultry- Classification, Structure, Composition, Nutritive Value. Fish-- Classification, Composition, Nutritive Value and Selection - Methods of cooking and its effects on changes in nutritive value of Meat, Fish and Poultry.</p>	12

Teaching methods: Lecturing, PowerPoint Projection through LCD, Assignment, Discussion, Activity, and Online – Google classroom.

TEXT BOOKS

B Srilakshmi- Food Science- New Age International, 2003, 7th edition.

REFERENCE BOOKS

1. Toledo, Romeo T., Singh, Rakesh K., Kong, Fanbin, *Fundamentals of Food Process Engineering, Springer Science & Business Media* 1999
2. Potter, N. and Hotchkiss, J.H. *Food Science, 5th Ed., CBS Publications and Distributors, Daryaganji, New Delhi, 1998.*
3. Shakuntala Manay, Shadaksharaswamy. M (2000) *Foods, Facts and Principles, New Age International Pvt Ltd Publishers, 6 th Edition, 2015.*
4. Usha Chandrasekhar, *Food Science and Application in Indian Cookery, Phoenix Publishing House P. Ltd., New Delhi, 2002*
5. Suri Malhotra, (2002) *Food Science, Nutrition and Safety, 1e*

WEB RESOURCES

- <<http://www.fao.org/3/t0567e/T0567E08.htm>>
<<http://ecoursesonline.iasri.res.in/mod/resource/view.php?id=147675>>

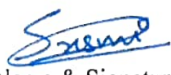
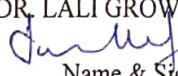
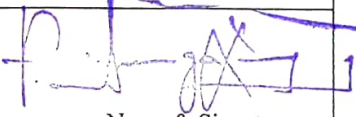
MAPPING WITH PROGRAM OUTCOMES

CO	PO	PO1	PO2	PO3	PO4
CO1		S	L	L	M
CO2		S	S	M	M
CO3		S	S	M	M
CO4		S	S	M	M

Strong, M- Medium, L – Low

ASSESSMENT PATTERN *(if deviation from common pattern)*

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
SUSMI SATHEESH KUMAR  Name & Signature of the Staff	DR. LALI GROWTHER  Name & Signature	 Name & Signature

Co-ordinator
 Curriculum Development Cell
 Hindusthan College of Arts & Science,
 Coimbatore-641 028.

Course Code:	20FPU02	Course Title					Batch:	2020-2021 & onwards	
		PRACTICAL I – FOOD SCIENCE					Semester:	I	
Hrs/Week:	5	L	-	T	-	P	5	Credits:	3

COURSE OBJECTIVE:

To enable the students to:

- obtain knowledge of different food group.
- understand various techniques of measuring foods.
- understand the effect of dry and moist heat methods of cooking.
- gain knowledge on various pulses processing technique.
- learn the preparation of various food products.

COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Describing different food groups, their nutritive value and role in day's diet	K1
CO2	Selecting different methods of cooking	K2
CO3	Preparing recipes	K3
CO4	Relating nutritive value to food selection	K4

SYLLABUS

20FPU02	PRACTICAL I – FOOD SCIENCE	Sem: I
	LIST OF EXPERIMENTS	Hours
1	Food group- Grouping of foods, discussion on nutritive value.	5
2	Measuring ingredients - Methods of measuring different types of foods – Coarse and fine cereals - grains, flours & liquids	5
3	Cooking methods - Moist heat methods – boiling, simmering, steaming, & pressure cooking. Dry heat methods – baking. Fat as a medium for cooking- shallow and deep fat frying.	5
4	Cereals - Methods of cooking fine and coarse cereals. Examination of starch	5

5	Pulses - Cooking of soaked and unsoaked pulses. Recipes with pulses.	5
6	Vegetables- Experimental cookery using vegetables of different colour & texture. Preparation of soups and salads. Recipes with vegetables.	5
7	Milk & milk products- Experimental cookery – cream of tomato soup, cheese curry & cooking vegetables in milk. Recipes with milk, cheese & curd.	5
8	Fleshy foods - Fish, meat & poultry-preparations.	5
9	Eggs- Experimental cookery- boiled egg, poached egg. Recipes with egg.	5
10	Beverages-Preparation of organic beverages.	5
11	Evaluation- Development of score card.	5
12	Developing value added foods (cereal, millet, pulse and vegetable based)	5

Note: Prepare one recipe in each food group indicating best method of cooking

Teaching methods: Hands on Experiment

TEXT BOOKS

B Srilakshmi- Food Science- New Age International, 2003, 7th edition.

REFERENCE BOOKS

- 1. Mehas, K.Y. and Rodgers, S.L. Food Science and You, McMillan McGraw Company, New York, 2000.*
- 2. Parker, R. Introduction to food Science, Delmer, Thomson Learning Co., Delma, 2000.*

WEB RESOURCES

<<https://www.stevespanglerscience.com/lab/categories/experiments/food-science/>>

<https://www.ciachef.edu/uploadedFiles/Pages/Admissions_and_Financial_Aid/Educators/Educational_Materials/Technique_of_the_Quarter/techniques-egg-cookery.pdf>

MAPPING WITH PROGRAM OUTCOMES

CO	PO	PO1	PO2	PO3	PO4
CO1		S	M	S	M
CO2		S	M	M	M
CO3		S	M	S	M
CO4		S	S	M	M

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
SUSMI SATHEESH KUMAR  Name & Signature of the Staff	DR. LALI GROWTHER  Name & Signature	 Name & Signature

Curriculum Development Cell
Hindustan University, Science,
Coimbatore-571022.

Course Code:	20FPU03	Course Title					Batch:	2020-2021 & onwards	
		ALLIED FOOD CHEMISTRY- I					Semester:	I	
Hrs/Week:	5	L	5	T	-	P	-	Credits:	3

COURSE OBJECTIVE:

To enable the students to:

- understand the types and physicochemical properties of water
- gain knowledge on carbohydrates types and characteristics of food starches
- know the proteins role in processing of food
- learn the characteristic changes in lipids
- To acquire knowledge on different food additives and pigments used in food industry

COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Describing the physico chemical changes in food and illustrating the water activity and role of water in foods.	K1, K2, K3, K4
CO2	Identifying the components and characteristics of food starch and explains the gelatinization and crystallization process of carbohydrates.	K1, K2, K3, K4
CO3	Memorizing the properties of proteins and lipids and analyzing their effects on food.	K1, K2, K3, K4
CO4	Examining the role of non nutritive components in foods and enumerating the types and role of food additives in food.	K1, K2, K3, K4

SYLLABUS

20FPU03	ALLIED FOOD CHEMISTRY- I	Sem: I
Unit No.	Topics	Hours
I	Physico Chemical Changes in Foods Introduction, Physical properties of water, structure of water and ice, types of water in foods, water activity in foods, water soluble interactions, role of water in food systems, Hydrogen ion concentration (pH), Solubility, Solutions, Crystallization, Foams, Stabilisers . Oxidation – reduction, ,Osmosis	12
II	Chemistry of Carbohydrates Components and characteristics of food starches, non starch polysaccharides, Swelling of starch granules, Gel formation, factors affecting gelatinization, retrogradation, syneresis. Stages of sugar cookery, Crystal formation, factors affecting, types of candies, Action of Acid, Alkali and Enzymes, Non enzymatic browning	12
	Chemistry of Proteins Structural Properties of proteins-electrophoresis, sedimentation, amphoterism	12

III	coagulation and denaturation, Functional properties of proteins -organoleptic, solubility, viscosity, binding gelation/texturization, emulsification, foaming. Gluten formation, effect of soaking, fermentation and germination, Action of Heat, Acid and Alkali on vegetable and animal proteins-egg, milk, meat fish.	
IV	Chemistry of Lipids Classification of lipids- Physical properties-melting point, softening point, specific gravity, refractive index, smoke, flash and fire point, turbidity point. Chemical properties-Reichert meissel value, Polenske value, iodine value, peroxide value, saponification value. Effect of frying on fats, Changes in fats and oils- rancidity, lipolysis, flavor reversion, Auto-oxidation and its prevention, Technology of edible fats and oils- Refining, Hydrogenation and Interesterification, Fat Mimetics.	12
V	Chemistry of Additives Pectins, phenolic components, vegetable gums, volatile compounds, Active principles of spices and condiments. Food additives- Definition, types of food additives, role in food processing Flavours- Definition and basic tastes- Chemical structure and taste-Description of food flavours- Flavour enhancers.	12

Teaching methods: Lecturing, PowerPoint Projection through LCD, Assignment, Discussion and Activity.

TEXT BOOKS

Manay, S. and Shadaksharamasamy, Food: Facts and Principles, New Age International (P) Publishers, New Delhi.

REFERENCE BOOKS

1. Paul, P.C., and Palmer, H. H., *Food Theory and Applications*. John Wiley and Sons, Newyork, 2000 Revised Edition
2. Srinivasan Damodaran, Kirk L. Parkin, Owen R. Fennema. *Fennema's Food Chemistry – 4th Edition*, CRC Press, Taylor & Francis group, USA, ISBN-9780849392726. 2007
4. H.D. Belitz, W. Grosch, P. Schieberle *Food Chemistry – 4th revised and extended edition*, Springer-Verlag Berlin Heidelberg, ISBN 978-3-540- 69933-02009
5. Meyer, L.H. 1987. *Food Chemistry*. CBS publishers and Distributors, New Delhi.
6. John M deMan, *Principles of Food Chemistry – 3rd edition*, Springer New York Heidelberg Dordrecht London ISBN 9781461463900 (eBook). 1999

WEB RESOURCES

<https://www.academia.edu/27799682/Principles_of_Food_Chemistry_Third_Edition>

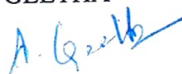

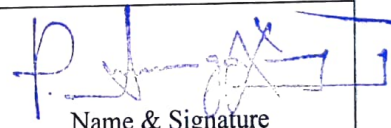
MAPPING WITH PROGRAM OUTCOMES

CO	PO	PO1	PO2	PO3	PO4
CO1		L	S	M	L
CO2		M	S	M	M
CO3		S	S	M	M
CO4		M	S	M	M

ASSESSMENT PATTERN (if deviation from common pattern)

S-Strong, M- Medium, L – Low

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
Dr. A. GEETHA  Name & Signature of the Staff	DR. LALI GROWTHER  Name & Signature	 Name & Signature

Coordinator
 Curriculum Development Cell
 Hindusthan College of Arts & Science,
 Coimbatore-641 025.

5	Factors affecting fat absorption of shallow and deep fried foods	5
6	Effect of soaking time, types of water, cooking, acid, alkali and germination on pulses.	4
7	Preparation of cottage cheese-panner, Setting of curds	5
8	Determination of the strength of pectin in different fruits and vegetable extracts.	5

Teaching methods: Hands on Experiments

TEXT BOOKS

1. Text Book: Chandrasekhar. U, Food Science and Applications in Indian Cookery, Phoenix Publishing House Pvt Ltd, New Delhi, 2002.
2. Reference Books: Paul, P.C., and Palmer, H. H., Food Theory and Applications. John Wiley and Sons, New York, 2000 Revised Edition.
3. Fennema O.R. Food Chemistry, Fourth Edition, Marcel Dekker, 1996.
4. Manay, S. and Shadaksharamasamy, Food: Facts and Principles, New Age International (P) Publishers, New Delhi.

WEB RESOURCES

- <https://fssai.gov.in/upload/uploadfiles/files/Revised-method-acid-value_Oils_Fats_20_02_2018.pdf>
 <<https://labmonk.com/determination-of-saponification-value-of-the-given-oil-fat>>


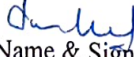

MAPPING WITH PROGRAM OUTCOMES

CO	PO	PO1	PO2	PO3	PO4
CO1		L	S	M	M
CO2		M	S	M	M
CO3		M	S	M	M
CO4		M	S	M	M

S-Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
Dr. A. GEETHA  Name & Signature of the Staff	DR. LALI GROWTHER  Name & Signature	 Name & Signature

Co-ordinator
 Curriculum Development Cell
 Hindusthan College of Arts & Science,
 Coimbatore-641 028.

Course Code:	20FPU05	Course Title						Batch:	2020-2021 & onwards
		FOOD PROCESSING TECHNOLOGY I (Fruits and Vegetables)						Semester:	II
Hrs/Week:	5	L	5	T	Hrs/Week:	5	L	5	T

COURSE OBJECTIVE:

To enable the students to:

- impart knowledge on commonly grown crops in India.
- learn the production and storage of food grains, Fruits and vegetables.
- understand the composition and milling of cereals, millets and pulses and their products.
- gain knowledge on the processing of nuts, oils and fats, beverages, spices and condiments.
- create awareness about processing of various extruded and fortified foods.
- find out the changes in food by chemical reaction

COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Describing the concepts of processing of fruits and vegetables and interpreting post harvesting of fruits and vegetables.	K1, K2, K3, K4
CO2	Identifying the characteristics of fruits and vegetables and interpreting the ripening process of fruits.	K1, K2, K3, K4
CO3	Identifying the storage of fruits and focusing on packing and transportation of fruits and vegetables.	K1, K2, K3, K4
CO4	Describing fermented products and experimenting with the processing of various food products and focusing drying and dehydration of fruits.	K1, K2, K3, K4

SYLLABUS

20FPU05	FOOD PROCESSING TECHNOLOGY I (FRUITS AND VEGETABLES)	Sem: II
Unit No.	Topics	Hours
I	Post-harvest management- Post-harvest management of fruits and vegetables- control of losses in harvesting and handling operations. Scope of fruits and vegetables processing industry in India. Present status, constraints and prospects.	12

II	Physio-Chemical Characteristics of Fruits and Vegetables- Morphology, structure and composition of fruits and vegetables. Maturity standards: Importance, methods of maturity determinations, maturity indices for selected fruits and vegetables. Harvesting of important fruits and vegetables. Fruit ripening: chemical changes, regulations, methods.	12
III	Storage and Transportation Techniques- Storage practices: Modified & Controlled atmospheric storage, hypobaric storage, cold storage. Commodity treatments- chemicals, wax coating, pre-packaging. Post-Harvest handling, packaging & transport system for various fruits & vegetables and packaging house operations.	12
IV	Processed Products of fruits and vegetables Commercial processing of major fruits and vegetables -jam, jellies, marmalade, purees, candy, energy bar. Processing technology for manufacturing of fruit juices, RTS beverage, squash, Carbonated beverages. Processing of Tomato: paste, ketchup, sauce, puree, soup.	12
V	Fermentation and Dehydration of Fruits and Vegetables- Drying and dehydration technology of fruits and vegetables: preparation of raisins, anardana, dried fig, dried leafy vegetables, juice powders, flakes, chips. Fermented fruits and vegetables products like sauerkraut, pickles, and wines.	12

Teaching methods: Lecturing, PowerPoint Projection through LCD, Assignment, Discussion, Activity, and Online – Google classroom.

TEXT BOOKS

Subbalakshmi G, Udipi SA. Food processing and preservation, New Age International Publishers, Delhi 2007.

TEXT BOOKS

1. Khurdia DS. *Preservation of fruits and vegetables. Indian Council of Agriculture Research, New Delhi 1995.*
2. Siddhapa GS, Lal G and Tandon. *Preservation of fruits and vegetables. Indian Council of Agriculture Research, New Delhi 1998.*
3. Srivastava SS. *Phal Parirahshan. Kitab Mahal, Lucknow 2006.*
4. Ramaswamy H and Marcott M. *Food Processing Principles and Applications. CRC Press, 2005.*

WEB RESOURCES

<<http://www.fao.org/tempref/docrep/fao/004/y2515e/Y2515E02.pdf>>
https://www.researchgate.net/publication/279192433_Juice_Processing

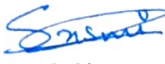
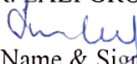

MAPPING WITH PROGRAM OUTCOMES

CO	PO	PO1	PO2	PO3	PO4
CO1		S	M	S	M
CO2		S	M	M	M
CO3		S	M	M	M
CO4		S	M	L	M

Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
SUSMI SATHEESH KUMAR  Name & Signature of the Staff	DR. LALI GROWTHER  Name & Signature	 Name & Signature

Co-ordinator
Curriculum Development Cell
Hindusthan College of Arts & Science,
Coimbatore-641 028.

Course Code:	20FPU06	Course Title						Batch:	2020-2021 & onwards
		PRACTICAL III – PROCESSING OF FRUITS AND VEGETABLES						Semester:	II
Hrs/Week:	4	L	-	T	-	P	4	Credits:	2

COURSE OBJECTIVE:

To enable the students to:

- develop practical knowledge on practical techniques on canning and pickling process
- impart knowledge on various methods of preserving fruits and vegetables
- gain knowledge on preparation of fruit juices
- develop practical knowledge on fruit jam and jelly
- impart knowledge different methods of drying of food

COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Stating the preparation of fruit jam and jelly	K1
CO2	Summarizing preservation of foods.	K2
CO3	Preparing fruit juices.	K3
CO4	Comparing different methods of drying of food	K4

SYLLABUS

20FPU06	PRACTICAL III - PROCESSING OF FRUITS AND VEGETABLES	Sem: II
	LIST OF EXPERIMENTS	Hours
1	Canning/bottling of mango/guava/papaya fruits.	5
2	Preparation of fruit jam.	5
3	Preparation of fruit jelly	6
4	Preparation of fruit marmalade	5
5	Preparation of fruit candy/ toffee and energy bar.	5

6	Preparation of fruit RTS beverage and squash	5
7	Preparation of fruit wines.	6
8	Preparation of pickle	6
9	Preparation of anardana, dried ginger/ amchur/ onion and garlic.	5

Teaching methods: Hands on Experiments

TEXT BOOKS

Ramaswamy H and Marcott M. Food Processing Principles and Applications. CRC Press, 2005.

WEB RESOURCES

National Center for Home Food Preservation. <http://nchfp.uga.edu/>

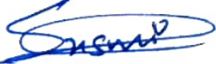

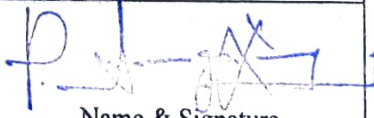
MAPPING WITH PROGRAM OUTCOMES

CO	PO	PO1	PO2	PO3	PO4
CO1		S	M	L	M
CO2		S	S	M	M
CO3		S	M	L	M
CO4		S	M	M	M

Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
SUSMI SATHEESH KUMAR  Name & Signature of the Staff	DR. LALI GROWTHER  Name & Signature	 Name & Signature

Course Code:	20FPU07	Course Title						Batch:	2020-2021 & onwards
		ALLIED - FOOD CHEMISTRY-II						Semester:	II
Hrs/Week:	4	L	4	T	-	P	-	Credits:	3

COURSE OBJECTIVE:

To enable the students to

- gain knowledge the structure and properties of minerals
- impart knowledge food enzymes
- outline to the changes occurring during food preservation
- impart knowledge on food pigments
- gain knowledge on the properties of colloids and emulsion

COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Identifying the effects of cooking on nutrition and explains the interaction of food and medium of cooking	K1, K2, K3, K4
CO2	Categorizing natural pigments and examining its changes when exposed to heat, acid and alkali.	K1, K2, K3, K4
CO3	Describing the properties of enzymes and illustrates changes occurring during processing of food products	K1, K2, K3, K4
CO4	Memorizing the properties of colloids and emulsion and infers its application in food processing	K1, K2, K3, K4

SYLLABUS

20FPU07	ALLIED - FOOD CHEMISTRY-II	Sem: II
Unit No.	Topics	Hours
I	Effect of Cooking Effect of cooking on the different nutrients, nutritional value of individual foods. Effect of the medium of cooking on foods – Dry heat and moist heat methods. Retention of nutrients in different cooking methods. Enhancing nutritive value of foods.	10
II	Natural food pigments Introduction and classification- water and fat soluble pigments (chlorophyll, carotenoids, anthocyanins and anthoxanthins, lycopene, betalain,) Action of heat, acid and alkali on vegetable pigments, enzymatic browning reactions in fruits and vegetables, preventive measures.	10
III	Emulsion and colloids Emulsion –Types, Properties, emulsifying agents, natural and synthetic emulsifiers. Colloids systems in food, types, properties. Gels, properties, factors affecting gel formation	10
IV	Enzymes Enzymes in foods - Nature of enzymes, stability and action. Proteolytic enzymes, oxidases, lipases, enzymes decomposing carbohydrates and applications. Enzymes in food fermentations. Immobilized enzymes.	09
V	Food processing treatments Drying-Methods of drying-sun drying, freeze drying-drying by mechanical driers and dehydration-Low temperature methods, Irradiation, Freezing-methods of freezing foods, Canning	09

Teaching methods: Lecturing, PowerPoint Projection through LCD, Assignment, Discussion, Activity, and Online – Google classroom.

TEXT BOOKS

Chandrasekhar.U, Food Science and Applications in Indian Cookery, Phoenix Publishing House Pvt

REFERENCE BOOKS

1. *Food Science by Norman.N.Potter.*
2. *Experimental study of Foods by Griswold R.M.*
3. *Food Science by Helen Charley.*
4. *Foundation of Food Preparation by A.G.Peckam.*
5. *Manay, S. and Shadaksharamasamy, Food: Facts and Principles, New Age International (P) Publishers, New Delhi.*

WEB RESOURCES

<https://www.researchgate.net/publication/315712936_Natural_food_pigments_application_in_food_products>

<<https://www.britannica.com/topic/food-preservation>>

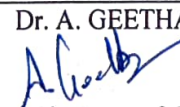
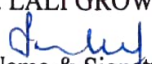
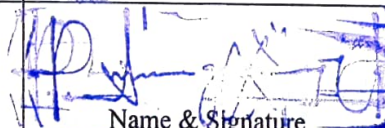
MAPPING WITH PROGRAM OUTCOMES

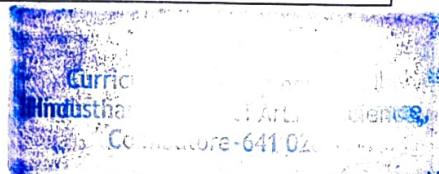
CO	PO	PO1	PO2	PO3	PO4
CO1		L	M	S	M
CO2		M	S	M	M
CO3		M	M	M	M
CO4		M	S	S	M

Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
Dr. A. GEETHA  Name & Signature of the Staff	DR. LALI GROWTHER  Name & Signature	 Name & Signature



Course Code:	20FPU08	Course Title						Batch:	2020-2021 & onwards
		ALLIED: PRACTICAL-IV –FOOD CHEMISTRY-II						Semester:	II
Hrs/Week:	3	L	-	T	-	P	3	Credits:	2

COURSE OBJECTIVE:

To enable the students to

- impart practical knowledge on the analysis of biomolecules
- illustrate knowledge on the characterization of biomolecules
- gain knowledge on pigments in food
- impart practical knowledge on enzymatic browning
- illustrate knowledge on emulsions, colloids and gels

COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Recognizing the retention of nutrients in cooked foods	K1
CO2	Identifying the presence of pigments	K2
CO3	Demonstrating enzymatic browning	K3
CO4	Analyzing emulsions, colloids and gels	K4

SYLLABUS

20FPU08	ALLIED PRACTICAL IV - FOOD CHEMISTRY-II	Sem: II
LIST OF EXPERIMENTS		Hours
1	Estimation of nutrient retention in different cooking methods	5
2	Determination of thermal inactivation time of enzymes in fruits and vegetables	5
3	Effect of acid, alkali and heat on vegetable pigments	5
4	Enzymatic Browning and its prevention	5
5	Preparation of gels and colloids	5
6	Drying methods- Sun- drying, shadow drying and cabinet drying	6

7

Effect of Enzymes in Food fermentation-demo

5

Teaching methods: Hands on Experiments**TEXT BOOKS**

1. Chandrasekhar. U , *Food Science and Applications in Indian Cookery*, Phoenix Publishing House Pvt Ltd, New Delhi, 2002

REFERENCE BOOKS

1. *Food: Facts and Principles*, Manay, S. and Shadaksharamasamy New Age international (P) Publishers, New Delhi.
2. *Food Science* by Norman. N. Potter.
3. *Experimental study of Foods* by Griswold R.M.
4. *Food Science* by Helen Charley.

WEB RESOURCES

- <https://nanopdf.com/download/the-effect-of-heat-and-ph-on-vegetables_pdf>
<<https://pdfs.semanticscholar.org/e81e/d977edcb1f121a76de7ca602b43fc0b056f6.pdf>>




MAPPING WITH PROGRAM OUTCOMES

CO	PO	PO1	PO2	PO3	PO4
CO1		S	S	L	M
CO2		S	S	M	M
CO3		S	S	M	M
CO4		M	S	M	M

Strong, M- Medium, L – Low

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Co-coordinator
Dr. A. GEETHA 	DR. LALI GROWTHER 	
Name & Signature of the Staff	Name & Signature	Name & Signature

BACHELOR SCIENCE OF FOOD PROCESSING TECHNOLOGY AND MANAGEMENT

Programme Code:	FPU	Programme Title: Bachelor Science of Food Processing Technology and Management		
Course Code:	20FPU09	Course Title	Batch:	2020-2021 and Onwards
		FOOD PACKAGING TECHNOLOGY		III
Hrs/Week:	4		Credits:	4

Course Objectives

To enable the students to

- impart knowledge on various packaging techniques.
- outline the changes occurring during food packaging.
- knowledge on different packaging materials.
- understand various preservation techniques.

Course Outcomes (CO)

K1, K2, K3, K4	CO1	Describing shelf life in food packaging and focusing on preservation by thermal processing.
K1, K2, K3, K4	CO2	Describing the methods of preservation and interpreting the preparation of fruit juice products.
K1, K2, K3, K4	CO3	Listing various packaging practices and applying different packaging materials.
K1, K2, K3, K4	CO4	Interpreting various methods of packaging and analyzing standards of food labeling and report consumer education on food labeling.

Code No	Subject	Semester No
20FPU09	FOOD PACKAGING TECHNOLOGY	III
Unit No	Topics	Hours
Unit I	Preservation by Thermal processing Importance of food preservation, preservation by the use of temperature- low-refrigeration, freezing, preservation by the use of high temperature - drying, dehydration, sun drying, solar drying and dehydration, method of drying (convectonal, conduction ,irradiation, dielectric), mechanical dehydration.	10
Unit II	Preservation by Chemical Methods Preservation by using sugar- sugar concentrates – principles of gel formation, preservation by using chemicals and salts fermentation definition, types of fermentation, advantages – preparation and preservation of fruit juices, RTS-pickling.	10
Unit III	Packaging Materials Properties of packaging materials in relation to their functions (paper, glass, jute, wood, metal containers, flexible packaging materials, laminates), edible packaging, nano composite in food packaging.	10
Unit IV	Packaging Methods Form fill seal packaging, hermetic closures, retortable pouches, aseptic packaging, inert gas packaging, active & intelligent packaging, vacuum packaging, CAP- Controlled Atmospheric Packaging and MAP- Modified Atmospheric Packaging.	09
Unit V	Food and Nutrition Labelling Standard labelling information and format. Storage use and care instructions. Nutrition facts panel. Standards and regulations: Ingredients, health claims, expiry date. The use of food labeling in consumer education.	09

Text Book:

1. Subbulakshmi G , 2006, *Food Processing And Preservation, new age International Pvt. Ltd.,ND*


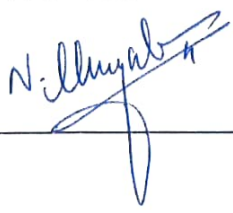
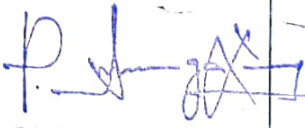
Reference Books

1. Potter, N.N., 2007, *Food Science, CBS Publishers, ND.*
2. Srilakshmi, B., 2012, *Food Science, New Age International Pvt. Ltd.,ND.*
3. Manay, N.S., 2005, *Foods: Facts & Principles, Wiley Eastern Ltd.,ND.*

Mapping of Outcomes

CO	PO	PO1	PO2	PO3	PO4
CO1	S	S	M	S	
CO2	S	M	S	M	
CO3	S	M	S	L	
CO4	S	S	S	S	

S - Strong; M-Medium; L-Low.

Course Designed by	Verified by HOD	Approved by
DEEPIKA .S 	Dr. N. MURUGALATHA 	

Co-ordinator
Curriculum Development Ce
Hindusthan College of Arts & Sci
Coimbatore-641 023.

BACHELOR SCIENCE OF FOOD PROCESSING TECHNOLOGY AND MANAGEMENT

Programme Code:	FPU	Programme Title: Bachelor Science of Food Processing Technology and Management		
Course Code:	20FPU10	Course Title	Batch:	2020-2021 and Onwards
		DAIRY TECHNOLOGY		III
Hrs/Week:	3		Credits:	3

Course Objectives

To enable the students to

- understand the properties of milk and gain knowledge on handling and processing
- familiarize with the types of equipment used in milk processing
- acquire knowledge about manufacturing of milk products
- impart knowledge on quality control measures applied in dairy industries.

Course Outcomes (CO)

K1, K2, K3, K4	CO1	Defining milk, relating the sources of milk and analyzing composition of milk.
K1, K2, K3, K4	CO2	Memorizing types of cooling systems and identifying the processing of milk and focusing on the storage of dairy products.
K1, K2, K3, K4	CO3	Listing different types of milk and interpreting the processing of milk.
K1, K2, K3, K4	CO4	Selecting different cleaning system in dairy plant and practicing personal hygiene in dairy plant and analyzing the basic idea about the processing and products.

Code No	Subject	Semester No
20FPU10	DAIRY TECHNOLOGY	III
Unit No	Topics	Hours
Unit I	Introduction Milk - definition, composition and nutritive value of milk, types of milk, factors affecting composition of milk, physiochemical properties of milk, grading of milk - definition and types of grades, collection and transportation of milk.	06
Unit II	Processing of Market Milk Flowchart of milk processing, reception, different types of cooling systems. clarification and filtration process, standardization- pearson's square method, pasteurization - LTLT, HTST and UHT process-continuous pasteurizer, sterilization and homogenization, cream separation - centrifugal cream separator.	08
Unit III	Special Milks Skim milk, evaporated milk, condensed milk, standardized milk, toned milk, double toned milk, flavoured milk, reconstituted milk.	06
Unit IV	Indigenous and Fermented Milk products Product description, methods for manufacture of butter, cheese, ice cream, khoa, channa, paneer, shrikhand, ghee. Spray drying system: dried milk- whole milk and skim milk powder. Instantization of milk.	08
Unit V	In-Plant Cleaning System Introduction to Cleaning in- place (CIP) system - cleaning procedure, cleaning efficiency, methods of cleaning in food industry, cleaning solutions – detergents, sanitizers. SIP system of dairy plant, Personal hygiene in dairy plant.	08

Text Book:

1. Sukumar De 2001, *Outlines of Dairy Technology*, Oxford Publisher.

Reference Books


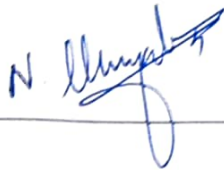

1. Srilakshmi, B., 2001, *Food Science*, New Age International Pvt. Ltd., ND.

2. Manay, N, S., 2001, *Foods : Facts & Principles*, Wiley Eastern India Ltd., ND.

Mapping of Outcomes

PO	PO1	PO2	PO3	PO4
CO				
CO1	S	S	S	S
CO2	S	M	S	S
CO3	M	M	S	S
CO4	M	M	L	S

S - Strong; M-Medium; L-Low

Course Designed by	Verified by HOD	Approved by
DEEPIKA .S 	Dr. N. MURUGALATHA 	

Co-ordinator
Curriculum Development Cell
Hindusthan College of Arts & Science,
Coimbatore-641 028.

BACHELOR SCIENCE OF FOOD PROCESSING TECHNOLOGY AND MANAGEMENT

Programme Code:	FPU	Programme Title: Bachelor Science of Food Processing Technology and Management		
Course Code:	20FPU11	Course Title	Batch:	2020-2021 and Onwards
		PRACTICAL V- DAIRY TECHNOLOGY		III
Hrs/Week:	3		Credits:	2

Course Objectives

To enable the students to

- gain knowledge about preparation of dairy products
- perform chemical analysis of milk sample
- understand different processing equipment in dairy plant
- impart knowledge on milk testing

Course Outcomes (CO)

K1	CO1	Listing the products that can be made from milk.
K2	CO2	Demonstrating the processing of dairy products.
K3	CO3	Applying the quality control measures by testing of milks.
K4	CO4	Inference the basic idea about the processing and products of milk

Code No	Subject	Semester No
20FPU11	PRACTICAL V- DAIRY TECHNOLOGY	III
S.No	LIST OF EXPERIMENTS	No of Hrs
1	Milk testing - platform tests.	4
2	Clot on boiling test for milk.	3
3	Detection of addition of starch in milk.	3
4	Preparation of lassi.	3
5	Preparation of khoa.	4
6	Preparation of basundi, chakka and shrikand.	4
7	Preparation of preparation of cooking butter.	3
8	Preparation of ghee.	3
9	Preparation of flavoured milk.	3
10	Visit to Dairy industry	6

Text book:

1. Lab manual prepared by faculty

Reference Books


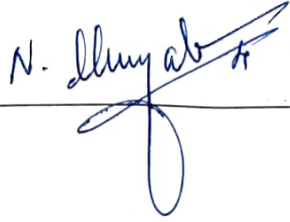
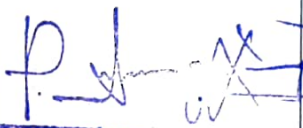
1. Srilakshmi, B., 2001, Food Science, New Age International Pvt Ltd.,ND.

2. Manay, N.S., 2001, Foods : Facts & Principles, Wiley Eastern India Ltd., ND.

Mapping of Outcomes

PO	PO1	PO2	PO3	PO4
CO				
CO1	S	M	S	M
CO2	S	M	M	S
CO3	S	M	S	S
CO4	M	M	S	S

S - Strong; M-Medium; L-Low

Course Designed by	Verified by HOD	Approved by
DEEPIKA.S 	Dr. N. MURUGALATHA 	

Co-ordinator
Curriculum Development Cell
Hindusthan College of Arts & Science
Coimbatore-641 028.

BACHELOR OF FOOD PROCESSING TECHNOLOGY AND MANAGEMENT

Programme Code:	FPU	Programme Title: Bachelor Science of Food Processing Technology and Management		
Course Code:	20FPU12	Course Title	Batch:	2020-2021 and Onwards
		ALLIED FOOD MICROBIOLOGY		III
Hrs/Week:	3		Credits:	3

Course Objectives

To enable the students to

- learn the types, structure and characteristics of microorganisms
- understand the factors affecting the growth of microorganism
- learn the causes of food spoilage and food borne disease
- gain knowledge about microorganisms important in food industry

Course Outcomes (CO)

K1, K2, K3, K4	CO1	Labeling the characteristics of important pathogens and identifying the spoilage microorganisms in foods. Illustrating the factors influencing microbial growth.
K1, K2, K3, K4	CO2	Identifying the microbes involved in contamination of food products and focusing on preservation methods.
K1, K2, K3, K4	CO3	Identifying the microbes involved in contamination of milk products and focusing on preservation methods.
K1, K2, K3, K4	CO4	Analyzing the role of microorganisms in spoilage of fermented products and illustrating food quality assurance and dairy hygiene.

Code No	Subject	SemesterNo
20FPU12	ALLIED FOOD MICROBIOLOGY	III
Unit No	Topics	Hours
Unit I	Food Microflora and Preservation of Foods Introduction- Importance of food microbiology – types of microorganisms in food – factors influencing microbial growth of food (extrinsic and intrinsic)	06
Unit II	Food Preservation Contamination and spoilage – cereals, sugar products, vegetables and fruits, meat and meat products, milk and milk products, fish and seafood – poultry, spoilage of canned foods. Food poisoning and food borne infections – bacterial and mycotoxins. Principles of food preservation – Asepsis – physical and chemical methods.	08
Unit III	Dairy Microbiology Milk - definition, composition and types of milk (skimmed, toned and homogenized. Microbial analysis of milk - microflora of raw milk - dye reduction test (using methylene blue and resazurin) - total bacterial count- brucella ring test and tests for mastitis - somatic cell count, pasteurization of milk, milk borne diseases.	08
Unit IV	Fermented Foods Spoilage in Fermented foods – pickled cucumber, saurkraut-soysauce, bread, idli – fermented dairy products – yoghurt and cheese.	06
Unit V	Food Quality Assurance and Dairy Hygiene Food laws and regulation – FSSAI- BIS- AGMARK- HACCP - Codex alimentarius – ISO standards. Industry hygiene cleaning of dairy equipment - in-plant cleaning system. food processing plant sanitation - utilization and disposal of dairy by product– whey. GMP and GLC.	08

Text Book:

1. Adams M.R. and M.O. Moss., 2015, "Food Microbiology", The royal Society of Chemistry, Cambridge, New York.


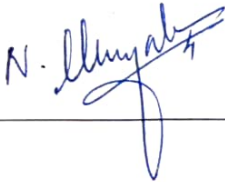

Reference Book

1. Fraizer W.C. and Westhoff D.C., 2017, "Food Microbiology", TATA McGraw Hill Publishing Company Ltd. New Delhi.

Mapping of Outcomes

CO \ PO	PO1	PO2	PO3	PO4
CO1	S	M	L	S
CO2	S	S	L	S
CO3	S	M	M	S
CO4	S	S	M	S

S - Strong; M-Medium; L-Low.

Course Designed by	Verified by HOD	Approved by
SUSMI SATHEESHKUMAR 	Dr. N. MURUGALATHA 	

Co-ordinator
Curriculum Development Cell,
Hindusthan College of Arts & Science,
Coimbatore-641 028.

BACHELOR OF FOOD PROCESSING TECHNOLOGY AND MANAGEMENT

Programme Code:	FPU	Programme Title: Bachelor Science of Food Processing Technology and Management		
Course Code:	20FPU13	CourseTitle	Batch:	2020-2021 and Onwards
		ALLIED PRACTICAL VI -FOOD MICROBIOLOGY		III
Hrs/Week:	3		Credits:	2

Course Objectives

To enable the students to

- learn and apply cleaning and sterilization techniques
- differentiate between the types of microorganisms
- perform staining methods
- determine the portability of water

Course Outcomes (CO)

K2	CO1	Interpreting the characteristics of important pathogens and spoilage microorganisms in foods.
K2	CO2	Observing the role and significance of intrinsic and extrinsic factors on growth and response of microorganisms in foods.
K1	CO3	Identifying ways to control microorganisms in foods
K2	CO4	Illustrating the beneficial role of microorganisms

Code No	Subject	Semester No
20FPU13	ALLIED: PRACTICAL VI - FOOD MICROBIOLOGY	III
S. No	Topics	No of Hrs
1	Introduction to the basic microbiology laboratory practices and equipments	3
2	Preparation and sterilization of nutrient broth and media	4
3	Morphological study of bacteria and fungi using permanent slides	3
4	Simple staining and Gram's staining	4
5	Standard plate count method	4
6	Bacteriological analysis of water	4
7	Assessment of surface sanitation by swab/rinse method	4
8	Assessment of personal hygiene	3
9	Scheme for the detection of food borne pathogens	4
10	Implementation of FSMS – HACCP, ISO : 22000	3

Text Book:

1. Adams M.R. and M.O. Moss., 2015, "Food Microbiology", The royal Society of Chemistry, Cambridge, New York.


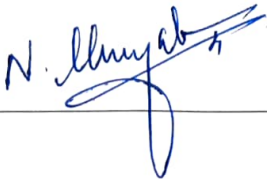
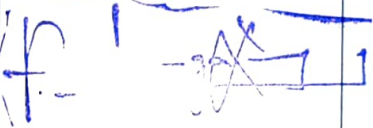
Reference Book

1. Fraizer W.C. and Westhoff D.C., 2017, "Food Microbiology", TATA McGraw Hill Publishing Company Ltd. New Delhi.

Mapping of Outcomes

PO CO	PO1	PO2	PO3	PO4
CO1	M	S	L	S
CO2	S	S	M	S
CO3	M	M	L	M
CO4	S	S	M	S

S - Strong; M-Medium; L-Low.

Course Designed by	Verified by HOD	Approved by
SUSMI SATHEESHKUMAR 	Dr. N. MURUGALATHA 	

Curriculum Development Cell
Hindustan College of Science
Coimbatore

BACHELOR OF FOOD PROCESSING TECHNOLOGY AND MANAGEMENT

Programme Code:	FPU	Programme Title: Bachelor Science of Food Processing Technology and Management		
Course Code:	20FPU14	Course Title	Batch:	2020-2021 and Onwards
		FOOD PROCESSING TECHNOLOGY-II (ANIMAL ORIGIN)		IV
Hrs/Week:	5		Credits:	5

Course Objectives

To enable the students to

- study the processing techniques of animal food products.
- gain knowledge on equipments used in processing of animal foods
- familiarize with the preservation and quality standards.
- understand different animal foods and its products

Course Outcomes (CO)

K1, K2, K3, K4	CO1	Differentiating and examining the principles of different food processing.
K1, K2, K3, K4	CO2	Illustrating various measures to check egg quality , grading and explaining the method of preservation.
K1, K2, K3, K4	CO3	Identifying various techniques in preparation of different milk products and illustrating the classification of milk
K1, K2, K3, K4	CO4	Describing various processing techniques of meat and classifying fish and its products.

Code No	Subject	Semester No
20FPU14	FOOD PROCESSING TECHNOLOGY-II (ANIMAL ORIGIN)	IV
Unit No	Topics	Hours
Unit I	Introduction to Food Processing Nature and properties of food, fluid and visco elastic behavior of foods, principles of different food processing such as membrane filtration (ultra, osmosis and reverse osmosis, dialysis), pulsed electric, irradiation, high pressure processing and hurdle technology.	12
Unit II	Processing of Egg and its Products Structure and composition of egg. Measures of egg quality and grading and preservation. technology of egg products – egg powder- whole egg powder, egg yolk powder, albumen flakes and liquid frozen egg.	12
Unit III	Processing of Milk and Milk Products Milk – types of milk -drying of whole and skim milk (milk powder), cream separation, churning of butter, classification and preparation of cheese, probiotic milk products - yoghurt, dahi and probiotic ice- cream, indigenous milk products - khoa, gulab jamun, rasagola, srikhand, paneer and ghee.	12
Unit IV	Processing of Fish and its Products Classification of fish; procurement/ selection of fish. Canning of fish and fish products; spoilage in canned fish. Fish products – fish flour, fish sauce, dried fish meal, fish protein concentrates and fish oil.	12
Unit V	Processing of Meat and its Products Microscopic structure of meat tissue; slaughtering operation for lamb and poultry-post – mortem changes of meat, tenderization and ageing of meat. Curing, smoking and sausages of meat.	12

Text Books:

1. Shakuntala Manay, N. and Shadaksharaswamy, M., (2008) *Foods – Facts and Principles*, 3rd Edition, New Age International (P) Limited Publishers, New Delhi, 2013.
2. Sivasankar B, (2004) *Food Preservation and Processing*, 1st Edition, Prentice – Hall of India Private Ltd., New Delhi, 2012.

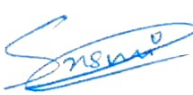
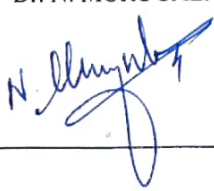
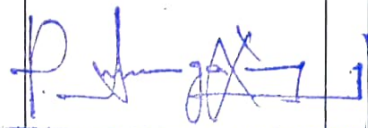
Reference Books

1. Adams, M.R. and Moss, M.O., *Food Microbiology*, (2015) New Age International (P)Ltd., New Delhi.
2. Sukumar De, (2001), *Outlines of Dairy Technology*, Oxford Publisher.
3. Srilakshmi, B., 2001, *Food Science*, New Age International Pvt. Ltd., ND.

Mapping of Outcomes

CO	PO1	PO2	PO3	PO4
CO1	S	M	S	L
CO2	S	S	S	S
CO3	M	S	S	S
CO4	S	S	S	S

S - Strong; M-Medium; L-Low.

Course Designed by	Verified by HOD	Approved by
SUSMI SATHEESHKUMAR 	Dr. N. MURUGALATHA 	

Co-ordinator
Curriculum Development Cell
Hindusthan College of Arts & Science
Coimbatore-641 020

BACHELOR OF FOOD PROCESSING TECHNOLOGY AND MANAGEMENT

Programme Code:	FPU	Programme Title: Bachelor Science of Food Processing Technology and Management		
Course Code:	20FPU15	CourseTitle	Batch:	2020-2021 and Onwards
		PRACTICAL VII - PROCESSING OF FOODS OF ANIMAL ORIGIN AND FERMENTATION TECHNOLOGY		IV
Hrs/Week:	4		Credits:	2

Course Objectives

To enable the students to

- study the cooking techniques of meat and poultry.
- gain knowledge on value added products with animal foods
- understand preparation of recipes
- familiarize with the preservation and quality standards.

Course Outcomes (CO)

K1	CO1	Listing various cooking methods of meat and poultry.
K2	CO2	Demonstrating on value added products with animal foods.
K3	CO3	Applying recipe preparation.
K4	CO4	Analyzing various quality parameters.

Code No	Subject	Semester No
20FPU15	PRACTICAL VII- PROCESSING OF FOODS OF ANIMAL ORIGIN AND FERMENTATION TECHNOLOGY	IV
S.No	LIST OF EXPERIMENTS	No of Hrs
1	Cooking of meat by dry heat method.	6
2	Cooking of meat by moist heat method.	5
3	Preparation of evaporated milk.	5
4	Demonstration of different cuts of meat.	5
5	Determining the quality parameters of egg	5
6	Determining the boiling time of egg	5
7	Preparation of poached egg with acid and alkali.	5
8	Various recipes with egg and meat	6
9	Preparation of value-added products with egg shell	6

Text books:

1. Shakuntala Manay, N. and Shadaksharaswamy, M., (2008) *Foods – Facts and Principles*, 3rd Edition, New Age International (P) Limited Publishers, New Delhi, 2013.
2. Srilakshmi, B., 2001, *Food Science*, New Age International Pvt. Ltd., ND


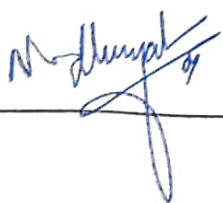
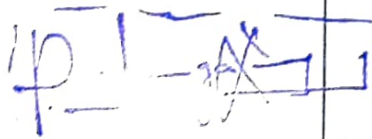
Reference Books

1. Adams, M.R. and Moss, M.O., *Food Microbiology*, (2015) New Age International (P)Ltd., New Delhi.
2. Sukumar De, (2001), *Outlines of Dairy Technology*, Oxford Publisher

Mapping of Outcomes

CO	PO	PO1	PO2	PO3	PO4
CO1	S	S	S	S	S
CO2	M	S	S	S	M
CO3	S	S	S	S	M
CO4	L	M	M	M	S

S - Strong; M-Medium; L-Low

Course Designed by	Verified by HOD	Approved by
DEEPIKA.S 	Dr. N. MURUGALATHA 	

Co-ordinator
Curriculum Development Cell
Hindusthan College of Arts & Science
Coimbatore-641 028

BACHELOR OF FOOD PROCESSING TECHNOLOGY AND MANAGEMENT

Programme Code:	FPU	Programme Title: Bachelor of Food processing technology and Management		
Course Code:	20FPU16	CourseTitle	Batch:	2020-2021 and Onwards
		ALLIED –NUTRITION AND DIETETICS		IV
Hrs/Week:	4		Credits:	4

Course Objectives

To enable the students to

- gain knowledge about nutrition and malnutrition
- determine the energy values of foods
- learn the sources and functions of vitamins and minerals
- know the importance of water and electrolyte balance in the body

Course Outcomes (CO)

K1, K2, K3, K4	CO1	Recalling the importance of diet; applying a balanced diet and identifying basic terms in food and nutrition.
K1, K2, K3, K4	CO2	Recognizing the importance of nutrients; classifying different nutrients and analyzing the functions of nutrients.
K1, K2, K3, K4	CO3	Defining the function of vitamins and minerals and focusing on sources of nutrients.
K1, K2, K3, K4	CO4	Identifying different cooking methods; applying basic principles of meal planning and analyzing therapeutic diet for various disorder.

Code No	Subject	Semester No
20FPU16	ALLIED –NUTRITION AND DIETETICS	IV
Unit No	Topics	Hours
Unit I	<p>Introduction to Food and Nutrition Basic terms used in study of food and nutrition, BMI and nutritional status, understanding relationship between food, nutrition and health.</p> <p>Balanced Diet Functions of food-physiological, psychological and social, concept of balanced diet, food groups, food pyramid and my plate, nutritional requirement for adult.</p>	10
Unit II	<p>Nutrients Classification, functions, digestion and absorption, dietary sources, RDA, of the following in brief: carbohydrates, lipids and proteins</p>	10
Unit III	<p>Vitamins and Minerals Sources, function and deficiency : Fat soluble vitamins-A, D, E and K. Water soluble vitamins – thiamin, riboflavin, niacin, pyridoxine, folate, vitamin B12 and vitamin C. Minerals – calcium, iron, iodine, fluorine, copper and zinc</p>	10
Unit IV	<p>Concepts of Meal Planning Factors affecting meal planning, understanding specific considerations for planning meal for different groups of people</p> <p>Methods of Cooking Dry, moist, frying and microwave cooking, Advantages, disadvantages and the effect of various methods of cooking on foods</p>	08
Unit V	<p>Diet Therapy and Therapeutic Diets Diet Therapy - Objectives of diet therapy. Principles and preparation and counselling of diet therapy. Routine Hospital diet– liquid, semi liquid, light, soft diet, bland diet and regular diet. Therapeutic Diets - Therapeutic diets for the following disorders- underweight - definition, etiology, treatment obesity - definition, etiology, treatment. Diseases of the gastro intestinal tract- ulcer, constipation and diarrhoea.</p>	10

Text Books:

1. Sukhmeet Suri, Anita Malhotra, 2013, Food Science Nutrition and Safety, Pearson publisher.
2. Srilakshmi, 2007, Food Science, 7th Edition. New Age International Ltd.




Reference Book

1. Shubhangini A. Joshi, 2017, Nutrition and Dietetics, McGraw Hill Education Publisher

Mapping of Outcomes

CO	PO	PO1	PO2	PO3	PO4
CO1		L	M	L	M
CO2		M	M	S	S
CO3		M	S	S	S
CO4		S	L	S	S

S - Strong; M-Medium; L-Low.

Course Designed by	Verified by HOD	Approved by
SUSMI SATHEESHKUMAR 	Dr. N. MURUGALATHA 	

Co-ordinator
Curriculum Development Cell
Hindusthan College of Arts & Science

Coimbatore-641 029

BACHELOR OF FOOD PROCESSING TECHNOLOGY AND MANAGEMENT

Programme Code:	FPU	Programme Title: Bachelor Science of Food Processing Technology and Management	
Course Code:	20FPU17	CourseTitle	Batch: 2020-2021 and Onwards
		ALLIED PRACTICAL VIII – NUTRITION AND DIETETICS	IV
Hrs/Week:	3	Credits:	2

Course Objectives

To enable the students to

- gain knowledge on the energy value of foods and the energy requirements of individual
- understand about the nutritional composition of food.
- Prepare recipes for different disease conditions
- Analyze various value-added snacks

Course Outcomes (CO)

K1	CO1	Examining various nutrient content in foods.
K2	CO2	Relating different nutritional parameters.
K3	CO3	Applying recipe preparation of healthy snacks.
K4	CO4	Analyzing various value added snacks.

Code No	Subject	Semester No
20FPU17	'ALLIED PRACTICAL VIII - NUTRITION AND DIETETICS	IV
S.No	LIST OF EXPERIMENTS	No of Hrs
1	Identification of food sources for various nutrients using food composition tables.	4
2	Plan, prepare and serve diet for Ulcer.	4
3	Plan, prepare and serve diet for Underweight.	4
4	Plan, prepare and serve diet for Obesity.	4
5	Planning of meals for adults of different activity levels for various income groups.	4
6	Planning of healthy snacks for different age and income groups.	4
7	Preparation of healthy snacks using various methods of cooking.	4
8	Estimation of BMI and other nutritional status parameters.	4
9	Preparation of value-added nutritional snacks.	4

Text book:


1. Srilakshmi, 2007, *Food Science, 7th Edition. New Age International Ltd.*

2. Shubhangini A. Joshi, 2017, *Nutrition and Dietetics, McGraw Hill Education Publisher*

Mapping of Outcomes

CO	PO	PO1	PO2	PO3	PO4
CO1		S	S	S	M
CO2		M	L	M	S
CO3		S	M	S	M
CO4		M	S	S	S

S - Strong; M-Medium; L-Low.

Course Designed by	Verified by HOD	Approved by
SUSMI SATHEESHKUMAR 	Dr. N. MURUGALATHA 