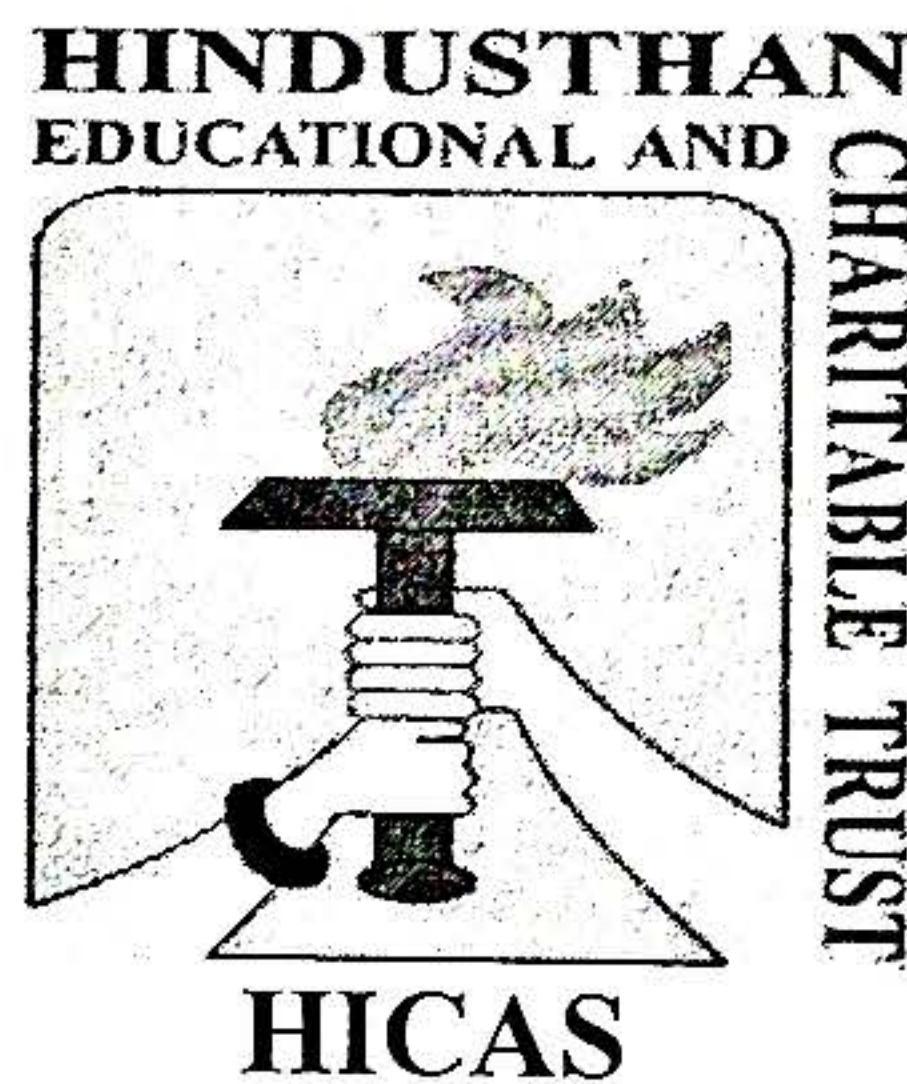


**LEARNING OUTCOMES – BASED  
CURRICULUM FRAMEWORK (LOCF)**

**In the**

**UNDER GRADUATE PROGRAMME  
BACHELOR OF SCIENCE IN  
FOOD PROCESSING TECHNOLOGY & MANAGEMENT**

**FOR THE STUDENTS ADMITTED FROM THE  
ACADEMIC YEAR 2022-2023 AND ONWARDS**



**HINDUSTHAN COLLEGE OF ARTS & SCIENCE (AUTONOMOUS)**

**(Affiliated to Bharathiar University and Accredited by NAAC)**

**COIMBATORE-641028**

**TAMILNADU, INDIA**

**Phone: 0422- 4440555**

**Website: [www.hindusthan.net/hicas/](http://www.hindusthan.net/hicas/)**

## **PREAMBLE**

Food Processing Technology and Management is a science branch that deals with the techniques involved in production, processing, preservation, packaging, labeling, quality management, and distribution of food products. The food processing technology is the set of methods and techniques used to transform raw ingredients into food or to transform food into other forms of food products for consumption by humans or animals either in the home or by the food processing industry. The duration of the course is three years. In the course of the study, candidates are provided a solid scientific foundation in chemistry, microbiology, nutrition, dietetics and the physical sciences together with knowledge of the processing and formulation of agricultural raw materials into safe and nutritious food products. Students have wide scope in obtaining jobs at food processing industries, research laboratories, hotels, soft drink factories, quality control, rice mills, manufacturing industries and distilleries.

## **VISION**

To become a centre of academic excellence with highly qualified, knowledgeable, competent food technologist. To empower students as responsible citizens who can work for the progress of the society.

## **MISSION**

To incorporate outcome-based curriculum by practicing innovative teaching methodologies both in theory and practical.

To build self-confidence, values and optimistic thinking among the students.

## **PROGRAMME EDUCATIONAL OBJECTIVES (PEO)**

**PEO1:** To make students knowledgeable about the various basic concepts in a wide-ranging context which involve the use of knowledge and skills of Food Processing Technology and Management.

**PEO 2:** To prepare graduates who will apply the technical knowledge and know how to solve the problems related to food processing and preservation for the benefit of the society.

**PE O3:** To prepare students to equip quickly to new work environments, assimilate new information and problem solving in various areas for rural development in processing and food industries.

**PEO 4:** To inculcate innovative ideas and project management skills in order to make them capable to grow as an entrepreneur.

**PE O5:** To make students competent to pursue careers in the field of food processing, quality control, product development and techno-marketing.

**PROGRAMME OUTCOMES (PO's)**

**FOR LAB ORIENTED SCIENCE COURSES**

**PO 1:** Develop knowledge and understand the Food Processing Technology and Management concepts as applicable to diverse areas such as industrial, environment, agriculture, food and others.

**PO 2:** Identify, formulate, analyze and solve complex problems reaching food industries.

**PO3:** Examine the impact of professional science and technological solutions in societal and environmental contexts and for sustainable development.

**PO4:** Develop the skill to use important/emerging techniques/databases, to retrieve data, and compare the data of the emerging techniques in food development with an interdisciplinary approach.

**PO5:** Develop the ability to operate objectively as an individual and as a member in diverse teams and they will be able to communicate effectively on complex science and technological activities with society at large and able to write effective reports and documentation.

**PO 6:** Develop a broader perspective of the discipline to enable him/ her to identify challenging societal problems and plan his/ her professional career to develop innovative solutions for such problems and recognize the need for life-long learning in the broadest context of technological change.

**PO 7:** Identify and analyze problems, articulate with peers/ team members/ other stakeholders, and undertake remedial measures to overcome the issues.

## **PROGRAMME SPECIFIC OUTCOMES (PSO)**

**PSO 1:** Apply the knowledge of food chemistry, food preservation, food processing and food packaging for the effective utilization of agricultural commodities to develop healthy and nutritious foods.

**PSO 2:** Explain the basic concepts of various unit operations and unit processes in food process technology and management.

**PSO 3:** Devise research strategies for empowering and promoting healthy living in the community.

**PSO 4:** Apply the knowledge of food engineering and technology principles from the various aspects of food technology and related disciplines to solve practical and real-world problems.

**PSO 5:** Design economically feasible equipment for the modernization of traditional food processing methods.

**HINDUSTHAN COLLEGE OF ARTS & SCIENCE (AUTONOMOUS)**  
**COIMBATORE-641028**  
**SCHEME OF EXAMINATIONS-CBCS & LOCF PATTERN**  
*(For The Students Admitted From The Academic Year 2022-2023 And Onwards)*

**UG PROGRAMME**

**Programme: B.Sc      Branch: FOOD PROCESSING TECHNOLOGY & MANAGEMENT**

Part	Course Code	Course Type	Course Title	Credit Points	Lecture Hours/Week		Exam Duration (hour)	MAX.MARKS		
					Theory	Practical		I.E.	E.E	Total
<b>Semester-I</b>										
I	22LAT01 22LAH01 22LAM01 22LAF01	MIL	Tamil-I/Hindi-I/Malayalam-I/French-I	4	6	-	3	50	50	100
II	22ENG01	AECC	English-I	4	6	-	3	50	50	100
III	22FPU01	DSC	<b>Core I</b> Basics of Food Science	5	5	-	3	50	50	100
III	22FPU02	DSC	<b>Core II-Practical I</b> Basics of Food Science	3	-	5	3	50	50	100
III	22FPU03	GE	<b>Allied I</b> Food Chemistry	4	4	-	3	50	50	100
III	22FPU04	GE	<b>Allied II- Practical II</b> Food Chemistry	2	-	3	3	50	50	100
IV	22GSU01	AECC	<b>Skill Based Subject</b> Environmental Studies	1	2	-	2	50	-	50
IV	22FPUV01	SEC	VAC-I/Life Skills-I@/ Communicative English	1*	2	-	2	50*	-	50**
IV	22FPUE01	AEE	Open Elective-I	2	3	-	3	100	-	100
IV	-	AECC	Extension Activities NSS/NCC/SPORTS/YR C/SIS/SA	Assessment will be in the Fourth Semester						
IV	-	SEC	SDR-Student Development Report	Assessment will be in the Fifth Semester						
<b>Total</b>				<b>25</b>	<b>28</b>	<b>8</b>		<b>450</b>	<b>300</b>	<b>750</b>
<b>Semester-II</b>										
I	22LAT02 22LAH02 22LAM02 22LAF02	MIL	Tamil-II/ Hindi-II/ Malayalam-II/ French-II	4	6	-	3	50	50	100
II	22ENG02	AECC	English-II	4	6	-	3	50	50	100

III	22FPU05	DSC	<b>Core III</b> Food Processing Technology-I	5	5	-	3	50	50	100
III	22FPU06	DSC	<b>Core IV</b> Bakery and Confectionary	4	4	-	3	50	50	100
III	22FPU07	DSC	<b>Core V-Practical III</b> Bakery and Confectionary	3	-	5	3	50	50	100
III	22FPU08	GE	<b>Allied III</b> Food Microbiology	3	3	-	3	50	50	100
III	22FPU09	GE	<b>Allied IV- Practical- IV</b> Food Microbiology	2	-	3	3	50	50	100
IV	22FPUV02	SEC	VAC-II/Life Skills- II@/Language	1*	2	-	2	50*	-	50**
III	22FPU10	SEC	Internship/Industrial Visit/ Mini Project	1	-	-	-	100	-	100
IV	22FPUJ01	SEC	<b>Aptitude/ Placement Training</b>	Grade*	2	-	3	50*	-	50**
<b>Total</b>				<b>26</b>	<b>28</b>	<b>8</b>		<b>450</b>	<b>350</b>	<b>800</b>
<b>Semester-III</b>										
III	22FPU11	DSC	<b>Core VI</b> Food Preservation Technology and Fermentation	5	5	-	3	50	50	100
III	22FPU12	DSC	<b>Core VII-Practical-V</b> Food Preservation Technology and Fermentation	3	-	4	3	50	50	100
III	22FPU13	DSC	<b>Core VIII</b> Principles of Nutrition	4	5	-	3	50	50	100
III	22FPU14	DSC	<b>Core IX-Practical-VI</b> Principles of Nutrition	2	-	5	3	50	50	100
III	22FPU15	DSE	<b>ELECTIVE I/ DSE I</b>	4	5	-	3	50	50	100
III	22FPU16	DSE	<b>ELECTIVE II/ DSE II</b>	4	4	-		50	50	100
IV	22FPUJ02	AEE	Open Elective-II	2	3	-	3	100	-	100
IV	22GSU02	AECC	<b>Skill Based Subject</b> Human Rights	1	2	-	2	50		50
IV	22FPUJ02	SEC	<b>Aptitude/ Placement Training</b>	Grade*	2	-	2	50*		50**
IV	22FPUJ03	SEC	<b>Online Course</b>	-	1	-	-	-	-	-C/NC
<b>Total</b>				<b>25</b>	<b>27</b>	<b>9</b>		<b>450</b>	<b>300</b>	<b>750</b>
<b>Semester-IV</b>										
III	22FPU17	DSC	<b>Core X-</b> Food Processing Technology-II	5	5	-	3	50	50	100
III	22FPU18	DSC	<b>Core XI- Dairy Technology</b>	5	5	-	3	50	50	100

III	22FPU19	DSC	Core XII Food Product Development	4	5	-	3	50	50	100
III	22FPU20	DSC	Core XIII- Practical VII Food Processing Technology-II and Dairy Technology	3	-	5	3	50	50	100
III	22FPU21	GE	Allied V Computer Application in Food Processing Technology and Management	4	5	-	3	50	50	100
III	22FPU22	GE	Allied VI- Practical VIII Computer Application in Food Processing Technology and Management	2	-	4	3	50	50	100
III	22FPU23	SEC	Internship/Institutional Training/Mini-Project	1	-	-	-	100	-	100
IV	22GSU03	AECC	Skill Based Subject Internet Security	1	2	-	2	50	-	50
IV	22FPUJ04	SEC	Aptitude/ Placement Training	Grad e*	2	-	2	50*	-	50**
IV	22FPUV03	ACC	VAC-III	1 *	2	-	2	50*	-	50**
IV	22FPUJ05	SEC	Online Course	-	1	-	-	-	-	-C/NC
V	22GSU04	AECC	Extension Activities NSS/NCC/SPORTS/YRC/ SIS/SA#	2	-	-	-	-	-	C/NC
<b>Total</b>				<b>27</b>	<b>27</b>	<b>9</b>		<b>450</b>	<b>300</b>	<b>750</b>
<b>Semester-V</b>										
III	22FPU24	DSC	Core XIV Food Safety and Quality Management	5	5	-	3	50	50	100
III	22FPU25	DSC	Core XV Techniques in Food Evaluation (Analysis & Sensory Evaluation)	5	6	-	3	50	50	100
III	22FPU26	DSC	Core XVI-Practical IX Techniques in Food Evaluation (Analysis & Sensory Evaluation)	3	-	5	3	50	50	100
III	22FPU27	DSC	Core XVII Food Packaging and Food Processing Equipments	5	6	-	3	50	50	100
III	22FPU28	DSC	Core XVIII—Practical X- Food Packaging and Food Processing Equipments	5	-	5	3	50	50	100
IV	22FPU03	AEE	Open Elective-III	2	3	-	3	100	-	100

IV	22GSU05	AECC	<b>Skill Based Subject</b> General Awareness	1	1		2	50	-	50
IV	22GSU06	AECC	<b>Skill Based Subject</b> Law of Ethics	1	-	-	2	50	-	50
IV	22FPUV04	ACC	VAC-IV	1*	2	-	2	50*	-	50**
IV	22FPUJ06	SEC	Aptitude/ Placement Training	Grade*	2	-	2	50*	-	50**
IV	22FPUJ07	SEC	Online Course	-	1	-	-	-	-	-C/NC
IV	22FPUJ08	SEC	SDR-Student Development Report	2*	-	-	-	-	-	-
<b>Total</b>				<b>27</b>	<b>26</b>	<b>10</b>		<b>450</b>	<b>250</b>	<b>700</b>
<b>Semester-VI</b>										
III	22FPU29	DSE	ELECTIVE III/DSE-III	4	5	-	3	50	50	100
III	22FPU30	DSE	ELECTIVE IV/DSE-IV	4	5	-	3	50	50	100
III	22FPU31	DSC	Core XIX Self-Study Course	3	-	-	3	50	50	100
III	22FPU32	SEC	Project Work/ Student Research/Paper	4	-	4	-	50	50	100
<b>Total</b>				<b>15</b>	<b>10</b>	<b>4</b>		<b>200</b>	<b>200</b>	<b>400</b>
<b>Grand Total</b>				<b>145</b> + <b>( 6 Extra Credits)</b>				<b>2450</b>	<b>1700</b>	<b>4150</b>



- Denotes Extra credits which are not added with total credits.
- \*\*denotes Extra marks which are not added with total marks.
- VAC-Value Added Course (Extra Credit Courses)
- \*Grades depends on the marks obtained
- †C-Completed/NC-Not Completed

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

- Part IV & V not included in total marks and CGPA calculation.
- I.E-Internal Exam
- E.E-External Exam
- J-Job Oriented Course
- E-Open Elective Papers

### **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% (30 marks) in EE and 50% in Total Marks

# ABSTRACT FOR SCHEME OF EXAMINATION

(For the candidates admitted during the academic year 2022.-2023 and onwards)


Part	Course	Papers	Credit	Total Credits	Marks	Total Marks
Part I	Languages/(MIL)	2	4	8	100	200
Part II	English/AECC-I	2	4	8	100	200
Part III	Core/DSC	18	3/4/5	74	100	1800
	Allied/GE	6	2/3/4	17	100	600
	Electives/DSE	4	4	16	100	400
	Project/SEC	1	4	4	100	100
	Self-Study Course/DSC	1	3	3	100	100
	Internship/ Institutional Training/Mini-Project/SEC	2	1	2	100	200
Part IV	Open Electives/AEE	3	2	6	100	300
	AECC-EVS/HR/IS/GA/LE	5	1	5	50	250
	Job Oriented Course /Value Added Course	2	1	2*	50	100**
	Skill Based/Placem ent/Aptitude SEC	4	Grade	Grade	50	200**
	Online courses/ SEC	3	C/NC	C/NC	-	-
	Life Skills/SEC	2	1	2*	50	100**
	SDR-Student Development Report	1	2	2*	-	-
Part V	Extension Activities NSS/ NCC/ Sports/YRC/ SIS /SA-AECC	1	C/NC	2	-	-
	<b>Total</b>			<b>145+ (6 Extra Credits)</b>		<b>4150 +(400**)</b>

### List of Open Elective Papers

<b>Open Electives</b>	Yoga for Human Excellence Human Health & Hygiene Indian Culture and Heritage Indian Constitution and Political System Consumer Awareness and Protection Professional Ethics and Human Values Human Rights, Women's Rights & Gender Equality Disaster Management Green Farming Corporate Relations start a Business Research Methodology and IPR General Studies for Competitive Examinations IITJAM Examination (for Science only) CUCET Examination
<b>VAC Papers</b>	Food Adulteration Flesh Food Processing Extrusion of Foods Principles of Foods Processing Nutraceuticals & Functional Foods Space and Military Foods Sports Nutrition Keto and Paleo Diet Planning Basic Human Nutrition Hygiene and Sanitation Advertising methods
<b>Courses offered by the Departments to other Programmes</b>	

## ELECTIVES

<b>List of Elective Papers/DSE</b> (Can choose anyone of the paper as electives)		
	Course Code	Title
<b>Electives / DSE-I</b>	22FPU15A	Emerging Technologies in Food Processing
	22FPU15B	Nutrition and Dietetics
	22FPU15C	Food and Beverage Management
<b>Electives/ DSE-II</b>	22FPU16A	Flavour Technology
	22FPU16B	Functional Foods and Nutraceuticals
	22FPU16C	Hospital Management
<b>Electives/ DSE-III</b>	22FPU29A	Extrusion Technology
	22FPU29B	Opportunities and Avenues in Food Processing
	22FPU29C	Digital Marketing
<b>Electives/ DSE-IV</b>	22FPU30A	Food Processing App development
	22FPU30B	Food and Nutrition
	22FPU30C	Innovation, Incubation and Start ups

  
 Syllabus Coordinator  
 (Ms. A.T. Agaladevar)

  
 Academic Council- Member Secretary

  
 BQS-Chairman / Chairperson  
 Food Processing Technology and Management  
 Hindusthan College of Arts & Science  
 (Autonomous)  
 Coimbatore - 641 028.

**PRINCIPAL**

**PRINCIPAL**

Hindusthan College of Arts & Science (Autonomous),  
 Hindusthan Gardens, Behind Nava India,  
 Coimbatore - 641 028.

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

(For the students admitted during the academic year 2022-2023 and onwards)

### 1. Internal Marks for all UG

Components	Marks
Test I	10
Test II	10
Model Exam	10
Assignment	5
Attendance*	5
Internal Assessment components **	10
<b>TOTAL</b>	<b>50</b>

### \*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

### \*\* List of components for Internal Assessment (MCQ Compulsory)

S.No	Components
1	Multiple choice questions
2	Club activities
3	Assignment
4	Seminar

(Any two components from the above list with five marks each will be calculated  
.2x5=10 marks)

### 2. a) Components for Practical I.E.

Components	Marks
Test -I	15
Test - II	15
Observation	10
Application*	10
<b>Total</b>	<b>50</b>

### b) Components for Practical E.E.

Components	Marks
Experiments/Exercise	40
Record	5
Viva	5
<b>Total</b>	<b>50</b>

### 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: a)Attendance	20	50
Report	50	50	b)Review/Work diary*	30	
Viva-voce	25	50			
<b>Total</b>	<b>100</b>	<b>100</b>	E.E** a) Evaluation	30	50
			b)Viva-voce	20	
			<b>Total</b>	<b>100</b>	<b>100</b>

\*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. Guidelines for Internet Security/Human Rights/ Law of Ethics/ Environmental Studies (Part IV)**

Components	Marks
Two Tests (each 2 hours) of 20 marks each [4 out of 7 descriptive type questions $4 \times 5 = 20$ Marks]	40
Two assignments (2 x 5)	10
<b>Total</b>	<b>50</b>

**5. Guidelines for General Awareness (Part IV)**

Components	Marks
Two Tests (each 2 hours) of 25 marks each [50 objective type questions $50 \times 1/2 = 25$ Marks]	50

**6. Guidelines for open Elective (Part IV)**

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

**7. Value Added Courses and Aptitude/Placement courses:**

Components	Marks
Two Test (each 1 hour) of 25 marks each QP is objective pattern ( $25 \times 1 = 25$ )	50
<b>Total</b>	<b>50</b>

**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 and 7 are to be treated as 100% Internal papers.
4. For item No.7, Tests conducted through online modules (Google Form/any other)
5. Item No.2: \* - Application should be from the relevant practical subject other than the Listed programmes. It must be enclosed in the practical record.

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

Reg.No:----- Q.P.CODE:  
HINDUSTHAN COLLEGE OF ARTS & 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 6 = 24 marks)**

Answer ALL Questions

ALL Questions Carry EQUAL Marks

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

**SECTION - C (2x10 = 20 marks)**

Answer any TWO Questions out of THREE Questions

ALL Questions Carry EQUAL Marks

(Q.No: 11 to 13)

**QUESTION PAPER PATTERN FOR MODEL/END SEMESTER EXAMINATION**

Reg.No:----- Q.P.CODE:  
HINDUSTHAN COLLEGE OF ARTS & 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 (5x6=30 Marks)**

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(Q.No 11 to 15 Either or type)

(One question from each Unit)

**SECTION - C (3x10=30 Marks)**

Answer any THREE Questions out of FIVE Questions

ALL Questions carry EQUAL Marks

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

## Blue Print of Question Paper for all UG Programmes

(For the academic year 2021-22, 2022-23)

**Max. Marks: 50**

### FOR CIA I, CIA II - QUESTION PATTERN

Sec	Question No	Type	No of Question	Questions to be answered	Mark per question	K-level
A	1 to 6	MCQ/ True or False/ Fill up	6	6	1 (6x1=6)	All Questions will be K1
B	7 to 10	Either or Type (a or b)	8	4	6 (4x6=24)	4 Questions will be in K2 4 Questions will be in K3
C	11 to 13	Open choice	3	2	10 (2x10=20)	1 Question will be in K3 2 Question will be in K4

### FOR MODEL/ESE - QUESTION PATTERN

**Max. Marks:70**

Sec	Question No	Type	No of Question	Questions to be answered	Mark per question	K-level
A	1 to 10	MCQ/ True or False/ Fill up	10	10	1 (10x1=10)	All Questions will be K1
B	11 to 15	Either or Type (a or b)	10	5	6 (5x6=30)	6 Questions will be in K2 4 Questions will be in K3
C	16 to 20	Open choice	5	3	10 (3x10=30)	2 Question will be in K3 3 Question will be in K4

(For the academic year 2020-21)

### FOR CIA I, CIA II - QUESTION PATTERN

**Max. Marks:50**

Sec	Question No	Type	No of Question	Questions to be answered	Mark per question	K-level
A	1 to 6	MCQ/ True or False/ Fill up	6	6	1 (6x1=6)	All Questions will be K1
B	7 to 10	Either or Type (a or b)	8	4	5 (4x5=20)	4 Questions will be in K2 4 Questions will be in K3
C	11 to 13	Either or Type (a or b)	6	3	8 (3x8=24)	3 Question will be in K3 3 Question will be in K4

### FOR MODEL/ESE - QUESTION PATTERN

**Max. Marks:70**

Sec	Question No	Type	No of Question	Questions to be answered	Mark per question	K-level
A	1 to 10	MCQ/ True or False/ Fill up	10	10	1 (10x1=10)	All Questions will be K1
B	11 to 15	Either or Type (a or b)	10	5	4 (5x4=20)	6 Questions will be in K2 4 Questions will be in K3
C	16 to 20	Either or Type (a or b)	10	5	8 (5x8=40)	5 Question will be in K3 5 Question will be in K4



## Blue Print of Question Paper

Distribution of section-wise marks with K levels for UG 2021-22, 2022-23

CIA							
Sec.	K1	K2	K3	K4	Total questions	Questions to be answered	Total marks
A -MCQ/T or F /Fill up	6				6	6	6x1=6
B - Either or type		4	4		8	4	4x6=24
C - Open choice			1	2	3	2	2x10=20
Total Marks	6	24	34	20			84
% of marks without choice	7.14	28.57	40.48	23.81			100

Model Exam							
Sec.	K1	K2	K3	K4	Total questions	Questions to be answered	Total marks
A- MCQ/T or F/ Fill up	10				10	10	10x1=10
B - Either or type		6	4		10	5	5x6=30
C - Open choice			2	3	5	3	3x10=30
Total Marks	10	36	44	30			120
% of marks without choice	8.33	30	36.67	25			100

Distribution of section-wise marks with K levels for UG (2020-21)

CIA							
Sec.	K1	K2	K3	K4	Total questions	Questions to be answered	Total marks
A MCQ/T or F/ Fill up	6				6	6	6x1=6
B - Either or type		4	4		8	4	4x5=20
C - Either or type			3	3	6	3	3x8=24
Total Marks	6	20	54	24			104
% of marks without choice	5.77	19.23	51.92	23.08			100

Model Exam							
Sec.	K1	K2	K3	K4	Total questions	Questions to be answered	Total marks
A MCQ/True or False/ Fill up	10				10	10	10x1=10
B - Either or type		6	4		10	5	5x4=20
C - Either or type			5	5	10	5	5x8=40
Total Marks	10	24	56	40			130
% of marks without choice	7.69	18.46	43.08	30.77			100

## UG Programme Regulations for the academic year 2022-2023

1. Internal marks components for the candidates admitted from the academic year 2022-2023 and onwards is as follows.

### For Theory courses

Components	Marks
Test I	10
Test II	10
Model Exam	10
Assignment	5
Attendance	5
Internal Assessment components	10
<b>TOTAL</b>	<b>50</b>

### For Practical courses

Components	Marks
Test -I	15
Test - II	15
Observation/Exercise	10
Application*	10
<b>TOTAL</b>	<b>50</b>

2. The pattern of the question paper for External Examination will be maximum of 70 marks for theory courses, the marks obtained will be converted into 50 as per the scheme.
3. Passing minimum for all UG programme is 40% in Internal and 40 % in External and the composition of total 40 marks out of 100 marks.
4. Internship / Institutional Training / Mini-Project is related to the discipline. The students can be permitted to complete the Internship / Institutional Training / Mini-Project before the end of First year (end of II semester) and before the end of the second year (end of IV semester) and submit a report.

Internship / Institutional Training	Duration: Not more than seven days
Mini project	During the course of study for not more than seven days.

5. Project work is considered as a special course involving application of knowledge in problem solving/analyzing/exploring a real-life situation. A Project work may be given in lieu of a discipline specific elective paper. Distribution of marks for major project for all UG programme will be 50:50 pattern for both Internal and External in total of 100/200 marks.
6. Two tests for fully internal subjects should be conducted during CIA-I and CIA -II by the department.
7. Retest for the failure candidates in CIA I or CIA II or Part IV or Part V or Extra credit courses should be conducted during the model examination after getting approval from the COE office. The candidates who are not able to complete the minimum pass mark in internal components even getting chance of reappearance, will be treated as arrear candidates. .
8. For the Theory cum Practical blended courses, 50:50 Internal and External pattern will be followed for theory examination and Fully internal pattern will be followed for Practical examination. For theory part, External examination will be conducted as regular pattern (max of 70 marks) and it will be converted into 25 marks.

Course	Internal Marks		External marks		Total marks (Max. marks 50)	
	Min.	Max.	Min.	Max.	Min.	Max.
Theory	10	25	10	25	20	50
Practical	20	50	-		20	50

For Practical components for Theory cum Practical courses (Fully Internal)

Components	Marks
Test I	10
Test II	10
Experiment/Excercise	20
Record	5
Viva	5
Total	50

The Internal mark 50 will be converted into 25.

9. For the candidates admitted under the Fast Track System (FTS) must register their names to their concerned department heads and get approval from the COE office at the beginning of the III semester.
10. Students who are not willing to select the Project/Research work in Semester VI, can chose the theory papers offered by their departments as per the prescribed theory pattern.
11. Self Study will be a Core Paper of the department for which the examination pattern will be as like part III courses is followed.
12. NSS / NCC/Sports/YRC / SIS / SA is mandatory for all students as per New Education Policy and the students must attend the allocated hours within two years and complete the programme. They will be evaluated during the end of second year (Fourth Semester) and also a certificate will be issued.
13. SDR – Student Development Report to be received by the department from the students till end of the fifth semester. (Evidences of Curricular activities and Co-curricular activities)
14. For online courses minimum of 2 certificates in any of the online platform is mandatory.
15. Open elective courses:  
Departments can offer list of subjects which teaches moral ethics to the young community for the better future. The topics relevant to Indian ethics, Culture, Women rights, Yoga, Green farming, Indian constitution etc., as an open elective courses. These courses can be offered by the department or other department as inter department courses. Marks earned for this courses will not be included for CGPA calculations.

#### Extension Activities

NSS – National Service Scheme, as enrolled member with the College Unit.

NCC – National Credit Corps, as enrolled member with the College Unit.

SPORTS – Sports & Games Participation with College Team

YRC/RRC Youth Red Cross / Red Ribbon Club, as enrolled member with the College Unit.

Rotaract Club - Rotaract Club, as enrolled member with the College Unit.

SIS – Special Interest Subjects, as approved by the Academic Council

SA – Social Activity for not less than 50 hours with NGGO like Aram Foundation / Shanthi Social Service /Siruthuli /Kulungal Pathukappu Amaipu /Old age Home /Nagare Foundation / etc.

## Regulations of Fast Track System (FTS)

- From the academic year 2021-22, our college is offering Fast Track System (FTS) for all UG and PG programmes. In this system, we are offering two courses under the course type of Discipline Specific Elective (DSE) in the sixth semester for all UG programmes and fourth semester for all PG programmes, which are equivalent and related with National Programme on Technology Enhanced Learning/Study Webs of Active-Learning for Young Aspiring Minds (NPTEL/SWAYAM) courses.
- The students have the option of taking two subjects of the sixth semester of their programme through NPTEL/SWAYAM portal from the list given by NPTEL and can complete the online course before fifth semester and submit the received original certificates to the COE office for getting approval. If the student completes these courses before the beginning of the sixth semester (UG)/fourth semester (PG), the candidate can be considered and exempted to write the examination from the assigned DSE courses in the sixth semester/fourth semester. They should complete only the self study course and project work during the VI/IV semester as assigned in the scheme. The candidate who completes the online courses and submits the successful course completion credentials, the credit transfer will be considered as per our Scheme of Examination for qualifying the degree. The minimum duration of the registered online course must be 12 weeks. Course duration of less than 12 weeks will not be considered.
- For all PG programmes, the candidates who were admitted during the academic year 2021-2022 under the Fast track system, for the self study course, the internal mark component will be as follows. For others regular internal pattern follows.

TEST	Max. Marks	Mode
CIA I	50 (50x1=50)	Online objective type
Model Exam.	50 (50x1=50)	Online objective type

Out of these two tests, the total marks will be converted into 40 marks as Internal.

- For all UG programmes, the candidates who were admitted during the academic year 2021-2022 under the Fast track system, for the self study course, the internal mark component will be as follows. For others regular internal pattern follows.

TEST	Max. Marks	Mode
CIA I	50 (50x1=50)	Online objective type
CIA II	50 (50x1=50)	Online objective type
Model Exam.	50 (50x1=50)	Online objective type

Out of three tests, the total mark will be converted into 30 marks as Internal.

- For the students admitted in Fast Track System, must enroll their names to the concerned department heads and get approval from the COE office at the beginning of III semester for all UG Programmes and at the beginning of II semester for all PG programmes.
- The students who cleared and got certified for online courses under the fast track system, the grade obtained will be converted into average marks of range. The received certificates must be submitted to the COE office for approval of the Controller and the Principal. The FTS courses will be treated as fully external.

DEPARTMENT OF FOOD PROCESSING TECHNOLOGY & MANAGEMENT				CLASS: I B. Sc				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours /Week	CIA	Ext	Total
I	DSC	22FPU01	Core I Basics of Food Science	5	5	50	50	100

Nature of Course		
Knowledge and Skill Oriented	Employability Oriented	✓
	Entrepreneurship Oriented	
	Skill Development	

### Course Objectives

To enable the students to:

- Learn the basic concepts of food science.
- Acquire knowledge on 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.

Unit	Course Contents	Hours	K Level
I	<b>Introduction to Food:</b> <b>Definition, Importance of food-</b> Food Group: Basic 4, 5 and 7 food groups; functional food groups, functions of foods, food pyramid, my plate. <b>Study of various cooking methods</b> –Moist Heat: Boiling, steaming, stewing and pressure cooking. Dry Heat: frying- pan frying and deep fat frying, grilling, baking and roasting.	12	Up to K4
II	<b>Cereals, Pulses, Millets, Nuts and Oil Seeds:</b> <b>Cereals</b> – Composition and structure of rice, wheat and millets. Parboiling of rice-advantages and disadvantages. Types of wheat and milling of wheat. <b>Pulses:</b> Composition and Nutritive value. Processing of Pulses- wet milling, dry milling, germination, soaking and fermentation. Storage, cooking quality. Toxic constituents of pulses. <b>Millets</b> -Composition and types of millets. <b>Nuts and Oil Seeds:</b> Types of nuts and oil seeds. Toxins in nuts and oilseeds	12	Up to K4
III	<b>Vegetables, Fruits, Fats and Oils, Beverages, Spices and Condiments.</b> <b>Vegetables and Fruits:</b> Classification, pigments, ripening of fruits, storage of vegetables and fruits. <b>Fats and oil:</b> Types of vegetable oil/ fat and animal fat. <b>Beverages:</b> Classification, of beverages. Types of fruit and vegetable beverages. <b>Spices and Condiments:</b> Functions and types of spices And condiments.	12	Up to K4

IV	<b>Milk and Milk Products</b> Milk - Composition, nutritive value and kinds of milk. <b>Milk Products</b> -Fermented products and non-fermented products. Problems in milk cookery.	12	Up to K4
V	<b>Flesh Foods and Egg.</b> <b>Meat</b> - Classification, composition and nutritive value. <b>Poultry</b> - Classification, composition and nutritive value. <b>Fish</b> - Classification, composition and nutritive value. <b>Egg</b> -Structure, composition and nutritive value and storage of eggs.	12	Up to K4

### Book for Study

B. Srilakshmi, "Food Science", 2003, New Age International, 7<sup>th</sup> Edition.

### Books for Reference

1. Potter, N. and Hotchkiss, J.H., "Food Science", 1998, CBS Publications and Distributors, Daryaganji, NewDelhi, 5<sup>th</sup> Edition.
2. Suri Malhotra, "Food Science", 2002, Nutrition and Safety.
3. Shakuntala Manay, Shadakshara Swamy. M, "Foods, Facts and Principles", 2015, New Age International Pvt Ltd Publishers, 6<sup>th</sup> Edition.
4. Harshad Kiran Kalwit Sanjeev Kumar Sharma, "Objective Food Science", 2021, Jain Brothers Publication, 10<sup>th</sup> Edition.
5. Avantina Sharma, "Textbook of Food Science & Technology", 2018, CBS publishers, 3<sup>rd</sup> Edition.

### WebResources

<<http://www.fao.org/3/t0567e/T0567E08.htm>>

<<http://ecoursesonline.iasri.res.in/mod/resource/view.php?id=147675>>

**Pedagogy:** Chalk & Talk, Exercise, Assignments & PPTs.

### Rationale for Nature of the Course

Students get introduced into different types and groups of foods available.

### Activities to be given

Seminar, Assignment, Poster Presentation

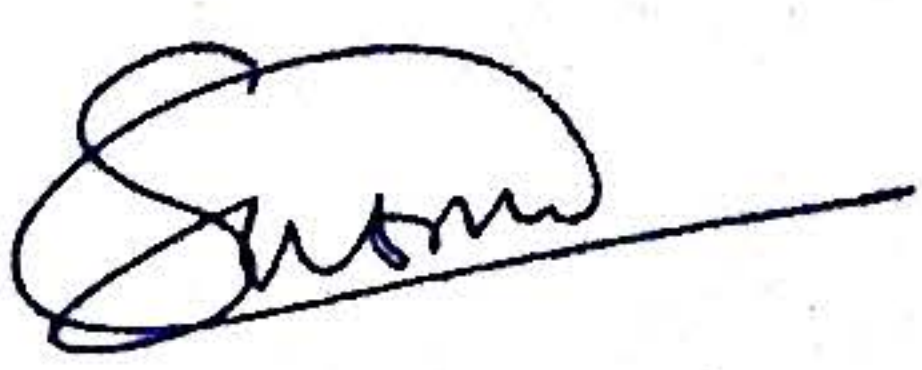
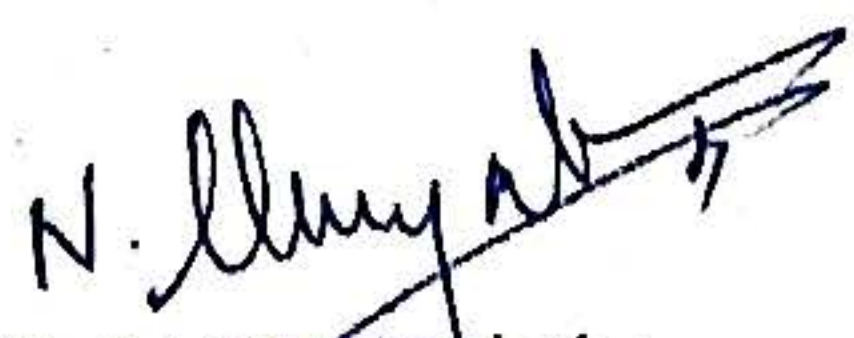

### Course Learning Outcomes:

CLOs	On Completion of the Course, the students should be able to	K-Level
CLO1	Define the functional food groups and cooking methods.	K1
CLO2	Illustrate the composition of cereals, pulses, millets, nuts and oil seeds.	Up to K3
CLO3	Identify the classification, function and types of Vegetables, Fruits, Fats and oils, beverages, Spices and Condiments.	Up to K2
CLO4	Illustrate composition of milk and milk products.	Up to K3
CLO5	Classify Flesh foods and Egg.	Up to K4

## Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

CLOs	Programme Outcomes (with Graduate Attributes)						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CLO1	2	3	3	3	3	3	2
CLO2	3	3	2	2	2	3	2
CLO3	3	3	3	3	3	3	3
CLO4	3	3	3	3	3	3	2
CLO5	3	3	2	2	2	3	3

3- Advance Application
2-IntermediateLevel
1 -Basic Level

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 Ms.Susmi Satheesh Kumar, Assistant Professor Name & Signature of the Faculty	 Dr.N.Marugalatha Name & Signature Head	 Co-ordinator Curriculum Development Cell Hindusthan College of Arts & Science Coimbatore-641 028.

**Department of Food  
 Processing Technology and Management  
 Hindusthan College of Arts & Science  
 (Autonomous)  
 Coimbatore - 641 028.**

DEPARTMENT OF FOOD PROCESSING TECHNOLOGY & MANAGEMENT				CLASS: I B.Sc				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours /Week	CIA	Ext	Total
1	DSC	22FPU02	Core II- Practical I Basics of Food Science	3	5	50	50	100

Nature of Course		
Knowledge and Skill Oriented	Employability Oriented	✓
	Entrepreneurship Oriented	
	Skill Development	✓

### Course Objectives

To enable the students to:

- Obtain knowledge of different food group.
- Acquire 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.

Unit	Course Contents	Hours	K Level
1	Food Group- Grouping of foods, discussion on nutritive value.	5	Up to K4
2	Measuring Methods-Tapping, leveling and heaping in Coarse and fine cereals.	5	Up to K4
3	Cooking Methods-Moist heat methods-boiling, simmering, steaming, and pressure cooking. Dry heat methods-roasting And baking. Microwave cooking.	6	Up to K4
4	Fat as a medium for cooking-Shallow and deep fat frying.	5	Up to K4
5	Cereals and Millets- Best cooking methods of fine and coarse cereals and millets. Recipes with cereals & millets.	6	Up to K4
6	Pulses-Cooking of soaked and un soaked pulses. Germination And fermentation of pulses. Recipes with pulses.	5	Up to K4
7	Vegetables and Fruits-Preparation of soups and salads. Recipes with vegetables and fruits.	6	Up to K4
8	Milk and Milk Products-Recipes with milk, paneer and curd.	6	Up to K4
9	Fleshy Foods-Different cuts of fish, meat and poultry-Recipe Preparations.	6	Up to K4
10	Eggs- Boiled egg, Poached egg. Recipes with egg.	5	Up to K4
11	Beverages-Preparation of tea and coffee.	5	Up to K4

### Book for Study

*Karen S. Jamesen, "Food Science Laboratory Manual", 1997, Pearson Publisher.*

### Books for Reference

*Janet D Ward . Principles of Food Science: Student Lab Manual, 2007, Goodheart- Willcox Pub.*



### Web Resources

<<http://www.fao.org/3/t0567e/T0567E08.htm>>

<<http://ecoursesonline.iasri.res.in/mod/resource/view.php?id=147675>>

**Pedagogy:** Hands on training

### Rationale for Nature of the Course

Students can able to know the processing of various plant origins using different techniques.

### Activities to be given

Seminar, Assignment, Poster

### Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K-Level
CLO1	Define different food groups, their nutritive value and role in day's Diet.	K1
CLO2	Experimenton different methods of cooking.	Up to K4
CLO3	Plan and prepare recipes with different ingredients.	Up to K4
CLO4	Estimate nutritive value to food selection.	Up to K4
CLO5	Plan and prepare energy and stress free drinks.	Up to K4

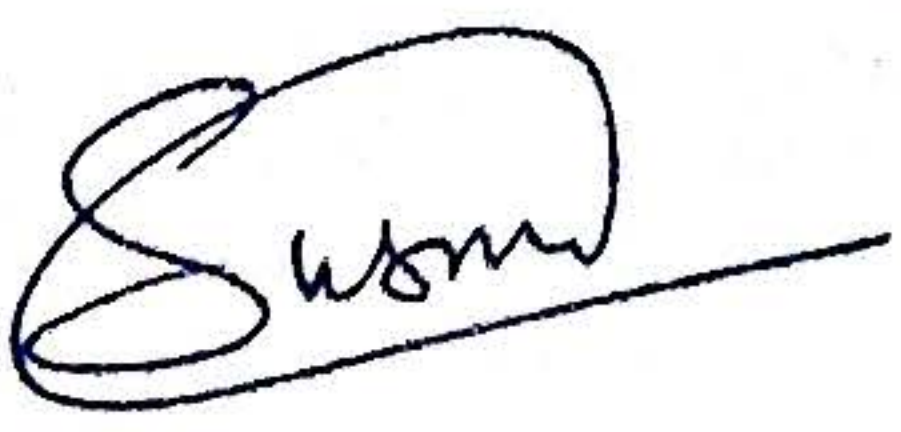


### Mapping of Course Learning Outcomes (CLOs)with Programme Outcomes (POs)

CLOs	Programme Outcomes (with Graduate Attributes)						
	PO1	PO2	PO3	PO4	PO5	PO6	PO 7
CLO1	3	3	3	3	3	3	2
CLO2	3	3	3	3	3	2	2
CLO3	3	3	3	2	2	3	3
CLO4	3	3	2	3	3	3	2
CLO5	3	3	2	3	3	3	3

3- Advance Application

2-IntermediateLevel

1 -Basic Level

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 Ms.Susmi Satheesh Kumar, Assistant Professor Name & Signature of theFaculty	 Dr.N.Marigalatha Head Name & Signature	 Curriculum Development Cell Hindusthan College of Arts & Science, Coimbatore-641 028.

Department of Food  
Processing Technology and Management  
Hindusthan College of Arts & Science  
(Autonomous)  
Coimbatore - 641 028.

<b>DEPARTMENT OF FOOD PROCESSING TECHNOLOGY &amp; MANAGEMENT</b>				<b>CLASS:I B. Sc</b>				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours /Week	CIA	Ext	Total
I	GE	22FPU03	<b>Allied I Food Chemistry</b>	4	4	50	50	100

<b>Nature of Course</b>		
Knowledge and Skill Oriented	Employability Oriented	✓
	Entrepreneurship Oriented	
	Skill Development	

### Course Objectives

To enable the students to:

- Understand the types and physic chemical 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.
- Role of non-nutritive substances in food processing.

Unit	Course Contents	Hours	K Level
I	<b>Physico Chemical Changes in Foods</b> Definition of water in food, structure of water and ice. Types of water in foods and sorption phenomenon. Water activity in foods. <b>Colloids and Emulsion</b> Colloids systems in food, types and properties. Emulsion– Types, properties, emulsifying agents, natural and synthetic emulsifiers.	09	Up to K4
II	<b>Chemistry of Carbohydrates</b> Classification-Components and characteristics of food starches, swelling of starch granules. Gel formation-factors affecting gelatinization, retrogradation, syneresis. Stages of sugar cookery, crystal formation and its factors affecting. Action of acid, alkali, enzymes and non enzymatic browning	09	Up to K4
III	<b>Chemistry of Proteins</b> Structural properties of proteins-Amphoterism and denaturation. Functional properties of proteins - organoleptic, solubility, viscosity, binding, gelatin/ texturization, emulsification, foaming, gluten formation. Action of heat, Acid and alkali on vegetable and animal proteins -egg, milk, meat and fish.	10	Up to K4

	<b>Enzymes</b> Enzymes in foods-Proteolytic enzymes, oxidases, lipases, applications.		
IV	<b>Chemistry of Lipids</b> 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 inter esterification. Fat mimetics.	10	Up to K4
V	<b>Chemistry of Flavours and Pigments</b> Pectins, phenolic components, vegetable gums, volatile compounds. Active principles from plants Food additives-Definition, types of food additives. Flavours-Definition, types and chemical structures. Pigments-water and fat soluble pigments (chlorophyll, carotenoids, anthocyanins and anthoxanthins, lycopene, betalain). Action of heat, acid and alkali on vegetable pigments.	10	Up to K4

#### Book for Study

N. Shakunthala Manay and M. Shadaksharamasamy. "Foods: Facts and Principles", 2001, New Age International (P) Publishers, New Delhi, 2<sup>nd</sup> Edition.

#### Books for Reference

1. B.Srilakshmi, "Food Science", 2003, New Age International (P) Publishers, New Delhi, 7<sup>th</sup> Edition.
2. John MdeMan, "Principles of Food Chemistry", 1999, Springer New York Heidelberg Dordrecht, London, ISBN 9781461463900 (eBook), 3<sup>rd</sup> Edition.
3. Potter, N. and Hotchkiss, J.H. "Food Science", Fifth Edition, 1998, CBS Publications and Distributors, Daryaganji, New Delhi.
4. B.Sivasankar, "Food Processing and Preservation", 2018, PHI Learning Pvt.Ltd., Delhi, 13<sup>th</sup> Edition.
5. H.-D.Belitz, W.Grosch, P.Schieberle, "Food Chemistry", 2009, Springer-Verlag Berlin Heidelberg, Germany, ISBN978-3-540-69933-0.

#### Web Resources

1. <https://pdfcoffee.com/food-processing-and-preservation-4-pdf-free.html>
2. <http://www.food-info.net/uk/colour/enzymaticbrowning.htm>

#### Pedagogy

Lecturing, Power Point Projection through LCD, Assignment, Discussion and Activity.

### Rationale for Nature of the Course

Students can able to infer the chemical changes that occur during processing of food products in each food groups.

### Activities to be given

Seminar, Assignment, Poster

### Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K -Level
CLO1	Define the physic-chemical changes in food.	K1
CLO2	Relate the interaction of food and its effects on acid, alkali and heat.	Up to K3
CLO3	Infer structural and functional changes of Proteins.	Up to K2
CLO4	Determine chemical and physical changes of Lipids.	Up to K3
CLO5	Evaluate the role of non nutritive components in foods.	Up to K4




### Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

CLOs	Programme Outcomes (with Graduate Attributes)						
	PO1	PO2	PO3	PO4	PO5	PO6	PO 7
CLO1	3	3	3	3	3	3	2
CLO2	3	3	2	2	2	3	2
CLO3	3	3	3	3	3	3	3
CLO4	3	2	2	3	2	3	2
CLO5	3	3	3	2	3	3	3

3- Advance Application

2-Intermediate Level

1 -Basic Level

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 Dr. D. Mahalakshmi, Assistant Professor Name & Signature of the Faculty	 Dr.N.Murugalatha Name & Signature <b>Head</b>	 Curriculum Development Cell Hindusthan College of Arts & Science, Coimbatore-641 028.

Department of Food  
Processing Technology and Management  
Hindusthan College of Arts & Science  
(Autonomous)  
Coimbatore - 641 028.

DEPARTMENT OF FOOD PROCESSING TECHNOLOGY & MANAGEMENT				CLASS: I B.Sc				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours /Week	CIA	Ext	Total
I	GE	22FPU04	Allied II- Practical Food Chemistry	2	3	50	50	100

Nature of Course		
Knowledge and Skill Oriented	Employability Oriented	✓
	Entrepreneurship Oriented	
	Skill Development	✓

### Course Objectives

To enable the students to:

- Understand the physico-chemical changes in food.
- Acquire knowledge on adulteration in foods.
- Learn the preparation methods of food.
- Gain knowledge on the role of enzymes in food.
- Find out the changes in food by chemical reaction.

Unit	Course Contents	Hours	K Level
1	Gelatinization of various starches, microscopic examination of starches. Stages of sugar cookery.	4	UptoK3
2	Determination of gluten content in dough making.	4	UptoK3
3	Estimation of acid value of fats and oils.	4	UptoK4
4	Estimation of saponification number of fats and oils.	3	UptoK4
5	Fat absorption ratio of shallow and deep-fried foods.	3	UptoK3
6	Preparation of Panner and setting of curds.	3	UptoK3
7	Determination of the strength of pectin in different fruits and vegetable extracts.	4	UptoK4
8	Determination of thermal in activation time of enzymes in Fruits and vegetables.	4	UptoK4
9	Effect of acid, alkali and heat on pigments.	4	UptoK4
10	Enzymatic browning and its prevention.	3	UptoK4

### Book for Study

*N. Shakunthala Manay and M. Shadaksharamasamy, "Foods: Facts and Principles", Second Edition, 2001, New Age International(P) Publishers, New Delhi.*

### Books for Reference

1. *B.Srilakshmi- "Food Science", Seventh Edition, 2003, New Age International(P) Publishers, New Delhi.*
2. *John Mde Man, "Principles of Food Chemistry"-Third Edition, 1999, Springer New York Heidelberg Dordrecht, London, ISBN 9781461463900(eBook).*
3. *Potter, N. and Hotchkiss, J.H. "Food Science", Fifth Edition, 1998, CBS Publications and Distributors, Daryaganji, New Delhi.*
4. *B.Sivasankar, "Food Processing and Preservation", Thirteenth Edition, 2018, PHI Learning Pvt. Ltd., Delhi.*

5. H.-D. Belitz, W. Grosch, P. Schieberle, "Food Chemistry", 2009, Springer-Verlag Berlin Heidelberg, Germany, ISBN 978-3-540-69933-0.

#### Web Resources

1. <https://extension.purdue.edu/4h/documents/volunteer%20resources/science%20made%20easy/brown%20apples.pdf>
2. [https://old.fssai.gov.in/Portals/0/Pdf/Draft\\_Manuals/OILS\\_AND\\_FAT.pdf](https://old.fssai.gov.in/Portals/0/Pdf/Draft_Manuals/OILS_AND_FAT.pdf)

#### Pedagogy:

Hands on Experiments.

#### Rationale for Nature of the Course

Students can able to determine the quality of the processed foods by estimating the chemical compounds.

#### Activities to be given

Seminar, Assignment, Poster

#### Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K -Level
CLO1	Identify the physico-chemical changes in foods.	K1
CLO2	Infer the knowledge acquired in food preparation.	UptoK2
CLO3	Illustrate the effect of chemical reactions in foods.	UptoK3
CLO4	Experiment the food interactions and outcomes.	UptoK4
CLO5	Distinguish different components in food.	UptoK4



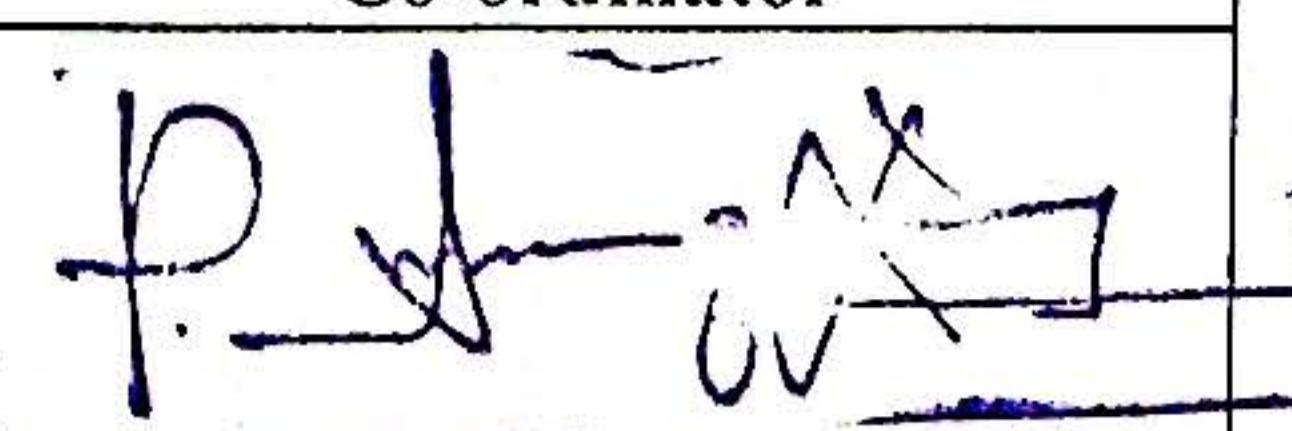
#### Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

CLOs	Programme Outcomes (with Graduate Attributes)						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CLO1	3	3	3	3	3	2	2
CLO2	3	3	2	3	3	2	2
CLO3	3	3	3	3	3	2	3
CLO4	3	2	2	3	2	1	2
CLO5	3	3	3	3	3	1	3

3- Advance Application

2-IntermediateLevel

1 -Basic Level

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 Dr. D. Mahalakshmi, Assistant Professor Name & Signature of the Faculty	 Dr. N. Murugalatha Head Name & Signature Department of Food	 Co-ordinator Curriculum Development Cell Hindusthan College of Arts & Science, Coimbatore-641 028.

Processing Technology and Management  
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 Coimbatore - 641 028.

<b>DEPARTMENT OF FOOD PROCSSING TECHNOLOGY &amp; MANAGEMENT</b>				<b>CLASS: I B.Sc</b>				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours/Week	CIA	Ext	Total
II	DSC	22FPU05	<b>Core III</b> Food Processing Technology-I	5	5	50	50	100

Nature of Course		
Knowledge and Skill Oriented	Employability Oriented	✓
	Entrepreneurship Oriented	✓
	Skill Development	✓

### Course Objectives

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.

Unit	Course Contents	Hours	K Level
I	<b>Cereals, Millets and Minor Millets Paddy Processing-</b> Composition. Curing of paddy, parboiling process. <b>Rice Milling-</b> Rice milling, Engelberg huller mills. Production of flattened rice and puffed rice from paddy. <b>Wheat Milling-</b> Wheat milling process. Products of wheat. <b>Millet Milling-</b> Processing and milling of pearl millet, sorghum and finger millet. <b>Minor Millets-</b> Processing and milling of proso millet, foxtail millet and little millet.	12	Up to K4
II	<b>Pulses, Nuts and Oil Seeds</b> <b>Milling of Pulses-</b> Varieties – Dry milling and wet milling process of pulses. Toxic constituents in pulses. Processed products by germination, fermentation, parching and puffing. <b>Nuts and Oil seeds Processing-</b> Refining and processing of oilseeds- groundnut, coconut, mustard and vegetable oil. Soybean products- Soy milk, tofu and texturized vegetable protein. Plasticity, hydrogenation, winterization, shortening fat.	12	Up to K4

III	<b>Fruits and Vegetables</b> <b>Vegetables-</b> Minimal Processing- Preliminary Preparation, changes during cooking. loss of nutrients during cooking and effect of cooking on pigments. <b>Fruits-</b> Processed products of fruits-Jams, jelly, marmalade, fruit squash, raisins, anardana and tutti frutti (flow chart) RTS, JUICES	12	Up to K4
IV	<b>Plantation and Medicinal Plants</b> Introduction and Processing of different types of tea, coffee. <b>Spices -</b> Specific spices, herbs and Condiments.	12	Up to K4
V	<b>Processing of Extruded and Fortified Foods</b> <b>Extruded Foods-</b> Extrusion of rice, wheat, millets and pulses-any two products/recipes. <b>Fortified Foods-</b> Fortification of rice, wheat ( breakfastcereals), salt, milk, oil and fat.	12	Up to K4

#### Book for Study

Subbalakshmi G. Udipi SA, "Food Processing and Preservation", New Age International Publishers, 2007, Delhi.

#### Books for Reference

1. B Srilakshmi, "Food Science", NewAgeInternational, 2003, 7th edition.
2. John MdeMan, "Principles of Food Chemistry", 3rd edition, 1999, Springer, New York
3. Heidelberg Dordrecht London ISBN 9781461463900 (eBook). 1999.
4. Potter, N. and Hotchkiss, J.H., "Food Science", 5th Ed., 1998, CBS Publication and Distributors, Daryaganji, New Delhi.
5. Warris D.S, "Food Processing and Preservation", Vol. 1- 2020, CBS- ISBN: 978-9389688597.

#### Web Resources

1. <http://http://www.fao.org/tempref/docrep/fao/004/y2515e/Y2515E02.pdf>
2. [http://https://www.researchgate.net/publication/279192433\\_Juice\\_Processing](http://https://www.researchgate.net/publication/279192433_Juice_Processing)

#### Pedagogy:

Lecturing, Power Point Projection through LCD, Assignment, Discussion and Activity.

#### Rationale for Nature of the Course

Students gain knowledge on different techniques used to process foods of all five food groups.



**Activities to be given**

Seminar, Assignment, Poster and Pamphlets

**Course Learning Outcomes**

CLOs	On Completion of the Course, the students should be able to	K-Level
CLO1	Describe the concepts of processing of cereals and millets.	Up to K2
CLO2	Sketch the milling process and nuts and oil seed processing.	Up to K3
CLO3	Experiment with the processing and preservation of fruits and vegetables.	Up to K3
CLO4	Illustrate processing of beverages and usage of spices and condiments.	Up to K3
CLO5	Analyze the uses of extruded and fortified foods.	Up to K4


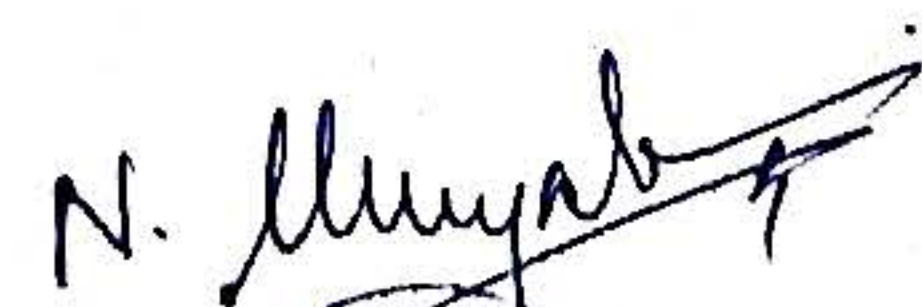
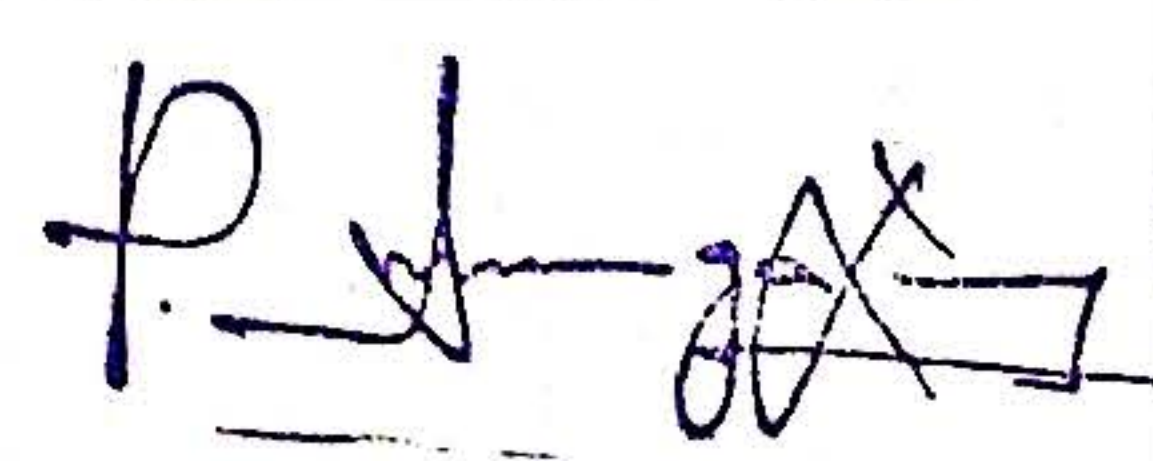
**Mapping of Course Learning Outcomes(CLOs)with Programme Outcomes(POs)**

CLOs	Programme Outcomes (with Graduate Attributes)						
	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CLO1	3	3	3	3	3	3	2
CLO2	3	3	2	2	2	3	2
CLO3	3	3	3	3	3	3	3
CLO4	3	2	2	3	2	3	2
CLO5	3	3	3	2	3	3	3

3- Advance Application

2-IntermediateLevel

1 -Basic Level

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 Mrs. Susmi Satheesh kumar, Assistant Professor  Name & Signature of the Faculty	 Dr. N. Murugalatha  Head Name & Signature Department of Food Processing Technology and Management Hindusthan College of Arts & Science (Autonomous) Coimbatore - 641 028.	  Co-ordinator Curriculum Development Cell Hindusthan College of Arts & Science, Coimbatore-641 028.

DEPARTMENT OF FOODPROCESSING TECHNOLOGY & MANAGEMENT				CLASS: I B.Sc				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours/Week	CI A	Ext	Total
II	DSC	22FPU06	Core IV Bakery and Confectionery	4	4	50	50	100

Nature of Course		
Knowledge and Skill Oriented	Employability Oriented	✓
	Entrepreneurship Oriented	✓
	Skill Development	✓

### Course Objectives

To enable the students to:

- Analyze various factors for setting up of bakery unit.
- Understand the rheological characteristics of the dough.
- Explain the role of each ingredient and processes involved in baking technology.
- Learn about manufacturing of confectionery products.
- Impart knowledge on the processing methods used in baking and confectionery industries.

Unit	Course Contents	Hours	K Level
I	<b>Wheat Processing</b> History of baking, structure and composition of the wheat kernel, steps in wheat milling, by products of wheat, enrichment of flour and bread. Varieties of wheat and types of wheat flour. Quality aspects of flour and dough	9	Up to K4
II	<b>Baking</b> Principles of baking, classification of baked foods, role of ingredients –water, yeast, sugar, shortening, milk, egg, leavening agents, spices, flavorings, food colors, flour improvers, storage of baked products, selection of packaging materials.	9	Up to K4
III	<b>Preparation and Decoration of Baked Foods</b> Cake making –Functions of ingredients, cake mixing methods. Types of cakes- Cake judging, cake faults and remedies biscuit, cookie and pastry making. Types and techniques of icing, frosting and fillings. Sensory evaluation of baked products- objective and subjective methods.	10	Up to K4
IV	<b>Confectionery</b> Processing of raw materials- Cocoa and chocolate. Making of toffee, chocolates, fruit drops, hard boiled candies (clear, hard, pulled, grained, filled), soft candies (fondant, modified fondants like toffee, fudge, marshmallows, gums, jellies, chocolates)bars, Chewing gums, special confectionery- lozenges.	10	Up to K4
V	<b>Small and Large Equipment used in Bakery Unit</b> Factors to be considered for setting up a bakery unit types of ovens – Construction and working of conventional and modern ovens. Bread making – Steps and methods, role of ingredients	10	Up to K4

variety breads, qualities of a good loaf, bread faults. spoilage of bread.		
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### Book for Study

*Yogambal Ashokkumar, "Textbook of bakery and confectionery", second edition (revised), 2012, Prentice Hall India Learning Private Limited*

### Books for Reference

1. Philip, Thangam. E, "Modern Cookery For Teaching and Trade", Ed. 6, 2010, Orient Black Swan publisher.
2. B Srilakshmi, "Food Science", NewAgeInternational, 2003, 7th edition.
3. John Kingslee, , "Bakery and Confectionery", 2019, New Age Publishers.
4. Mathuravalli, S M D, "A Textbook of Bakery and Confectionery", 2021, Jaya Publisher.
5. Jagarlamudi Lakshmi, "Bakery and Confectionery Products", 1<sup>st</sup> Edition, 2019, New India Publishing Agency- Nipa.

### Web Resources

<https://www.udemy.com/course/art-of-baking/>

### Pedagogy:

Lecturing, Power Point Projection through LCD, Assignment, Discussion and Activity.

### Rationale for Nature of the Course

Students get knowledge on the field of bakery and baking they are also equipped with knowledge on how to set up a bakery.

### Activities to be given

Seminar, Assignment, Poster

### Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K-Level
CLO1	Explain wheat processing and its by products.	Up to K3
CLO2	Illustrate the principle, classification and role of ingredients in baking.	Up to K3
CLO3	Apply the factors for setting up a bakery unit.	Up to K3
CLO4	Experiment with different methodologies for preparation and decoration of baking food.	Up to K4
CLO5	Construct different products with raw materials	Up to K3

## Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)



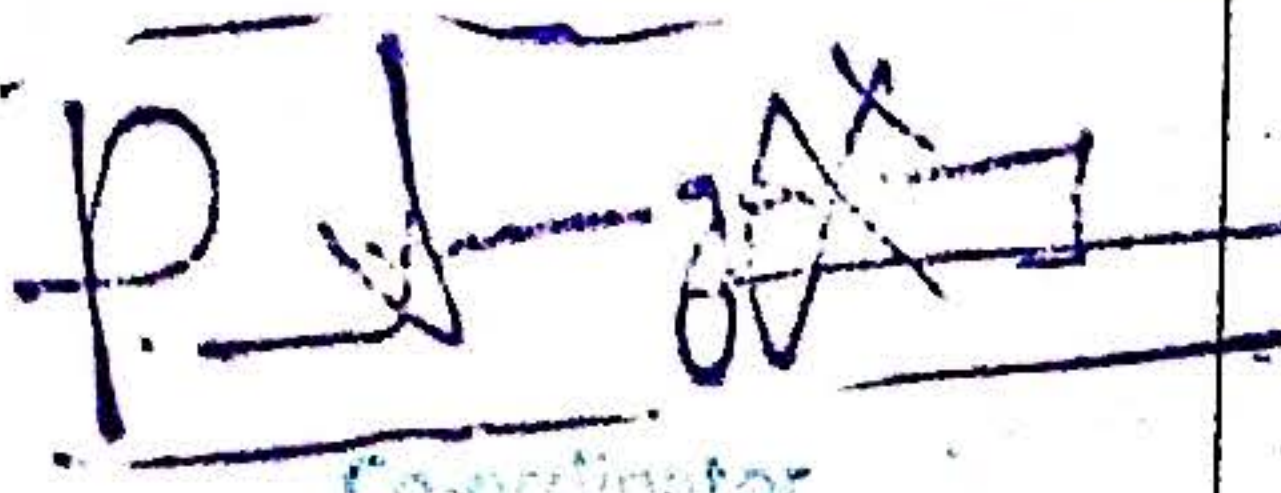
### Programme Outcomes (with Graduate Attributes)

CLOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CLO1	3	3	3	3	3	3	2
CLO2	3	3	2	2	3	3	2
CLO3	3	3	3	3	3	2	3
CLO4	3	2	2	3	2	3	2
CLO5	3	3	3	2	3	3	3

3- Advance Application

2-Intermediate Level

1 -Basic Level

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 Mrs. Susmi Satheesh kumar, Assistant Professor  Name & Signature of the Faculty	 Dr. N. Murugulatha  Head Name & Signature Department of Food	 Co-ordinator Curriculum Development Cell Hindusthan College of Arts & Science, Coimbatore-641 028.

Hindusthan Technology and Management  
 Hindusthan College of Arts & Science  
 (Autonomous)  
 Coimbatore - 641 028.

DEPARTMENT OF FOOD PROCESSING TECHNOLOGY & MANAGEMENT				CLASS: I B.Sc				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours/Week	CIA	Ext	Total
II	DSC	22FPU07	Core V- Practical III Bakery and Confectionery	3	5	50	50	100

Nature of Course		
Knowledge and Skill Oriented	Employability Oriented	✓
	Entrepreneurship Oriented	✓
	Skill Development	✓

### Course Objectives

To enable the students to:

- Impart practical knowledge by visiting bakery unit.
- Analyze the gluten content of various flour.
- Acquire knowledge on processing methods used in baking industry.
- Develop an elementary knowledge on quality assessment of baked foods.
- Make the students aware of preparation of Pastries and confectionary.

Unit	Course Contents	Hours	K Level
1	Wheat processing–Visit to a milling unit.	6	Up to K2
2	Evaluation of gluten content of flour.	6	Up to K4
3	Baking of different cookies and evaluation.	6	Up to K3
4	Preparation of pizza base, Arabic bread and sensory assessment.	6	Up to K3
5	Preparation of bread, buns and sensory assessment.	6	Up to K3
6	Preparation of cake with egg and eggless cakes with different Icing and sensory assessment.	6	Up to K3
7	Preparation of muffins and cup cakes and sensory assessment.	6	Up to K3
8	Preparation of different rusks and sensory assessment.	6	Up to K3
9	Preparation of pastries and sensory assessment.	6	Up to K3
10	Preparation of confectioneries like fudge, fondant, Marshmallows, marzipan, jujubes, soft and hard toffees.	6	Up to K3

### Book for Study

Philip, Thangam. E, "Modern Cookery For Teaching And Trade", Ed. 6 - Vol.02. 2010, Orient Black Swan Publisher.

### Books for Reference

1. Matteson Emma B, "A Laboratory Manual of Foods and Cookery", Forgotten Books.
2. John Kingslee, "Bakery and Confectionery", 2019, New Age Publishers
3. Dr. Madhvi Daniel, "Bakery & Confectionery Science", 2019, Blue Rose Publishers.

**Web Resources**

[http://eilmuniversity.co.in/downloads/Bakery\\_&\\_confectionery.pdf](http://eilmuniversity.co.in/downloads/Bakery_&_confectionery.pdf)

**Pedagogy:**

Hands on Experiments.

**Rationale for Nature of the Course**

Students will be able to set up their own bakery unit and develop the products.

**Activities to be given**

Seminar, Assignment, Poster

**Course Learning Out comes**

CLOs	On Completion of the Course, the students should be able to	K-Level
CLO1	Identify the basic ingredients which will help to prepare baked items.	Up to K2
CLO2	Experiment with methodologies to prepare different types of rusk making and pastries.	Up to K3
CLO3	Plan and Prepare various confectionaries.	Up to K4
CLO4	Examine the quality of products produced.	Up to K4
CLO5	Identify the causes of spoilage.	Up to K2

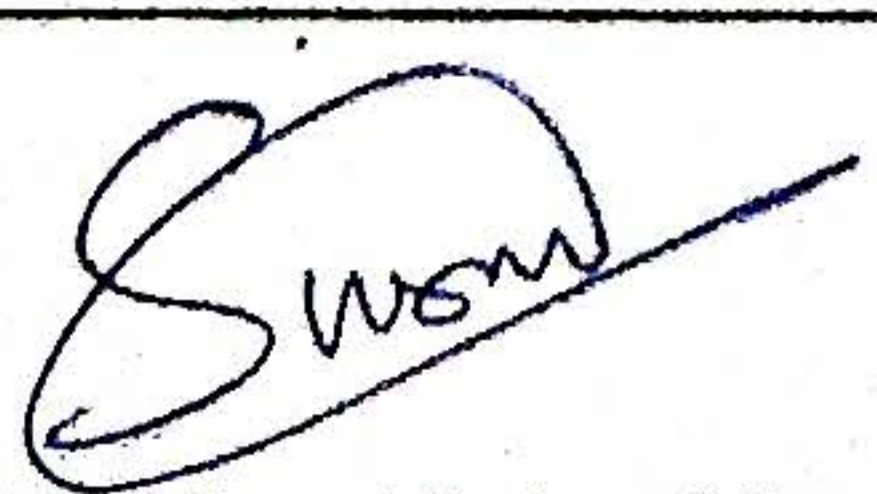

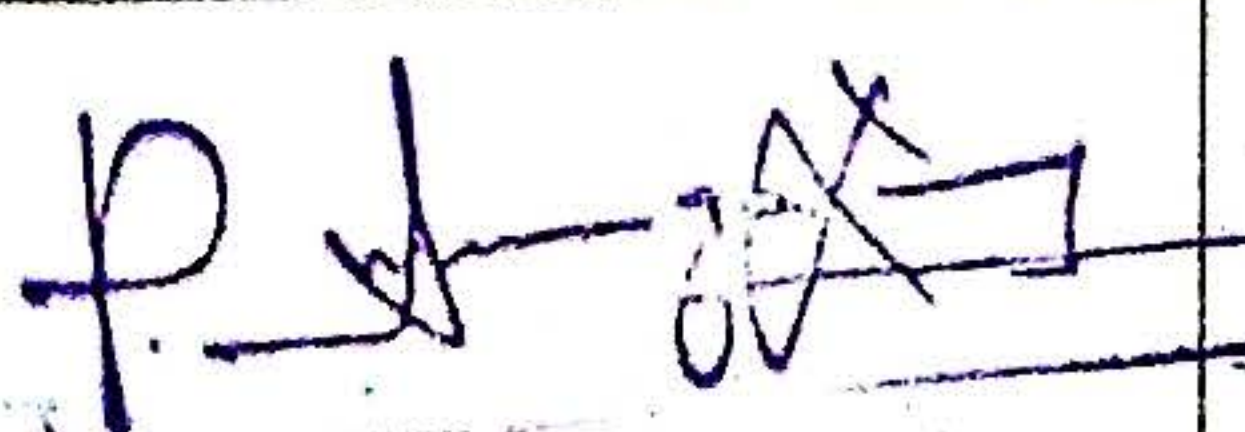
**Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes(POs)**

CLOs	Programme Outcomes (with Graduate Attributes)						
	PO1	PO2	PO3	PO4	PO5	PO6	PO 7
CLO1	3	3	3	3	3	3	2
CLO2	3	3	2	3	3	3	2
CLO3	3	3	3	3	3	3	3
CLO4	3	2	2	3	2	3	2
CLO5	3	3	3	3	3	3	3

3- Advance Application

2-Intermediate Level

1-Basic Level

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 Mrs. Susmi Satheesh kumar, Assistant Professor Name & Signature of the Faculty	 Dr. N. Murugalaitha Head Name & Signature <b>Department of Food</b> <b>Processing Technology and Management</b> <b>Hindusthan College of Arts &amp; Science</b> <b>(Autonomous)</b> <b>Coimbatore - 641 028.</b>	 Co-ordinator <b>Curriculum Development Cell</b> <b>Hindusthan College of Arts &amp; Science,</b> <b>Coimbatore-641 028.</b>

<b>DEPARTMENT OF FOOD PROCESSING TECHNOLOGY &amp; MANAGEMENT</b>				<b>CLASS: I B.Sc</b>				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours /Week	CIA	Ext	Total
II	GE	22FPU08	Allied III Food Microbiology	3	3	50	50	100

Nature of Course		
Knowledge and Skill Oriented	Employability Oriented	✓
	Entrepreneurship Oriented	✓
	Skill Development	✓

**Course Objectives**  
To enable the students to:

- Acquire an elementary knowledge and understand the relevance of microscopy and its applications in everyday life.
- Develop an understanding of the role of microorganisms in food industry and in the maintenance of health.
- Learn the types, structure and characteristics of microorganisms.
- Impart knowledge on the factors affecting the growth of microorganism.
- Familiarize with the causes of food spoilage and food borne disease.

Unit	Course Contents	Hours	K Level
I	<b>Introduction to Microbiology and Structure of Microorganisms</b> Definition and history, microscopy, light and electron microscopy, listing other types, general morphology of microorganisms bacteria, fungi, algae, yeast and virus-bacteriophage.	7	Up to K4
II	<b>Growth and Multiplication</b> Microbial biomass, growth curve, definition of batch and continuous culture. Factors Affecting Growth – Intrinsic factors, nutrient content, pH, redox potential, antimicrobial barrier and water activity. Extrinsic factors: Relative humidity, temperature and gaseous atmosphere.	7	Up to K4
III	<b>Microbiology of Perishable Foods</b> Outline of contamination, spoilage and preservation of Vegetables and fruits. Milk and milk products, canned foods, meat and meat products, egg and poultry.	7	Up to K4
IV	<b>Microbiology of Non-Perishable Foods</b> Outline of contamination, spoilage and preservation of cereals and cereal products, sugar and sugar products.	7	Up to K4
V	<b>Beneficial Effects of Microorganisms</b> Fermented foods–Curd, cheese, sauerkraut, meat, soy based foods, alcoholic beverages and vinegar.	8	Up to K4

### Book for Study

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

### Books for Reference

1. Adams M.R. & M.O. Moss., "Food Microbiology", 2015, The Royal Society of Chemistry, Cambridge, New York.
2. Ananthanarayan and Paniker's, "Textbook of Microbiology", The Orient Blackswan, 2017, 10th edition.
3. M.R. Adams, "Food Microbiology", 2018, New Age International Private Limited.
4. C. Manoharachary & K.V.B.R. Tilak, "Principles of Microbiology", 2012, Paperback.
5. Ramesh, "Food Microbiology", Mjp Publishers, 2021.

### Web Resources

1. [https://www.researchgate.net/publication/315712936\\_Natural\\_food\\_pigments\\_application\\_in\\_food\\_products](https://www.researchgate.net/publication/315712936_Natural_food_pigments_application_in_food_products)
2. <https://www.britannica.com/topic/food-preservation>

### Pedagogy:

Lecturing, Power Point Projection through LCD, Assignment, Discussion and Activity.

### Rationale for Nature of the Course

Students may gain knowledge on identification of contaminant and how to eradicate it and preserve the food. They will also know how to apply microbes for beneficiary effects in various food.

### Activities to be given

Seminar, Assignment, Poster

### Course Learning Outcomes

CLOs	On Completion of the Course, the students should be able to	K-Level
CLO1	Explain the characteristics of important pathogens and spoilage Microorganisms in foods.	Up to K2
CLO2	Infer the growth and multiplication of bacteria and to study the extrinsic factors of microbes.	Up to K2
CLO3	Examine the Contamination, Spoilage and Preservation of various Agricultural and dairy products.	Up to K3
CLO4	Analyze the Contamination, Spoilage and Preservation of various non perishable food products.	Up to K4
CLO5	Identify the beneficial effects of microbes in fermented food.	Up to K2



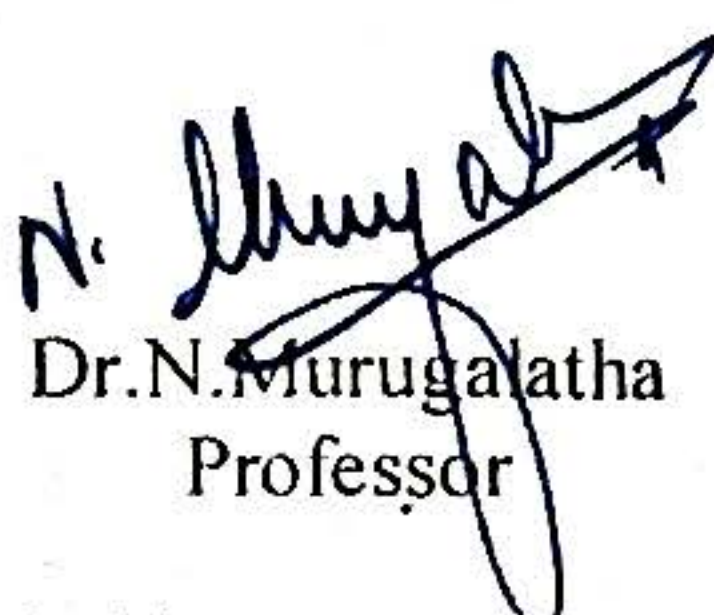

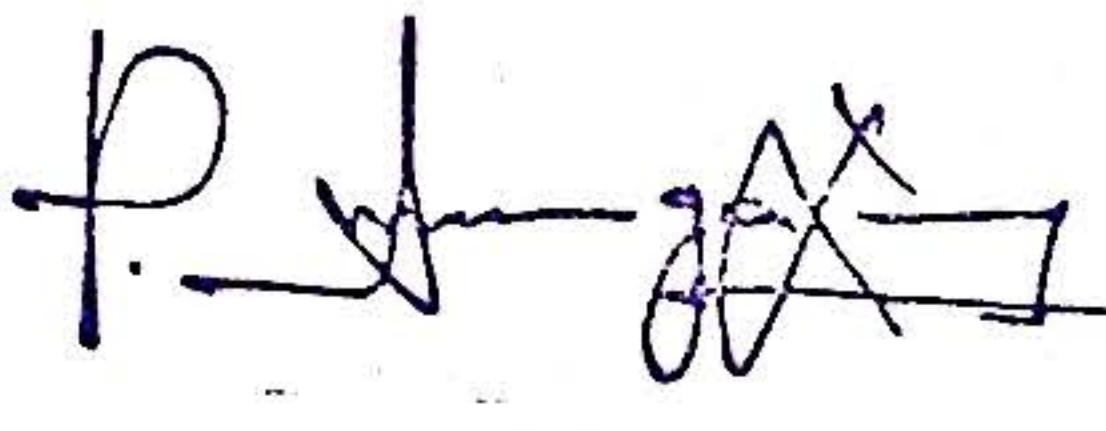
## Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes(POs)

CLOs	Programme Outcomes (with Graduate Attributes)						
	PO1	PO2	PO3	PO4	PO5	PO6	PO 7
CLO1	3	3	3	3	3	3	2
CLO2	3	3	2	2	3	3	2
CLO3	3	3	3	3	3	2	3
CLO4	3	2	2	3	2	3	2
CLO5	3	3	3	2	3	3	3

3- Advance Application

2-Intermediate Level

1 -Basic Level

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 Dr.N.Murugalatha Professor  Name & Signature of the Faculty	 Dr.N.Murugalatha  Name & Signature Head	  Co-ordinator Curriculum Development Cell Hindusthan College of Arts & Science, Coimbatore-641 028.

Department of Food  
 Processing Technology and Management  
 Hindusthan College of Arts & Science  
 (Autonomous)  
 Coimbatore - 641 028.

DEPARTMENT OF FOOD PROCESSING TECHNOLOGY & MANAGEMENT				CLASS: I B.Sc				
Sem	Course Type	Course Code	Course Title	Credits	Contact Hours /Week	CIA	Ext	Total
II	GE	22FPU09	Allied IV- Practical- IV Food Microbiology	2	3	50	50	100

Nature of Course		
Knowledge and Skill Oriented	Employability Oriented	✓
	Entrepreneurship Oriented	✓
	Skill Development	✓

Course Objectives			
To enable the students to:			
<ul style="list-style-type: none"> <li>Gain knowledge on basic microbiological equipments.</li> <li>Learn and apply cleaning and sterilization techniques.</li> <li>Differentiate between the types of microorganisms.</li> <li>Perform staining methods.</li> <li>Determine the portability of water.</li> </ul>			
Unit	Course Contents	Hours	K Level
1	Introduction to the basic microbiology laboratory practices and equipment.	5	Up to K2
2	Preparation and sterilization of nutrient broth and media.	3	Up to K4
3	Morphological study of bacteria and fungi using permanent slides.	4	Up to K4
4	Assessment of surface sanitation by swab/ rinse method.	4	Up to K3
5	Scheme for the detection of food borne pathogens.	4	Up to K2
6	Methylene Blue Reduction Test	3	Up to K4
7	Simple staining and Gram's staining.	3	Up to K3
8	Standard plate count method.	3	Up to K3
9	Bacteriological analysis of water.	3	Up to K4
10	Implementation of FSMS-HACCP, ISO:22000. and Assessment of personal hygiene.	4	Up to K3

#### Book for Study

K. G. Mukerji, 2013, "Laboratory Manual of Food Microbiology"- IK Publishers, I. K. International Pvt Ltd, 30-Dec-2013 - Food - 208 pages

#### Books for Reference

- Fraizer W.C. and Westhoff D.C., 2017, "Food Microbiology", TATA McGraw Hill Publishing Company Ltd. New Delhi.
- Neelima Garg, 2020, Laboratory Manual of Food Microbiology, Dream tech Press.

#### Web Resources

- [https://www.researchgate.net/publication/315712936\\_Natural\\_food\\_pigments\\_application\\_in\\_food\\_products](https://www.researchgate.net/publication/315712936_Natural_food_pigments_application_in_food_products)
- <https://www.britannica.com/topic/food-preservation>

**Pedagogy:**

Hands on Experiments.

**Rationale for Nature of the Course**

Students will be able to analyze the contaminants present in the food and improve their shelf life; they can utilize microbes in food processing.

**Activities to be given**

Seminar, Assignment, Poster

**Course Learning Outcomes**

CLOs	On Completion of the Course, the students should be able to	K-Level
CLO1	Identify the basic microbiological instruments.	Up to K2
CLO2	Experiment with methodologies to prepare different types of media for growing bacteria.	Up to K3
CLO3	Analyze the various microbes in food and water.	Up to K4
CLO4	Examine the quality of milk and its products.	Up to K3
CLO5	Intrepret the causes of spoilage.	Up to K3

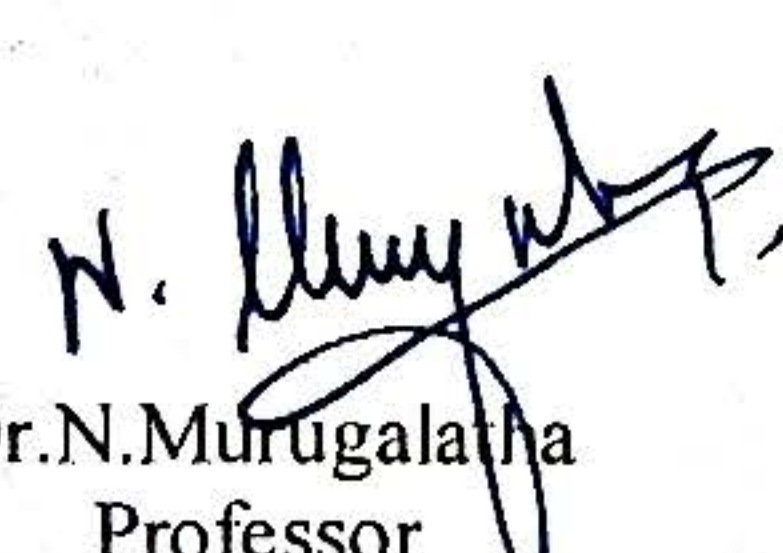
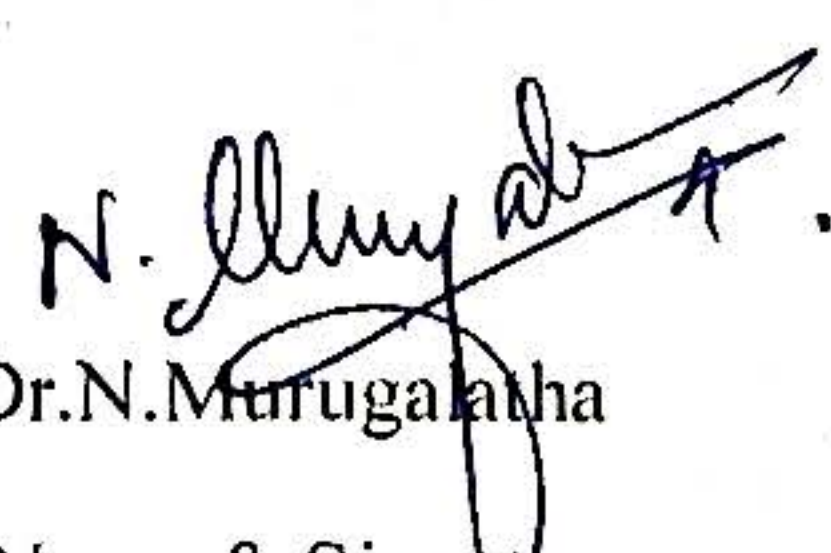
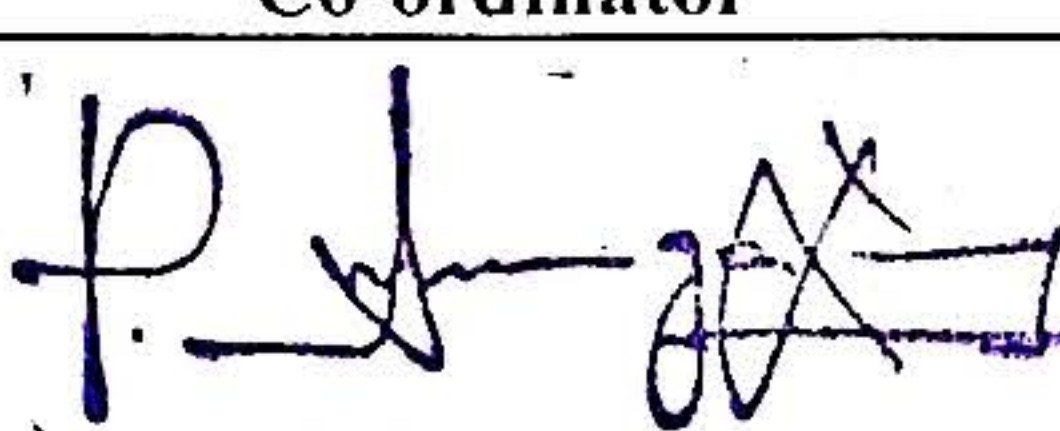
**Mapping of Course Learning Outcomes (CLOs)with Programme Outcomes(POs)**

CLOs	Programme Outcomes (with Graduate Attributes)						
	PO1	PO2	PO3	PO4	PO5	PO6	PO 7
CLO1	3	3	3	3	3	3	2
CLO2	3	3	2	3	3	3	2
CLO3	3	3	3	3	3	3	3
CLO4	3	2	2	3	2	3	2
CLO5	3	3	3	3	3	3	3

3- Advance Application

2-Intermediate Level

1 -Basic Level

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 Dr.N.Murugalatha Professor Name & Signature of the Faculty	 Dr.N.Murugalatha Name & Signature Head	 Co-ordinator Curriculum Development Cell Hindusthan College of Arts & Science, Coimbatore-641 028.

Department of Food  
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