

# B.Sc., FOOD SCIENCE & NUTRITION

## Syllabus

Program Code: UFN

2023-2024 onwards



**MANNAR THIRUMALAI NAICKER COLLEGE**

(AUTONOMOUS)

**Re-accredited with "A" Grade by NAAC**

**PASUMALAI, MADURAI – 625 004**

**GUIDLINES FOR OUTCOME BASED EDUCATION WITH CHOICE BASED  
CREDIT SYSTEM**

**(FOR UG PROGRAM FROM 2023 -2024 ONWARDS)**

**ELIGIBILITY FOR ADMISSION**

Candidates seeking admission to the UG Degree program must have passed the Higher Secondary Education (respective groups – Arts / Science) of the Government of Tamil Nadu or any other state or its equivalent qualification.

**DURATION OF THE COURSE**

The duration of the course shall be three academic years comprising six semesters with two semesters in each academic year.

**Subjects of Study**

Part I : Tamil / Hindi /

Part II : English

Part III:

- 1.Core Subjects
- 2.Allied Subjects
- 3.Electives

Part IV:

- 1.Non Major Electives (I Year)
- 2.Skill Based Subjects
- 3.Environmental Studies - Mandatory Subject
- 4.Value Education - Mandatory Subject

Part V :

Extension Activities

## ARTS & SCIENCE

### CBCS COURSE STRUCTURE FOR UG PROGRAMS

Sem I	Credit	Sem II	Credit	Sem III	Credit	Sem IV	Credit	Sem V	Credit	Sem VI	Credit
1.1. Language - Tamil	3	2.1. Language - Tamil	3	3.1. Language - Tamil	3	4.1. Language - Tamil	3	5.1 Core Course - \CC IX	4	6.1 Core Course - CC XIII	4
1.2 English	3	2.2 English	3	3.2 English	3	4.2 English	3	5.2 Core Course - CC X	4	6.2 Core Course - CC XIV	4
1.3 Core Course - CC I	4	2.3 Core Course - CC III	4	3.3 Core Course - CC V	4	4.3 Core Course - CC VII Core Industry Module	4	5.3. Core Course - CC -XI	4	6.3 Core Course - CC XV	4
1.4 Core Course - CC II	4	2.4 Core Course - CC IV	4	3.4 Core Course - CC VI	4	4.4 Core Course - CC VIII	4	5.3. Core Course -/ Project with viva-voce CC - XII	4	6.4 Elective -VII Generic/ Discipline Specific	3
1.5 Elective I Generic/ Discipline Specific	3	2.5 Elective II Generic/ Discipline Specific	3	3.5 Elective III Generic/ Discipline Specific	3	4.5 Elective IV Generic/ Discipline Specific	3	5.4 Elective V Generic/ Discipline Specific	3	6.5 Elective VIII Generic/ Discipline Specific	3
1.6 Skill Enhancement Course SEC-1 (NME)	2	2.6 Skill Enhancement Course SEC-2 (NME)	2	3.6 Skill Enhancement Course SEC-4, (Entrepreneurial Skill)	1	4.6 Skill Enhancement Course SEC-6	2	5.5 Elective VI Generic/ Discipline Specific	3	6.6 Extension Activity	1
1.7 Ability Enhancement Compulsory Course (AECC) Soft Skill-1	2	2.7 Skill Enhancement Course - SEC-3(NME)	2	3.7 Skill Enhancement Course SEC-5	2	4.7 Skill Enhancement Course SEC-7	2	5.6 Value Education	2	6.7 Professional Competency Skill	2
1.8 Skill Enhancement - (Foundation Course)	2	2.8 Ability Enhancement Compulsory Course (AECC) Soft Skill-2	2	3.7 Ability Enhancement Compulsory Course (AECC) Soft Skill-3	2	4.7 Ability Enhancement Compulsory Course (AECC) Soft Skill-4	2	5.5 Summer Internship /Industrial Training	2		
				3.8 E.V.S	-	4.8 E.V.S	2				
	<b>23</b>		<b>23</b>		<b>22</b>		<b>25</b>		<b>26</b>		<b>21</b>
<b>Total Credit Points</b>											<b>140</b>

**QUESTION PAPER PATTERN FOR THE CONTINUOUS INTERNAL  
ASSESSMENT**

**Note: Duration – 1 hour**

**(FOR PART I, PART II & PART III)**

The components for continuous internal assessment are:

**Part –A**

Four multiple choice questions (answer all) 4 x 01= 04 Marks

**Part –B**

Two questions ('either .... or 'type) 2 x 05= 10 Marks

**Part –C**

Two questions ('either .... or 'type) 2 x 08=16 Marks

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**Total** 30 Marks

**THE COMPONENTS FOR CONTINUOUS INTERNAL ASSESSMENT ARE:**

(60 Marks of two continuous internal assessments will be converted to 15 marks)

Two tests and their average --15 marks

Seminar /Group discussion / Quiz Test --5 marks

Assignment --5 marks

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**Total** 25 Marks

## **QUESTION PAPER PATTERN FOR THE SUMMATIVE EXAMINATIONS:**

**Note: Duration- 3 hours**

### **Part –A**

Ten multiple choice questions 10 x 01 = 10 Marks

No Unit shall be omitted: not more than two questions from each unit.)

### **Part –B**

Five Paragraph questions ('either .... or 'type) 5 x 05 = 25 Marks

(One question from each Unit)

### **Part –C**

Five Paragraph questions ('either .... or 'type) 5 x 08 = 40 Marks

(One question from each Unit)

Total

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75 Marks  
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## **PART-IV- SKILL BASED PAPERS / NME:**

The Scheme of Examination for Skill Based Papers: (Except Practical Lab Subjects)

## **QUESTION PAPER PATTERN FOR THE CONTINUOUS INTERNAL ASSESSMENT (SKILL BASED AND NME COURSES) DURATION – 1 HOUR**

- ❖ 50 MCQs will be asked for each internal assessment tests (50 x 1=50 Marks) and converted for 15 marks

## **THE COMPONENTS FOR CONTINUOUS INTERNAL ASSESSMENT ARE:**

Two tests and their average	--15 marks
Seminar /Group discussion / Quiz Test	-- 5 marks
Assignment	-- 5 marks
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Total	25 Marks
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**SUMMATIVE EXAMINATION PATTERN (SKILL BASED AND NME COURSES) DURATION – 3 HOURS**

Pattern of the Question Paper for Skill Based and Non-Major Elective courses  
(External)

75 Multiple choice questions will be asked from five units (75 x 1=75 Marks)  
(15MCQ's from each unit)

**PART-IV- ENVIRONMENTAL STUDIES AND VALUE EDUCATION**  
**QUESTION PAPER PATTERN (INTERNAL ASSESSMENT)**

Pattern of the Question Paper for Environmental Studies & Value Education  
(Internal)

50 MCQs will be asked for each internal assessment tests (50 x 1=50 Marks) and  
converted for 15 marks

Two tests and their average	--	15 marks
Project	--	10 marks
		-----
Total		25 Marks
		-----

\* The students as Individual or Group must visit a local area to document environmental assets – river / forest / grassland / hill / mountain – visit a local polluted site – urban / rural / industrial / agricultural – study of common plants, insects, birds – study of simple ecosystem – pond, river, hill slopes, etc.

## **SUMMATIVE EXAMINATION PATTERN**

Pattern of the Question Paper for Environmental Studies & Value Education only) (External)

75 Multiple choice questions will be asked from five units (75 x 1=75 Marks)  
(15MCQ's from each unit)

## **PART V EXTENSION ACTIVITIES: (MAXIMUM MARKS: 100)**

1. NCC
2. NSS
3. Physical Education
4. YRC
5. RRC
6. Health & Fitness Club
7. Eco Club
8. Human Rights Club

Internal Examinations - - 25 Marks

Summative Examinations - - 75 Marks

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**100**

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## OUTCOME BASED EDUCATION:

OBE starts with the identification and articulation of clear and measurable learning outcomes for each course or program. These outcomes describe the skills, knowledge, and abilities that students are expected to acquire. The curriculum, instructional methods, and assessments are aligned with the defined learning outcomes. This ensures that everything taught and evaluated is directly related to what students are expected to learn.

The Learning Outcomes-Based Approach to curriculum planning and transaction in our institution ensures whether the teaching-learning processes are oriented towards enabling students to attain the defined learning outcomes relating to the courses within a programme. The outcome based approach, particularly in the context of undergraduate studies, requires a significant shift from teacher-centric to learner-centric pedagogies and from passive to active/participatory pedagogies.

**Assessment Method:** The students are assessed with 2 internal examination and the summative examination which includes problem based assignments; practical assignment laboratory reports; observation of practical skills; individual project reports ,case-study reports; team project reports; oral presentations, including seminar presentation; viva voce interviews; computerized adaptive testing; etc. and any other pedagogic approaches as per the context.





## **INSTITUTIONAL VISION**

To Mould the learners into accomplished individuals by providing them with a stimulus for social change through character, confidence and competence.

## **INSTITUTIONAL MISSION**

1. Enlightening the learners on the ethical and environmental issues.
2. Extending holistic training to shape the learners in to committed and competent citizens.
3. Equipping them with soft skills for facing the competitive world.
4. Enriching their employability through career oriented courses.
5. Ensuring accessibility and opportunity to make education affordable to the underprivileged.

### **Highlights of the Revamped Curriculum:**

- Student-centric, meeting the demands of industry & society, incorporating industrial components, hands-on training, skill enhancement modules, industrial project, project with viva-voce, exposure to entrepreneurial skills, training for competitive examinations, sustaining the quality of the core components and incorporating application oriented content wherever required.
- The Core subjects include latest developments in the education and scientific front, advanced programming packages allied with the discipline topics, practical training, devising mathematical models and algorithms for providing solutions to industry / real life situations. The curriculum also facilitates peer learning with advanced mathematical topics in the final semester, catering to the needs of stakeholders with research aptitude.
- The General Studies and Mathematics based problem solving skills are included as mandatory components in the 'Training for Competitive Examinations' course at the final semester, a first of its kind.
- The curriculum is designed so as to strengthen the Industry-Academia interface and provide more job opportunities for the students.

- The Industrial Statistics course is newly introduced in the fourth semester, to expose the students to real life problems and train the students on designing a mathematical model to provide solutions to the industrial problems.
- The Internship during the second year vacation will help the students gain valuable work experience that connects classroom knowledge to real world experience and to narrow down and focus on the career path.
- Project with viva-voce component in the fifth semester enables the student, application of conceptual knowledge to practical situations. The state of art technologies in conducting a Explain in a scientific and systematic way and arriving at a precise solution is ensured. Such innovative provisions of the industrial training, project and internships will give students an edge over the counterparts in the job market.
- State-of Art techniques from the streams of multi-disciplinary, cross disciplinary and inter disciplinary nature are incorporated as Elective courses, covering conventional topics to the latest - Artificial Intelligence.

**MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS),**

**MADURAI – 625 004**

**B.SC FOOD SCIENCE AND NUTRITION CURRICULUM**

*(For the student admitted during the academic year 2023-2024 onwards)*

Course Code	Title of the Course	Hrs	Credits	Maximum Marks		
				Int	Ext	Total
<b>FIRST SEMESTER</b>						
<b>Part – I</b>	<b>Tamil / Alternative Course</b>					
23UTAGT11	தமிழ் இலக்கிய வரலாறு - I	<b>6</b>	<b>3</b>	<b>25</b>	<b>75</b>	<b>100</b>
<b>Part – II</b>	<b>English</b>					
23UENGE11	GENERAL ENGLISH - I	<b>6</b>	<b>3</b>	<b>25</b>	<b>75</b>	<b>100</b>
<b>Part - III</b>	<b>Core Courses</b>					
23UFNCC11	FOOD SCIENCE	<b>5</b>	<b>5</b>	<b>25</b>	<b>75</b>	<b>100</b>
23UFNCP11	BASIC COOKERY - PRACTICAL	<b>5</b>	<b>5</b>	<b>25</b>	<b>75</b>	<b>100</b>
<b>Part - III</b>	<b>Elective Course</b>					
23UFNEC11	NUTRITION ASSESSMENT AND DIET COUNSELLING	<b>4</b>	<b>3</b>	<b>25</b>	<b>75</b>	<b>100</b>
<b>Part IV</b>	<b>Non Major Elective</b>					
23UFNNM11	FOOD PRODUCT DEVELOPMENT	<b>2</b>	<b>2</b>	<b>25</b>	<b>75</b>	<b>100</b>
<b>Part IV</b>	<b>Foundation Course</b>					
23UFNFC11	PRINCIPLES OF RESOURCE MANAGEMENT	<b>2</b>	<b>2</b>	<b>25</b>	<b>75</b>	<b>100</b>
<b>Total</b>		<b>30</b>	<b>23</b>	<b>175</b>	<b>525</b>	<b>700</b>
<b>SECOND SEMESTER</b>						
<b>Part – I</b>	<b>Tamil / Alternative Course</b>					
23UTAGT21	தமிழ் இலக்கிய வரலாறு – II	<b>6</b>	<b>3</b>	<b>25</b>	<b>75</b>	<b>100</b>
<b>Part – II</b>	<b>English</b>					
23UENGE21	GENERAL ENGLISH - II	<b>6</b>	<b>3</b>	<b>25</b>	<b>75</b>	<b>100</b>
<b>Part - III</b>	<b>Core Courses</b>					
23UFNCC21	HUMAN PHYSIOLOGY	<b>5</b>	<b>5</b>	<b>25</b>	<b>75</b>	<b>100</b>
23UFNCC22	BASICS OF FOOD MICROBIOLOGY	<b>3</b>	<b>3</b>	<b>25</b>	<b>75</b>	<b>100</b>
23UFNCP21	BASICS OF FOOD MICROBIOLOGY - PRACTICAL	<b>2</b>	<b>2</b>	<b>25</b>	<b>75</b>	<b>100</b>
<b>Part - III</b>	<b>Elective Course</b>					
23UCHEA21	CHEMISTRY FOR BIOLOGICAL SCIENCES	<b>4</b>	<b>3</b>	<b>25</b>	<b>75</b>	<b>100</b>
<b>Part IV</b>	<b>Non Major Elective</b>					
23UFNNM21	FOUNDATIONS OF BAKING AND CONFECTIONERY	<b>2</b>	<b>2</b>	<b>25</b>	<b>75</b>	<b>100</b>
<b>Part IV</b>	<b>Skill Enhancement course</b>					
23UFNSC21	FUNDAMENTALS OF ART & DESIGN	<b>2</b>	<b>2</b>	<b>25</b>	<b>75</b>	<b>100</b>
<b>Total</b>		<b>30</b>	<b>23</b>	<b>200</b>	<b>600</b>	<b>800</b>

# FIRST SEMESTER



# MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS)

## DEPARTMENT OF FOOD SCIENCE AND NUTRITION

FOR THOSE WHO JOINED IN 2023-2024 AND AFTER

<b>Course Name</b>	FOOD SCIENCE			
<b>Course Code</b>	23UFNCC11	<b>L</b>	<b>P</b>	<b>C</b>
<b>Category</b>	CORE	5	-	5

### COURSE OBJECTIVES:

- ❖ To enable the students to:
- ❖ Understand the science of food and factors that affect its quality, Nutritive value and shelf life.
- ❖ Understand the physical, biological and chemical characteristics of various foods and their uses.
- ❖ Apply knowledge of foods in planning diets and preparing meals that are safe, nutritious and
- ❖ Palatable.

### UNIT - I Nutrient content of foods and Cooking Methods 10

Classification of foods according to nutrient content. Food groups for balanced diets. Study of the different cooking methods- dry heat, moist and combination methods, solar cooking, microwave cooking – merits and demerits, dishes prepared by these methods

### UNIT - II Cereals, Millets, Pulses, Legumes and Nuts 10

**Cereals** - Classification of Cereals, Structure, nutrient composition, storage, processing, milling, parboiling, scientific methods of preparation and cooking, acceptability and palatability of rice, wheat, maize and millets Cooking of starches Dextrinization and gelatinization, retrogradation and resistant starch.

**Pulses and legumes** - Types, nutritive value, methods of cooking, effect of soaking and germination, judicious combination of cereals and pulses- complementary effect, soya beans, fava beans and kesari dhal methods to inactivate /remove toxins; storage. Nuts - types, composition, market forms, roasting, steaming of nuts, nuts butters; uses in sweets, baking, and confectionery; Storage. Oilseeds – types, methods of processing, uses and shelf life

### UNIT - III Vegetables and Fruits 10

**Vegetables:** Classification, nutritive value, effect of cooking on colour, texture, flavour, appearance and nutritive value, Purchase - storage and preservation

**Fruits:** Classification, nutritive value, changes during ripening, enzymatic browning, uses, preservation

**UNIT - IV Flesh foods, Eggs, and Milk****15**

**Meats** – structure, nutritive value, selection of meat, postmortem changes in meat, ageing, factors affecting tenderness of meat, methods of cooking and storage.

**Poultry**-types, nutritive value, selection and cooking

**Fish** - classification, nutritive value, selection, storage, cooking and preservation.

**Eggs** - Structure, nutritive value, methods of cooking, storage, preservation and uses in cookery; foam formation and factors affecting foam. formation

**Milk and milk products** - Nutritive value, kinds of milk, pasteurization, and homogenization, coagulation of milk, fermentation of milk; milk products - whole and skimmed milk, milk powders and yogurt, ghee, butter, cheese. Storage and preservation

**UNIT - V Fats and oils, sugars, food adjuncts and beverages****15**

**Fats and Oils:** Types, sources-animal fats and vegetable fats, functions, processing difference between cold pressed and regular cooking oils, hydrogenated fat, emulsification, rancidity, smoking point. Factors affecting absorption of oils while frying foods, harmful effects of reheated oils.

**Sugars:** Types and market forms of sugars; stages of sugar cookery, crystallization, factors affecting crystallization, uses in confectionery.

**Food adjuncts and food additives**

**Spices and condiments:** classification, source, use in food preparation, Leavening agents, stabilizers, thickeners, anticaking agents, enzymes, shortenings, stabilizers, flavouring agents, colouring agents, sweeteners-use and abuse.

**Food adulteration Definition, common adulterants in food**

**Beverages** Classification-fruit based beverages; milk-based beverages nutritive. value and uses, alcoholic beverages, coffee, tea and cocoa, malted. beverages. Sources, manufacture, processing, and service; methods of preparation of coffee and tea

**Total Lecture Hours****60****BOOKS FOR STUDY:**

- Srilakshmi B (2019) Food Science, (7th Ed.) New Age International Publishers

**BOOKS FOR REFERENCES:**

- Manay, S. and Shadaksharaswamy, M. (1987) Foods Facts and Principles. New Age International Publishers, New Delhi.
- Peckham, G.C. and Freeland-Graves, J.H. (1979) Foundations of Food Preparation, 4th edition, Macmillan Publishing Co. Inc., New York.
- Shewfelt R.L. (2015) Introducing Food Science. CRC Press, Taylor and Francis Group. Boca Raton
- Srilakshmi B (2019) Food Science, (7th Ed.) New Age International Publishers

- Thangam E.Philip, Modern Cookery for Teaching and the Trade Volume - 1&2 (6th Revised Edition), Orient Black
- Vaclavik, V.A. and Elizabeth, W.C. (2013) Essentials of Food Science.2nd ed. Springer Publication, New Delhi

#### WEB RESOURCES:

- ❖ <https://ia801408.us.archive.org/20/items/textbookoffoodsc0000khad/textbookoffoodsc0000khad.pdf>
- ❖ <https://egyankosh.ac.in/handle/123456789/32947>
- ❖ <https://unacademy.com/content/kerala-psc/study-material/basic-food-science/>

<b>Nature of Course</b>	EMPLOYABILITY		✓	SKILL ORIENTED		ENTREPRENEURSHIP		
<b>Curriculum Relevance</b>	LOCAL		REGIONAL		NATIONAL	✓	GLOBAL	
<b>Changes Made in the Course</b>	Percentage of Change		25 %	No Changes Made		New Course		
<b>* Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.</b>								

#### COURSE OUTCOMES:

#### K LEVEL

After studying this course, the students will be able to:

<b>CO1</b>	Identify foods based on food groups and list their uses.	<b>K1 to K4</b>
<b>CO2</b>	Describe classification, nutritive value, storage and preservation of foods.	<b>K1 to K4</b>
<b>CO3</b>	Explain changes in food due to cooking, processing and factors that affect palatability, acceptability, and nutritive value.	<b>K1 to K4</b>
<b>CO4</b>	Compare different methods of cooking and select the methods best suited for cooking different Foods.	<b>K1 to K4</b>
<b>CO5</b>	Justify the selection, processing, storage, and cooking methods to preserve nutritive values of various foods and make them safe and acceptable	<b>K1 to K4</b>

#### MAPPING WITH PROGRAM OUTCOMES:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
<b>CO1</b>	3	3	3	1	3	2	3	2	2	2
<b>CO2</b>	3	3	3	1	3	2	3	2	2	2
<b>CO3</b>	3	3	3	1	3	2	2	3	2	2
<b>CO4</b>	3	3	3	3	1	3	2	3	2	2
<b>CO5</b>	3	3	3	3	1	3	2	3	2	2
<b>S- STRONG</b>			<b>M - MEDIUM</b>				<b>L - LOW</b>			

**CO / PO MAPPING:**

<b>COS</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CO 2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CO 3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CO 4</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CO 5</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>WEITAGE</b>	<b>15</b>	<b>15</b>	<b>10</b>	<b>15</b>	<b>15</b>
<b>WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>

**LESSON PLAN:**

<b>UNIT</b>	<b>COURSE NAME</b>	<b>HRS</b>	<b>PEDAGOGY</b>
<b>I</b>	Nutrient content of foods and Cooking Methods	<b>10</b>	<b>PPT, CHALK&amp; TALK, VIDEOS</b>
<b>II</b>	Cereals, Millets, Pulses, Legumes and Nuts -	<b>10</b>	<b>PPT, CHALK&amp; TALK, GOOGLE CLASS</b>
<b>III</b>	Vegetables and Fruits	<b>10</b>	<b>PPT, CHALK&amp; TALK</b>
<b>IV</b>	Flesh foods, Eggs, and Milk	<b>15</b>	<b>PPT, CHALK&amp; TALK</b>
<b>V</b>	Fats and oils, sugars, food adjuncts and beverages Fats and Oils	<b>15</b>	<b>PPT, CHALK&amp; TALK</b>



**Learning Outcome Based Education & Assessment (LOBE)  
Formative Examination - Blue Print  
Articulation Mapping – K Levels with Course Outcomes (COs)**

Internal	Cos	K Level	Section A		Section B Either or Choice	Section C Either or Choice
			MCQs			
			No. of Questions	K - Level		
CI	CO1	K1 – K4	2	K1,K2	2 (K2 OR K2)	2(K3 OR K3)
AI	CO2	K1 – K4	2	K1,K2	2 (K2 OR K2)	2 (K4 OR K4)
CI	CO3	K1 – K4	2	K1,K2	2 (K2 OR K2)	2(K3 OR K3)
AII	CO4	K1 – K4	2	K1,K2	2 (K3 OR K3)	2 (K4 OR K4)
Question Pattern CIA I & II		No. of Questions to be asked	4		4	4
		No. of Questions to be answered	4		2	2
		Marks for each question	1		5	8
		Total Marks for each section	4		10	16

**Distribution of Marks with K Level CIA I & CIA II**

	K Level	Section A (Multiple Choice Questions)	Section B (Either / Or Choice)	Section C (Either / Or Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	2			2	21.43	-
	K2	2	20		22	21.43	
	K3			16	16	28.57	42.86
	K4			16	16	28.57	57.14
	Marks	4	20	32	56	100	100
CIA II	K1	2			2	3.57	-
	K2	2	10		12	21.43	
	K3		10	16	26	46.43	25.00
	K4			16	16	28.57	75.00
	Marks	4	20	32	56	100	100

**K1-** Remembering and recalling facts with specific answers

**K2-** Basic understanding of facts and stating main ideas with general answers

**K3-** Application oriented- Solving Problems

**K4-** Examining, analyzing, presentation and make inferences with evidences

**CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.**

<b>Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)</b>						
S. No	COs	K - Level	Section A (MCQs)		Section B (Either / or Choice) With K - LEVEL	Section C (Either / or Choice) With K – LEVEL
			No. of Questions	K – Level		
1	CO1	K1,K2	2	K1,K2	2 (K1,K1)	2 (K2,K2)
2	CO2	K1,K2	2	K1,K2	2 (K2,K2)	2 (K2,K2)
3	CO3	K1,K2	2	K1,K2	2( K2,K2)	2 (K3,K3)
4	CO4	K1,K2	2	K1,K2	2 (K3,K3)	2 (K3,K3)
5	CO5	K1,K2	2	K1,K2	2 (K4,K4)	2 (K4,K4)
<b>No. of Questions to be Asked</b>			10		10	10
<b>No. of Questions to be answered</b>			10		5	5
<b>Marks for each question</b>			1		5	8
<b>Total Marks for each section</b>			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

<b>Distribution of Marks with K Level</b>						
K Level	Section A (Multiple Choice Questions)	Section B (Either or Choice)	Section C (Either/ or Choice)	Total Marks	% of (Marks without choice)	Consolidated %
K1	5	10		15	10.72	51.43
K2	5	20	32	57	40.71	
K3		10	32	42	30.00	30.00
K4		10	16	26	18.57	18.57
Marks	10	50	80	140	100	100
<b>NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.</b>						

## Summative Examinations - Question Paper – Format

Q. No.	Unit	CO	K-level		
Answer ALL the questions			<b>PART – A</b>		<b>(10 x 1 = 10 Marks)</b>
1.	<b>Unit - I</b>	<b>CO1</b>	<b>K1</b>		
				a)	b)
				c)	d)
2.	<b>Unit - I</b>	<b>CO1</b>	<b>K2</b>		
				a)	b)
				c)	d)
3.	<b>Unit - II</b>	<b>CO2</b>	<b>K1</b>		
				a)	b)
				c)	d)
4.	<b>Unit - II</b>	<b>CO2</b>	<b>K2</b>		
				a)	b)
				c)	d)
5.	<b>Unit - III</b>	<b>CO3</b>	<b>K1</b>		
				a)	b)
				c)	d)
6.	<b>Unit - III</b>	<b>CO3</b>	<b>K2</b>		
				a)	b)
				c)	d)
7.	<b>Unit - IV</b>	<b>CO4</b>	<b>K1</b>		
				a)	b)
				c)	d)
8.	<b>Unit - IV</b>	<b>CO4</b>	<b>K2</b>		
				a)	b)
				c)	d)
9.	<b>Unit - V</b>	<b>CO5</b>	<b>K1</b>		
				a)	b)
				c)	d)
10.	<b>Unit - V</b>	<b>CO5</b>	<b>K2</b>		
				a)	b)
				c)	d)

Answer ALL the questions				PART – B	(5 x 5 = 25 Marks)
11. a)	Unit - I	CO1	K1		
OR					
11. b)	Unit - I	CO1	K1		
12. a)	Unit - II	CO2	K2		
OR					
12. b)	Unit - II	CO2	K2		
13. a)	Unit - III	CO3	K2		
OR					
13. b)	Unit - III	CO3	K2		
14. a)	Unit - IV	CO4	K3		
OR					
14. b)	Unit - IV	CO4	K3		
15. a)	Unit - V	CO5	K4		
OR					
15. b)	Unit - V	CO5	K4		

Answer ALL the questions				PART – C	(5 x 8 = 40 Marks)
16. a)	Unit - I	CO1	K2		
OR					
16. b)	Unit - I	CO1	K2		
17. a)	Unit - II	CO2	K2		
OR					
17. b)	Unit - II	CO2	K2		
18. a)	Unit - III	CO3	K3		
OR					
18. b)	Unit - III	CO3	K3		
19. a)	Unit - IV	CO4	K3		
OR					
19. b)	Unit - IV	CO4	K3		
20. a)	Unit - V	CO5	K4		
OR					
20. b)	Unit - V	CO5	K4		



# MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS)

## DEPARTMENT OF FOOD SCIENCE AND NUTRITION

FOR THOSE WHO JOINED IN 2023-2024 AND AFTER

<b>Course Name</b>	BASIC COOKERY - PRACTICAL			
<b>Course Code</b>	23UFNCP11	<b>L</b>	<b>P</b>	<b>C</b>
<b>Category</b>	CORE COURSES	-	5	5

### COURSE OBJECTIVES:

- To Remember the processing and preparation of food products
- To apply different methods of cooking.
- To Analyze skills in handling appliances in laboratories
- To give training on different types of cooking methods.
- To create new recipes in different methods.

### Course Content:

1. Different Cooking methods
2. Use of standard measuring cups and spoons
3. Methods of cooking by using Cereals
4. Methods of cooking by Wheat
5. Preparation of sprouted legumes and malt powder
6. Preparation of nuts based dishes
7. Effect of cooking on Vegetables
8. Evaluation of meat quality
9. Evaluation of egg quality
10. Evaluation of sugar cookery

### BOOKS FOR STUDY:

- Martland, R.E. and Welsby, D.A. (1980) Basic Cookery, Fundamental Recipes and Variations. William Heinemann Ltd., London.
- Krishna Arora (2008) Theory of cookery, Frank Brothers & Co.,
- Negi J (2013) Fundamentals of Culinary Art, S.Chand and Co.

### BOOKS FOR REFERENCES:

- Peckham, G.C. and Freeland-Graves, J.H. (1987) Foundation of food preparation. 4<sup>th</sup> ed. Macmillan Publishing co, New York
- Penfield MP and Ada Marie C (2012), Experimental Food Science, Academic Press, San Diego

### WEB RESOURCES:

- ❖ <http://154.68.126.6/library/Food%20Science%20books/batch1/The%20Food%20Chemistry>
- ❖ [https://www.ihmnotes.in/assets/Docs/Books/Theory\\_of\\_Cookery.pdf](https://www.ihmnotes.in/assets/Docs/Books/Theory_of_Cookery.pdf)
- ❖ <http://staffnew.uny.ac.id/upload/132318572/pendidikan/buku-esp.pdf>

<b>Nature of Course</b>	EMPLOYABILITY		SKILL ORIENTED		✓	ENTREPRENEURSHIP		
<b>Curriculum Relevance</b>	LOCAL		REGIONAL		NATIONAL		GLOBAL	✓
<b>Changes Made in the Course</b>	Percentage of Change		20 %	No Changes Made			New Course	

**\* Treat 20% as each unit (20\*5=100%) and calculate the percentage of change for the course.**

COURSE OUTCOMES:	K LEVEL
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<b>After studying this course, the students will be able to:</b>		
<b>CO1</b>	Identify appropriate methods for weighing dry and wet food ingredients and for cooking different foods	<b>K1</b>
<b>CO2</b>	Select suitable methods for cooking cereals, pulses, vegetables, meat, fish and Poultry	<b>K2</b>
<b>CO3</b>	Apply the principles of cookery, cooking techniques and suitable ingredients in preparing dishes	<b>K2</b>
<b>CO4</b>	Explain the reasons behind the changes that occur during food preparation.	<b>K3</b>
<b>CO5</b>	Justify the best preparation and cooking methods for acceptability and retention of nutrients in different dishes	<b>K4</b>

MAPPING WITH PROGRAM OUTCOMES:										
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CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	1	3	2	3	1	2	2	2	2
CO2	3	1	3	3	3	2	3	2	3	2
CO3	3	2	3	3	3	2	3	2	3	2
CO4	3	3	3	3	3	2	1	1	1	1
CO5	3	3	3	3	3	1	3	3	3	3

**S- STRONG**

**M – MEDIUM**

**L – LOW**

CO / PO MAPPING:					
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COS	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	3	1	3	3
CO 2	3	3	1	3	3
CO 3	3	3	1	3	3
CO 4	3	3	2	3	3
CO 5	3	3	1	3	3
<b>WEITAGE</b>	<b>15</b>	<b>15</b>	<b>6</b>	<b>15</b>	<b>15</b>
<b>WEIGHTED PERCENTAGE OF COURSE</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>3</b>

CONTRIBUTION TO POS						
LESSON PLAN:						
UNIT	COURSE NAME				HRS	PEDAGOGY
1.	Different Cooking methods				5	Lab
2.	Use of standard measuring cups and spoons				5	Lab
3.	Methods of cooking by using Cereals				7	Lab
4.	Methods of cooking by Wheat				8	Lab
5.	Preparation of sprouted legumes and malt powder				10	Lab
6.	Preparation of nuts based dishes				10	Lab
7.	Effect of cooking on Vegetables				7	Lab
8.	Evaluation of meat quality				8	Lab
9.	Evaluation of egg quality				7	Lab
10.	Evaluation of sugar cookery				8	Lab

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)							
INTERNAL	COs	K LEVEL	MAJOR	MINOR	SPOTTERS	RECORD	VIVA
CIAI	CO1	K1					5
	CO2	K2				5	
	CO3	K3			5		
	CO4	K4		5			
	CO5	K4	5				
Question Pattern	No. of Questions to be asked		2 (A-Written B-Practical Demo)	2 (A-Written B-Practical Demo)	2	1	5
	No. of Questions to be answered		2	2	2	1	5
	Marks for each question		A-3 B-2	A-3 B-2	5	10	1
	Total Marks for each section		5	5	5	5	5

Distribution of Marks with K Level									
	K Level	Major	Minor	Spotters	Record	Viva	Total Marks	% of Marks without choice	Consolidated %
CIA	K1	-	-	-	-	5	5	6.66	6.66
	K2	-	-	-	5	-	5	6.66	6.66
	K3	-	-	5	-	-	5	6.66	6.66
	K4	-	5	-	-	-	5	6.66	6.66
	K4	5					5	6.66	6.66

Summative Examination – Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)							
EXTERNAL	COs	K LEVEL	MAJOR	MINOR	SPOTTERS	RECORD	VIVA
CIAI	CO1	K1					5
	CO2	K2				5	
	CO3	K3			20		
	CO4	K4		20			
	CO5	K4	25				
Question Pattern		No. of Questions to be asked	2 (A-Written B-Practical Demo)	2 (A-Written B-Practical Demo)	2	1	5
		No. of Questions to be answered	2	2	2	1	5
		Marks for each question	A-20 B-5	A-15 B-5	5	10	1
		Total Marks for each section	25	20	20	5	5



**Distribution of Marks with K Level CIA**

	<b>K Level</b>	<b>Major</b>	<b>Minor</b>	<b>Spotters</b>	<b>Record</b>	<b>Viva</b>	<b>Total Marks</b>	<b>% of Marks without choice</b>	<b>Consolidated %</b>
<b>CIA</b>	<b>K1</b>					<b>5</b>	<b>5</b>	<b>6.6</b>	<b>6.6</b>
	<b>K2</b>				<b>5</b>		<b>5</b>	<b>6.6</b>	<b>6.6</b>
	<b>K3</b>			<b>20</b>			<b>20</b>	<b>26.6</b>	<b>26.6</b>
	<b>K4</b>		<b>20</b>				<b>20</b>	<b>26.6</b>	<b>26.6</b>
	<b>K4</b>	<b>25</b>					<b>25</b>	<b>33.3</b>	<b>33.3</b>
	<b>Marks</b>	<b>25</b>	<b>20</b>	<b>20</b>	<b>20</b>	<b>5</b>	<b>5</b>	<b>75</b>	<b>100</b>



# MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS)

## DEPARTMENT OF FOOD SCIENCE AND NUTRITION

FOR THOSE WHO JOINED IN 2023-2024 AND AFTER

<b>Course Name</b>	NUTRITIONAL ASSESSMENT AND DIET COUNSELING			
<b>Course Code</b>	23UFNEC11	<b>L</b>	<b>P</b>	<b>C</b>
<b>Category</b>	ELECTIVE COURSE	4	-	3
<b>COURSE OBJECTIVES:</b>				
<ul style="list-style-type: none"><li>➤ To enable the students to :</li><li>➤ Learn the different methods and techniques available to assess nutritional status.</li><li>➤ Use age and gender specific techniques to assess nutritional status.</li><li>➤ Learn the significance of assessment parameters in conditions of health and disease</li></ul>				
<b>UNIT - I Nutritional screening</b>				<b>10</b>
<b>Nutritional screening</b> - Nutritional assessment and Identification of at-risk groups using SGA/ MNA Estimation of total energy requirement using factorial method Plotting growth chart for infants and identifying growth faltering, suggesting suitable nutritional remedies				
<b>UNIT - II Anthropometric assessment</b>				<b>10</b>
<b>Anthropometric assessment</b> - Measurements of height, weight, mid arm circumference, waist circumference Measurement of Body fat using skin fold calipers, body fat analyzer etc. Conduct anthropometric assessment and nutritional diagnosis on a select group of subjects				
<b>UNIT - III Clinical and Biochemical assessment</b>				<b>15</b>
<b>Clinical and Biochemical assessment</b> - Use clinical examination schedule and conduct clinical examination under the guidance of medical supervisor to identify nutrient deficiencies (preferably preschool children) Learn the biochemical tests to be conducted to analyse nutritional deficiencies; analyse available biochemical reports for nutritional adequacy				
<b>UNIT - IV Dietary Assessment</b>				<b>15</b>
<b>Dietary assessment</b> - Estimate nutrient intake using 24-hour recall, food frequency questionnaire. Estimate nutrient intake using appropriate software. Conduct diet survey and suggest alterations in food intake to improve nutrient adequacy				
<b>UNIT - V Diet counseling</b>				<b>10</b>
<b>Diet counseling</b> - Preparing a nutritional assessment sheet for the given patient Planning a diet counseling program with components such as assessment of needs, education of the patient, follow up and establishing rapport with the patient and family member.				
<b>Total Lecture Hours</b>				<b>60</b>

**BOOKS FOR STUDY:**

- Srilakshmi, B. (1997) Dietetics New Age International (P) Ltd,
- The Atlas of Food by Erik Millstone; Tim Lang; Marion Nestle.
- Dietary Reference Intakes by Jennifer J.
- Handbook of Nutrition and Food, Third Edition by Carolyn D.
- Manual of Nutritional Therapeutics by David H.
- Srilakshmi, B. Nutrition Science (2000). New Age International (P) Ltd,

**BOOKS FOR REFERENCES:**

- Gelso Charles, J. and Fretz Bruce, R. (1995) Counselling Psychology, a PRISM Indian edition Harcourt Brace College Publishers
- 2. Gibney, M.J., Margetts, B.M., Kearney, J.M. and Arab, L. (2013). Public Health Nutrition. John Wiley & Sons Inc., New Delhi.
- 3. Guthrie H.A. (1983) Introductory Nutrition C.V. Mosby Co. St. Louis. 4. Insel, P., Ross, D., McMahon, K. And Bernstein, M. (2014).
- 4. Nutrition, 15th edition. Jones & Bartlett Learning, USA.
- 5. Maurice E. Shils, James A. Olson, Moshe Shike (1994) "Modern Nutrition in health and disease", eighth edition, Vol. I & II Lea & Febiger Philadelphia, A Waverly Company.
- 6. Schlenker, E.D. and Long, S. (2007). Williams' Essentials of Nutrition & Diet Therapy, 9th edition. Mosby Elsevier, Canada.
- 7. Srilakshmi, B. (1997) Dietetics New Age International (P) Ltd,
- 8. Wardlaw, G.M. Insel, P.H. (1990) Perspectives in Nutrition, Times Mirror / Mosby College Publishing Co. St. Louis, Toronto, Boston.

**WEB RESOURCES:**

- ❖ <https://guides.emich.edu/c.php?g=187834&p=6723105>
- ❖ <https://netid.emich.edu/cas/login?service=http%3a%2f%2fproxy.>

<b>Nature of Course</b>	EMPLOYABILITY		✓	SKILL ORIENTED		ENTREPRENEURSHIP			
<b>Curriculum Relevance</b>	LOCAL		REGIONAL		NATIONAL	✓	GLOBAL		
<b>Changes Made in the Course</b>	Percentage of Change			No Changes Made			New Course		✓

**\* Treat 20% as each unit (20\*5=100%) and calculate the percentage of change for the course.**

<b>COURSE OUTCOMES:</b>		<b>K LEVEL</b>
<b>After studying this course, the students will be able to:</b>		
<b>CO1</b>	Screen the nutritional status of subjects using appropriate tools.	<b>K1 to K4</b>
<b>CO2</b>	Use anthropometric methods of assessment to classify subjects a belonging to normal, under nutrition, overweight or obesity.	<b>K1 to K4</b>
<b>CO3</b>	Evaluate micronutrient adequacy using clinical and biochemical assessment techniques.	<b>K1 to K4</b>
<b>CO4</b>	Determine adequacy of nutrient intake employing suitable dietary assessment Techniques.	<b>K1 to K4</b>
<b>CO5</b>	Acquire skills in diet counseling using nutritional techniques.	<b>K1 to K4</b>

<b>MAPPING WITH PROGRAM OUTCOMES:</b>										
<b>CO/PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>
<b>CO3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>
<b>CO4</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>
<b>CO5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>
<b>S- STRONG</b>			<b>M – MEDIUM</b>				<b>L - LOW</b>			

<b>CO / PO MAPPING:</b>					
<b>COS</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO 2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO 3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO 4</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO 5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>WEITAGE</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>
<b>WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>

<b>LESSON PLAN:</b>			
<b>UNIT</b>	<b>COURSE NAME</b>	<b>HRS</b>	<b>PEDAGOGY</b>
<b>I</b>	Nutritional screening	<b>10</b>	<b>PPT, Chalk &amp; Talk, Videos</b>
<b>II</b>	Anthropometric assessment	<b>10</b>	<b>PPT, Chalk &amp; Talk, Animated Videos</b>
<b>III</b>	Clinical and Biochemical assessment	<b>15</b>	<b>PPT, Chalk &amp; Talk, Google class</b>

<b>IV</b>	Dietary Assessment	<b>15</b>	<b>PPT, Chalk &amp; Talk, Flash cards</b>
<b>V</b>	Diet counseling	<b>10</b>	<b>PPT, Chalk &amp; Talk, Pictures Drawing charts display in the class rooms</b>

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)						
Internal	Cos	K Level	Section A		Section B Either or Choice	Section C Either or Choice
			MCQs			
			No. of Questions	K - Level		
CI	CO1	K1 – K4	2	K1,K2	2 (K2 OR K2)	2(K3 OR K3)
AI	CO2	K1 – K4	2	K1,K2	2 (K2 OR K2)	2 (K4 OR K4)
CI	CO3	K1 – K4	2	K1,K2	2 (K2 OR K2)	2(K3 OR K3)
AI	CO4	K1 – K4	2	K1,K2	2 (K3 OR K3)	2 (K4 OR K4)
Question Pattern CIA I & II		No. of Questions to be asked	4		4	4
		No. of Questions to be answered	4		2	2
		Marks for each question	1		5	8
		Total Marks for each section	4		10	16

Distribution of Marks with K Level CIA I & CIA II							
	K Level	Section A (Multiple Choice Questions)	Section B (Either / Or Choice)	Section C (Either / Or Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	2			2	21.43	-
	K2	2	20		22	21.43	
	K3			16	16	28.57	
	K4			16	16	28.57	
	Marks	4	20	32	56	100	
CIA II	K1	2			2	3.57	-
	K2	2	10		12	21.43	
	K3		10	16	26	46.43	
	K4			16	16	28.57	
	Marks	4	20	32	56	100	

**K1-** Remembering and recalling facts with specific answers

**K2-** Basic understanding of facts and stating main ideas with general answers

**K3-** Application oriented- Solving Problems

**K4-** Examining, analyzing, presentation and make inferences with evidences

**CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.**

<b>Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)</b>						
S. No	COs	K - Level	Section A (MCQs)		Section B (Either / or Choice) With K - LEVEL	Section C (Either / or Choice) With K – LEVEL
			No. of Questions	K – Level		
1	CO1	K1,K2	2	K1,K2	2 (K1,K1)	2 (K2,K2)
2	CO2	K1,K2	2	K1,K2	2 (K2,K2)	2 (K2,K2)
3	CO3	K1,K2	2	K1,K2	2( K2,K2)	2 (K3,K3)
4	CO4	K1,K2	2	K1,K2	2 (K3,K3)	2 (K3,K3)
5	CO5	K1,K2	2	K1,K2	2 (K4,K4)	2 (K4,K4)
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

<b>Distribution of Marks with K Level</b>						
K Level	Section A (Multiple Choice Questions)	Section B (Either or Choice)	Section C (Either/ or Choice)	Total Marks	% of (Marks without choice)	Consolidated %
K1	5	10		15	10.72	51.43
K2	5	20	32	57	40.71	
K3		10	32	42	30.00	30.00
K4		10	16	26	18.57	18.57
Marks	10	50	80	140	100	100
<b>NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.</b>						

## Summative Examinations - Question Paper – Format

Q. No.	Unit	CO	K-level		
Answer ALL the questions			<b>PART – A</b>		<b>(10 x 1 = 10 Marks)</b>
1.	<b>Unit - I</b>	<b>CO1</b>	<b>K1</b>		
				a)	b)
				c)	d)
2.	<b>Unit - I</b>	<b>CO1</b>	<b>K2</b>		
				a)	b)
				c)	d)
3.	<b>Unit - II</b>	<b>CO2</b>	<b>K1</b>		
				a)	b)
				c)	d)
4.	<b>Unit - II</b>	<b>CO2</b>	<b>K2</b>		
				a)	b)
				c)	d)
5.	<b>Unit - III</b>	<b>CO3</b>	<b>K1</b>		
				a)	b)
				c)	d)
6.	<b>Unit - III</b>	<b>CO3</b>	<b>K2</b>		
				a)	b)
				c)	d)
7.	<b>Unit - IV</b>	<b>CO4</b>	<b>K1</b>		
				a)	b)
				c)	d)
8.	<b>Unit - IV</b>	<b>CO4</b>	<b>K2</b>		
				a)	b)
				c)	d)
9.	<b>Unit - V</b>	<b>CO5</b>	<b>K1</b>		
				a)	b)
				c)	d)
10.	<b>Unit - V</b>	<b>CO5</b>	<b>K2</b>		
				a)	b)
				c)	d)

Answer ALL the questions				PART – B	(5 x 5 = 25 Marks)
11. a)	Unit - I	CO1	K1		
OR					
11. b)	Unit - I	CO1	K1		
12. a)	Unit - II	CO2	K2		
OR					
12. b)	Unit - II	CO2	K2		
13. a)	Unit - III	CO3	K2		
OR					
13. b)	Unit - III	CO3	K2		
14. a)	Unit - IV	CO4	K3		
OR					
14. b)	Unit - IV	CO4	K3		
15. a)	Unit - V	CO5	K4		
OR					
15. b)	Unit - V	CO5	K4		

Answer ALL the questions				PART – C	(5 x 8 = 40 Marks)
16. a)	Unit - I	CO1	K2		
OR					
16. b)	Unit - I	CO1	K2		
17. a)	Unit - II	CO2	K2		
OR					
17. b)	Unit - II	CO2	K2		
18. a)	Unit - III	CO3	K3		
OR					
18. b)	Unit - III	CO3	K3		
19. a)	Unit - IV	CO4	K3		
OR					
19. b)	Unit - IV	CO4	K3		
20. a)	Unit - V	CO5	K4		
OR					
20. b)	Unit - V	CO5	K4		





# MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS)

## DEPARTMENT OF FOOD SCIENCE AND NUTRITION

FOR THOSE WHO JOINED IN 2023-2024 AND AFTER

<b>Course Name</b>	FOOD PRODUCT DEVELOPMENT			
<b>Course Code</b>	23UFNNM11	<b>L</b>	<b>P</b>	<b>C</b>
<b>Category</b>	SKILL ENHANCEMENT	2	-	2

### **COURSE OBJECTIVES: To enable the students to**

- Understand the steps involved in new food product development.
- Learn about consumer preferences and market trends.
- Understand concepts about subjective and objective evaluation of new product.

### **UNIT - I Introduction to New Food Product Development 7**

#### **Introduction to New Food Product development**

Food products definition, Classification,

#### **Characterization Reasons for new food product development**

Factors shaping new product development-Social concerns, health concerns impact of technology and marketplace influence.

#### **Utilizing traditional foods, unconventional sources, functional, nutraceuticals foods for new product development**

#### **Market Survey to identify the new product**

### **UNIT - II Product development 8**

#### **Product Development:**

- a) New Product Development Team
- b) Sources of New Product ideas
- c) Designing new product
- d) Stages of product development
- e) Causes of product failure/ success in product development

### **UNIT - III Product Evaluation and quality control quality Attributes 15**

#### **Product Evaluation and Quality Control**

Quality attributes – physical, chemical, nutritional, microbial, and sensory indicators Principles and types of assessment of quality. Subjective and objective methods of evaluation of product quality. Role of sensory evaluation in consumer product acceptance; requirements for sensory analysis - Sensory panel Evaluation of New Product: Nutritional evaluation (estimation of relevant parameters) Evaluation of shelf-life of the product (testing for appropriate quality parameters- physical, chemical, microbiological and nutrient content acceptability studies)

Food safety standards and regulations: Domestic regulations FSSAI, AGMARK, BIS Quality management systems in India; (ISO9001ISO22000); Global Food safety Initiative; International food standards Various national and international organizations dealing with inspection, traceability and authentication, certification, and quality assurance.

**UNIT - IV Packaging and labeling****10****Packaging and labelling**

Packaging Material-types;

factors affecting type of packaging material used;

Aseptic packaging, modified atmosphere packaging,

Controlled Atmosphere Packaging and active packaging.

Packaging and Labelling of the product – Packaging design, graphics and labelling – FSSAI regulations for food labeling.

**UNIT - V Marketing the product****10****Marketing the product**

Product life cycle

Costing the product and determining the sales price

Advertising and test marketing the product

**Total Lecture Hours****50****BOOKS FOR STUDY:**

- An Integrated approach to New Food Product Development. ed. New York, NY: CRC Press 5. Paine FA, Paine HY (Eds.) (1992)
- A handbook of Food Packaging (2nd ed.), Blackie Academic and Professional. 6. Sharma A (2018).
- Food product Development. CBS Publishers & Distributors Pvt Ltd.
- New Food Product development. Gordon W. Fuller. CRC Publication. 1994.
- Food Product Development: Maximizing success, Woodhead Publishing Ltd,

**BOOKS FOR REFERENCES:**

- Earle M., Earle RL. and Anderson A. (2001)
- Food Product Development: Maximizing success, Woodhead Publishing Ltd,
- Food Series, No. 64, 2001. 2. Fuller, GW (2011). New food product development: From concept to marketplace. 3rd ed. New York, NY: CRC Press 3.
- Lawless HT and Klein BP (1991) Sensory Science Theory and Applications in Foods. Marcel Dekker Inc. 4. Moskowitz HR, Saguy IS and Straus T (2009).

**WEB RESOURCES:**

- ❖ <https://www.destechpub.com/wp-content/uploads/2015/01/Methods-for-Developing-New-Food-Products-preview.pdf>
- ❖ <https://www.youtube.com/watch?v=iL0iIGpa4vg>
- ❖ <https://www.youtube.com/watch?v=5kOXUH8kaCs>

<b>Nature of Course</b>	EMPLOYABILITY		SKILL ORIENTED		✓	ENTREPRENEURSHIP		
<b>Curriculum Relevance</b>	LOCAL	REGIONAL	NATIONAL		✓	GLOBAL		
<b>Changes Made in the Course</b>	Percentage of Change		35 %	No Changes Made		New Course		✓

**\* Treat 20% as each unit (20\*5=100%) and calculate the percentage of change for the course.**

<b>COURSE OUTCOMES:</b>	<b>K LEVEL</b>
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After studying this course, the students will be able to:

<b>CO1</b>	Define the basic concepts in food product development, packaging, costing advertising and marketing.	<b>K1 to K2</b>
<b>CO2</b>	Explain the need, characteristics and factors influencing the new product; testmarketing, packaging and quality attributes.	<b>K1 to K2</b>
<b>CO3</b>	Illustrate the quality attributes, food safety, packaging and labelling regulations, and marketing tools for a food product.	<b>K1 to K2</b>
<b>CO4</b>	Analyze the significance of packaging, labelling, advertising, costing and quality concepts for the new food product	<b>K1 to K2</b>
<b>CO5</b>	Develop a new food product and evaluate its quality and acceptability..	<b>K1 to K2</b>

<b>MAPPING WITH PROGRAM OUTCOMES:</b>										
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CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
<b>CO1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>CO2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>CO3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>CO4</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>
<b>CO5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>

**S- STRONG**

**M – MEDIUM**

**L – LOW**

<b>CO / PO MAPPING:</b>					
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COS	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO 1</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CO 2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CO 3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CO 4</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CO 5</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>WEITAGE</b>	<b>15</b>	<b>15</b>	<b>10</b>	<b>15</b>	<b>15</b>
<b>WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>

<b>LESSON PLAN:</b>			
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UNIT	COURSE NAME	HRS	PEDAGOGY
<b>I</b>	Product Development	<b>8</b>	<b>PPT, CHALK &amp; TALK, VIDEOS</b>
<b>II</b>	Product Evaluation and quality control quality Attributes	<b>15</b>	<b>PPT, CHALK &amp; TALK, GOOGLE CLASS</b>

<b>III</b>	Product Evaluation and quality control quality Attributes	<b>15</b>	<b>PPT,CHALK &amp; TALK</b>
<b>IV</b>	Packaging and Labeling	<b>10</b>	<b>PPT,CHALK &amp; TALK</b>
<b>V</b>	Marketing the Product	<b>10</b>	<b>PPT,CHALK &amp; TALK</b>

<b>Learning Outcome Based Education &amp; Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)</b>				
<b>Internal</b>	<b>Cos</b>	<b>K Level</b>	<b>Section A</b>	
			<b>MCQs</b>	
			<b>No. of. Questions</b>	<b>K - Level</b>
<b>CI</b>	<b>CO1</b>	<b>K1 – K2</b>	<b>25</b>	<b>K1,K2</b>
<b>AI</b>	<b>CO2</b>	<b>K1 – K2</b>	<b>25</b>	<b>K1,K2</b>
<b>CI</b>	<b>CO3</b>	<b>K1 – K2</b>	<b>25</b>	<b>K1,K2</b>
<b>AII</b>	<b>CO4</b>	<b>K1 – K2</b>	<b>25</b>	<b>K1,K2</b>
<b>Question Pattern CIA I &amp; II</b>		<b>No. of Questions to be asked</b>	<b>50</b>	
		<b>No. of Questions to be answered</b>	<b>50</b>	
		<b>Marks for each question</b>	<b>1</b>	
		<b>Total Marks for each section</b>	<b>50</b>	

\* Two Formative examinations will be conducted as a part of Continuous Internal Assessment under which, 50 MCQ's will be asked [50X1=50 marks] from any 4 CO's. (I<sup>st</sup> Test-2 CO's & II<sup>nd</sup> Test-2 CO's) in equal weightage

Distribution of Marks with K Level CIA I & CIA II					
	K Level	Section A (Multiple Choice Questions)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	30	30	60	100
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100
CIA II	K1	30	30	60	100
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100

**K1-** Remembering and recalling facts with specific answers

**K2-** Basic understanding of facts and stating main ideas with general answers

**K3-** Application oriented- Solving Problems

**K4-** Examining, analyzing, presentation and make inferences with evidences

**CO5** will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)				
S. No	COs	K - Level	Section A (MCQs)	
			No. of Questions	K – Level
1	CO1	K1-K2	15	K1,K2
2	CO2	K1-K2	15	K1,K2
3	CO3	K1-K2	15	K1,K2
4	CO4	K1-K2	15	K1,K2
5	CO5	K1-K2	15	K1,K2
No. of Questions to be Asked			75	
No. of Questions to be answered			75	
Marks for each question			1	
Total Marks for each section			75	
(Figures in parenthesis denotes, questions should be asked with the given K level)				

In summative examinations, 75 MCQ's will be asked [75X1=75 marks] from all 5 CO's in equal weightage.

<b>Distribution of Marks with K Level</b>				
<b>K Level</b>	<b>Section A (Multiple Choice Questions)</b>	<b>Total Marks</b>	<b>% of (Marks without choice)</b>	<b>Consolidated %</b>
<b>K1</b>	<b>40</b>	<b>40</b>	<b>53</b>	<b>100</b>
<b>K2</b>	<b>35</b>	<b>35</b>	<b>47</b>	
<b>K3</b>				
<b>K4</b>				
<b>Marks</b>		<b>75</b>	<b>100</b>	<b>100</b>
<b>NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.</b>				



# MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS)

## DEPARTMENT OF FOOD SCIENCE AND NUTRITION

### FOR THOSE WHO JOINED IN 2023-2024 AND AFTER

<b>Course Name</b>	PRINCIPLES OF RESOURCE MANAGEMENT			
<b>Course Code</b>	23UFNFC11	<b>L</b>	<b>P</b>	<b>C</b>
<b>Category</b>	FOUNDATION COURSE	2	-	2

**COURSE OBJECTIVES:** To enable students to:

- Recognize and use appropriate resources to achieve one's goal.
- Develop skills in utilizing the available resources in day-to-day life.
- Gain knowledge about work simplification and effective management of Time, Energy and Money

#### UNIT - I INTRODUCTION TO MANAGEMENT 15

**Introduction to Management** - Management Concepts - Definition, Concept, Micro and Macro environment. Principles of Management Process - Planning, Controlling, Evaluating. Qualities of a Good Manager. Motivational factors - Values, Goals and Standards.

**Activity:** Identification of personal and family values and goals – their interrelationship.

#### UNIT - II RESOURCES 10

**Resources** - Meaning and classification, optimizing the use of family resources, Factors affecting the use of resources.

**Activity:** List out the resources optimizing the goal.

#### UNIT - III TIME MANAGEMENT 10

**Time Management** - Tools in time management - Time norms, Peak loads, Work Curves and rest periods, Time management process - Planning - Steps in making time plans - Controlling the planning action - Evaluation.

**Energy Management**- the efforts required in home making activities , energy required for house hold activities

**Activity:** Preparation of a time schedule and Evaluate time schedule using Gantt chart.

#### UNIT - IV WORK SIMPLIFICATION 15

**Work Simplification** - Definition, Importance, Techniques – Formal and Informal Techniques - Mundel's Classes of change - Planning efficient work areas in kitchen.

**Body Mechanics** - Posture, Gravity, Rhythmic movement, Proper use of Muscle and to take advantage of Momentum.

**Fatigue** - Concepts, Types - Physiological and Psychological fatigue and Managerial process applied to energy.

**Activity:** Study on work heights based on anthropometric measurement on vertical and horizontal planes.

**UNIT - V MONEY MANAGEMENT****15**

**Money Management** - Family Income - Types, sources and methods of augmenting family income.

**Family Expenditure** - Budget - Meaning - Types of budgets, Planning a budget for a family of a fixed income, Hotel / Restaurant, advantages of budgeting, Factors affecting family budget, Engel's law of consumption, methods of handling money - Family financial records, Savings- importance and types.

**Activity:** Preparation of family budget. Study of a saving institution and its scheme.

**Total Lecture Hours****75****BOOKS FOR STUDY:**

- ❖ Varghese, M.A., Ogale, N.N and Srinivasan K (2017), "Home Management" second edition, New age International publishers.
- ❖ [Sylvia M. Asay](#) (2021) "Family resource management", SAGE Publications Inc; Fourth edition
- ❖ Gary Dessler & Biju Varrkey (2020) "Human Resource Management" Pearson Education publication.
- ❖ Ruth E. Deacon (1975) Home Management: Context and Concepts Houghton Mifflin publication
- ❖ Verma (2018) Fundamentals of Home Management: Context and Concepts Lambert publication

**BOOKS FOR REFERENCES:**

- Bela Bhargava (2005), "Family resource Management & Interior Decoration", university book house pvt ltd, ISBN-13: 978-8187339229
- Marion Giordan (2016), "Consumer Education: A handbook for Teachers", Routledge; 1st edition, ISBN-13: 978-1138839151
- Nickell & Dorsey (2002), "Management in Family Living", CBS; 4th edition, ISBN-13: 978-8123908519
- Pushpa Chakravorty (2007), Home Management, New Delhi: Pointer Publishers.
- Rao (2020), "Taxmann's Human Resource Management", Taxmann Publications Pvt. Ltd.; 2nd edition, ISBN-13: 978-9390128396
- Ready GB (2021), "EBC consumer Protection Act", LAW BOOKS, ASIN: B097TQ64QV
- Steven, D.S, (2016). Consumer Economics: A Practical Overview", New York: Routledge Taylor and Francis group.
- Sudhir Dixit (2018), "Time Management", Manjul Publishing House, ISBN-13: 978-9388241106

**WEB RESOURCES:**

- ❖ <http://www.yourarticlelibrary.com/decision-making/decision-making-in-management-definition-and-features-explained/25657/>
- ❖ <http://www.familyresourcemanagement.org/services/goals/>
- ❖ [http://www.nios.ac.in/media/documents/sechmscicour/english/home%20science%20\(eng\)%20ch-15.pdf](http://www.nios.ac.in/media/documents/sechmscicour/english/home%20science%20(eng)%20ch-15.pdf)
- ❖ <https://books.google.co.in/books?id=NJkrzK3CgisC&pg=PA149&lpg=PA149&q=ti>



❖ [me,+energy,+money+as+resource+in+management&source=bl&ots=xmSp-LDkia&sig=57qLKHx2UX3sznBIJhm](#)

<b>Nature of Course</b>	EMPLOYABILITY			SKILL ORIENTED			✓	ENTREPRENEURSHIP			
<b>Curriculum Relevance</b>	LOCAL		REGIONAL			NATIONAL			✓	GLOBAL	
<b>Changes Made in the Course</b>	Percentage of Change			No Changes Made			New Course			✓	

**\* Treat 20% as each unit (20\*5=100%) and calculate the percentage of change for the course.**

COURSE OUTCOMES:	K LEVEL
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After studying this course, the students will be able to:

<b>CO1</b>	Apply the principles of management process in day-to-day life	<b>K1 to K2</b>
<b>CO2</b>	Identify and analyze the need for resources	<b>K1 to K2</b>
<b>CO3</b>	Utilize tools of time management effectively in day-to-day life	<b>K1 to K2</b>
<b>CO4</b>	Apply work simplification techniques while managing work.	<b>K1 to K2</b>
<b>CO5</b>	Develop good decision-making skills and plan a budget within the available income and to maintain accounts.	<b>K1 to K2</b>

MAPPING WITH PROGRAM OUTCOMES:
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CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	S	S	S	s	M	S	S	M
CO2	S	S	S	S	M	s	s	M	S	S
CO3	S	M	S	S	S	s	S	S	S	M
CO4	S	S	S	S	S	s	M	S	S	M
CO5	S	S	S	S	S	M	S	S	S	S

S- STRONG
M - MEDIUM
L - LOW

CO / PO MAPPING:
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COS	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	3	3	3	3
CO 2	3	3	3	3	3
CO 3	3	3	3	3	3
CO 4	3	3	3	3	3
CO 5	3	3	3	3	3
<b>WEITAGE</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>
<b>WEIGHTED PERCENTAGE</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>

OF COURSE CONTRIBUTION TO POS						
LESSON PLAN:						
UNIT	COURSE NAME				HRS	PEDAGOGY
I	<b>Introduction to Management</b> - Management Concepts - Definition, Concept, Micro and Macro environment. Principles of Management Process - Planning, Controlling, Evaluating. Qualities of a Good Manager. Motivational factors - Values, Goals and Standards.				15	Lecturing PowerPoint Seminar
II	<b>Resources</b> - Meaning and classification, optimizing the use of family resources, Factors affecting the use of resources.				10	Lecturing PowerPoint Seminar
III	<b>Time Management</b> - Tools in time management - Time norms, Peak loads, Work Curves and rest periods, Time management process - Planning - Steps in making time plans - Controlling the planning action - Evaluation.				10	Lecturing PowerPoint Seminar
IV	<b>Work Simplification</b> - Definition, Importance, Techniques – Formal and Informal Techniques - Mundel's Classes of change - Planning efficient work areas in kitchen. <b>Body Mechanics</b> - Posture, Gravity, Rhythmic movement, Proper use of Muscle and to take advantage of Momentum. <b>Fatigue</b> - Concepts, Types - Physiological and Psychological fatigue and Managerial process applied to energy.				17	Lecturing PowerPoint Seminar
V	<b>Money Management</b> - Family Income - Types, sources and methods of augmenting family income. <b>Family Expenditure</b> - Budget - Meaning - Types of budgets, Planning a budget for a family of a fixed income, Hotel / Restaurant, advantages of budgeting, Factors affecting family budget, Engel's law of consumption, methods of handling money - Family financial records, Savings- importance and types.				15	Lecturing PowerPoint Seminar

**Learning Outcome Based Education & Assessment (LOBE)  
Formative Examination - Blue Print  
Articulation Mapping – K Levels with Course Outcomes (COs)**

Internal	Cos	K Level	Section A	
			MCQs	
			No. of. Questions	K - Level
CI AI	CO1	K1 – K2	25	K1,K2
	CO2	K1 – K2	25	K1,K2
CI AII	CO3	K1 – K2	25	K1,K2
	CO4	K1 – K2	25	K1,K2
Question Pattern CIA I & II		No. of Questions to be asked	50	
		No. of Questions to be answered	50	
		Marks for each question	1	
		Total Marks for each section	50	

\* Two Formative examinations will be conducted as a part of Continuous Internal Assessment under which, 50 MCQ's will be asked [50X1=50 marks] from any 4 CO's. (I<sup>st</sup> Test-2 CO's & II<sup>nd</sup> Test-2 CO's) in equal weightage

Distribution of Marks with K Level CIA I & CIA II					
	K Level	Section A (Multiple Choice Questions)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	30	30	60	100
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100
CIA II	K1	30	30	60	100
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100

**K1-** Remembering and recalling facts with specific answers

**K2-** Basic understanding of facts and stating main ideas with general answers

**K3-** Application oriented- Solving Problems

**K4-** Examining, analyzing, presentation and make inferences with evidences

**CO5** will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)				
S. No	COs	K - Level	Section A (MCQs)	
			No. of Questions	K – Level
1	CO1	K1-K2	15	K1,K2
2	CO2	K1-K2	15	K1,K2
3	CO3	K1-K2	15	K1,K2
4	CO4	K1-K2	15	K1,K2
5	CO5	K1-K2	15	K1,K2
No. of Questions to be Asked			75	
No. of Questions to be answered			75	
Marks for each question			1	
Total Marks for each section			75	
(Figures in parenthesis denotes, questions should be asked with the given K level)				

In summative examinations, 75 MCQ's will be asked [75X1=75 marks] from all 5 CO's in equal weightage.

Distribution of Marks with K Level				
K Level	Section A (Multiple Choice Questions)	Total Marks	% of (Marks without choice)	Consolidated %
K1	40	40	53	100
K2	35	35	47	
K3				
K4				
Marks		75	100	100
<b>NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.</b>				

# SECOND SEMESTER



# MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS)

## DEPARTMENT OF FOOD SCIENCE AND NUTRITION

FOR THOSE WHO JOINED IN 2023-2024 AND AFTER

<b>Course Name</b>	HUMAN PHYSIOLOGY			
<b>Course Code</b>	23UFNCC21	<b>L</b>	<b>P</b>	<b>C</b>
<b>Category</b>	CORE COURSES	5	-	5

### COURSE OBJECTIVES:

- Gain basic understanding of human anatomy and physiology
- Learn the integrated functioning of cells, tissues, organs and systems.
- Apply the principles of nutrition and dietetics on the basis of thorough understanding of human physiology.

### UNIT - I CELL AND TISSUES ,BLOOD, IMMUNE SYSTEM 12

**Cell and tissues** - Structure of Cell and functions of different of different organelles.

Classification, structure and functions of tissues.

**Blood**- Constituents of blood- RBC, WBC and Platelets and its functions. Erythropoiesis, Blood clotting, Blood groups and his to compatibility

**Immune system**- Antigen, Antibody, Cellular and Humoral Immunity ( in brief)

### UNIT - II NERVOUS SYSTEM , SENSE ORGANS 12

#### Nervous system

General anatomy of nervous system, functions of the different parts

#### Sense organs

Structure and functions of Eye, Ear, Skin. Physiology of Taste and Smell-in Brief

### UNIT - III HEART AND CIRCULATION, RESPIRATORY SYSTEM 10

#### Heart and circulation

Anatomy of the heart and blood vessels, properties of cardiac muscle, origin and conduction of heartbeat, cardiac cycle, cardiac output, blood pressure - definition and factors affecting blood pressure, and description of ECG.

#### Respiratory system

Anatomy and physiology of respiratory organs. Gaseous exchange in the lungs and tissues, Mechanism of respiration

**UNIT - IV DIGESTIVE SYSTEM , EXCRETORY SYSTEM****12****Digestive system**

Anatomy of Gastro-intestinal tract, Structure and functions of Liver and Pancreas. Digestion and absorption of carbohydrates, proteins and fats.

**Excretory system**

Structure of kidney, functions of Nephron

**UNIT - V ENDOCRINE SYSTEM, REPRODUCTIVE SYSTEM****12****Endocrine system**

Functions of hormones secreted by Pancreas, Pituitary gland, thyroid, parathyroid and adrenal glands. Effects of hypo and hyper secretion of these glands.

**Reproductive system**

Anatomy of male and female reproductive organs, Ovarian and Uterine cycle, influence of hormones on pregnancy and lactation.

**Total Lecture Hours 58****BOOKS FOR STUDY:**

- Guyton, A.C. (1979) Physiology of the Human Body. 5th ed. Saunders College of Publishing, Philadelphia.
- Subramaniam, S. and Madhavan Kutty, K. (1971) The Text Book of Physiology. Orient Longman Ltd., Madras.
- ❖ Wilson, K. J. W. (1987) Anatomy and Physiology in Health and Illness. 6th ed. ELBS, Churchill Livingstone, London.

**BOOKS FOR REFERENCES:**

- Beck, W.S. (1971) Human Design. Harcourt Brace Jovanovich Inc., New York.
- Best, C. H. and Taylor, N. B. (1980) Living Body. 4th ed. BIP, Bombay.
- Creager, J. G. (1992) Human Anatomy and Physiology. 2nd ed. WMC Brown Publishers, England.
- Guyton, A.C. (1979) Physiology of the Human Body. 5th ed. Saunders College of Publishing, Philadelphia.
- Subramaniam, S. and Madhavan Kutty, K. (1971) The Text Book of Physiology. Orient Longman Ltd., Madras.
- Tortora G. J. Anagnostakos N.P. (1984) Principles of Anatomy and Physiology, 4th edition, Harper and Row Publishers, New York.
- Waugh A and Grant A. (2012) Ross and Wilson Anatomy and Physiology in Health and Illness. 11th ed. Churchill and Livingstone, Elsevier
- Wilson K. J. W. (1987) Anatomy and Physiology in Health and Illness. 6th ed. ELBS, Churchill Livingstone, London.

**WEB RESOURCES:**

- ❖ <https://youtu.be/uFf0zxQ3rBU>

<b>Nature of Course</b>	EMPLOYABILITY		✓	SKILL ORIENTED		ENTREPRENEURSHIP		
<b>Curriculum Relevance</b>	LOCAL		REGIONAL		NATIONAL	✓	GLOBAL	
<b>Changes Made in the Course</b>	Percentage of Change			No Changes Made			New Course	✓

**\* Treat 20% as each unit (20\*5=100%) and calculate the percentage of change for the course.**

COURSE OUTCOMES:	K LEVEL
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After studying this course, the students will be able to:

<b>CO1</b>	Describe the structure and functions of a cell, various tissues, primary organs and systems in the body	<b>K1 to K4</b>
<b>CO2</b>	Explain the interrelationship between systems for maintenance of equilibrium	<b>K1 to K4</b>
<b>CO3</b>	Evaluate the role of the nervous and endocrine system in regulating the activities of other systems	<b>K1 to K4</b>
<b>CO4</b>	Identify the microscopic structure of basic tissues, label the parts of primary physiological systems in the body such as nervous, respiratory, digestive, endocrine and reproductive systems	<b>K1 to K4</b>
<b>CO5</b>	Perform hematological study of blood such as blood smear, blood count and blood grouping, record pulse, blood pressure and interpret a normal ECG.	<b>K1 to K4</b>

**MAPPING WITH PROGRAM OUTCOMES:**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
<b>CO1</b>	3	3	3	1	3	2	3	2	2	2
<b>CO2</b>	3	3	3	1	3	2	3	2	2	2
<b>CO3</b>	3	3	3	1	3	2	2	3	2	2
<b>CO4</b>	3	3	3	3	1	3	2	3	2	2
<b>CO5</b>	3	3	3	3	1	3	2	3	2	2

**S- STRONG**

**M – MEDIUM**

**L – LOW**

**CO / PO MAPPING:**

COS	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO 1</b>	3	3	2	3	3
<b>CO 2</b>	3	3	2	3	3
<b>CO 3</b>	3	3	2	3	3
<b>CO 4</b>	3	3	2	3	3
<b>CO 5</b>	3	2	2	3	3
<b>WEITAGE</b>	<b>15</b>	<b>15</b>	<b>10</b>	<b>15</b>	<b>15</b>



<b>WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>
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**LESSON PLAN:**

<b>UNIT</b>	<b>COURSE NAME</b>	<b>HRS</b>	<b>PEDAGOGY</b>
<b>I</b>	CELL AND TISSUES ,BLOOD, IMMUNE SYSTEM	<b>12</b>	<b>PPT, Chalk &amp; Talk, VIDEOS</b>
<b>II</b>	NERVOUS SYSTEM , SENSE ORGANS	<b>12</b>	<b>PPT, Chalk &amp; Talk, Demo videos</b>
<b>III</b>	HEART AND CIRCULATION, RESPIRATORY SYSTEM	<b>10</b>	<b>PPT, Chalk &amp; Talk, animated videos</b>
<b>IV</b>	DIGESTIVE SYSTEM , EXCRETORY SYSTEM	<b>12</b>	<b>PPT, Chalk &amp; Talk</b>
<b>V</b>	ENDOCRINE SYSTEM, REPRODUCTIVE SYSTEM	<b>12</b>	<b>PPT, Chalk &amp; Talk</b>

**Learning Outcome Based Education & Assessment (LOBE)  
Formative Examination - Blue Print  
Articulation Mapping – K Levels with Course Outcomes (COs)**

<b>Internal</b>	<b>Cos</b>	<b>K Level</b>	<b>Section A</b>		<b>Section B Either or Choice</b>	<b>Section C Either or Choice</b>
			<b>MCQs</b>			
			<b>No. of Questions</b>	<b>K - Level</b>		
<b>CI</b>	<b>CO1</b>	<b>K1 – K4</b>	2	K1,K2	2 (K2 OR K2)	2(K3 OR K3)
<b>AI</b>	<b>CO2</b>	<b>K1 – K4</b>	2	K1,K2	2 (K2 OR K2)	2 (K4 OR K4)
<b>CI</b>	<b>CO3</b>	<b>K1 – K4</b>	2	K1,K2	2 (K2 OR K2)	2(K3 OR K3)
<b>AII</b>	<b>CO4</b>	<b>K1 – K4</b>	2	K1,K2	2 (K3 OR K3)	2 (K4 OR K4)
<b>Question Pattern CIA I &amp; II</b>		<b>No. of Questions to be asked</b>	4		4	4
		<b>No. of Questions to be answered</b>	4		2	2
		<b>Marks for each question</b>	1		5	8
		<b>Total Marks for each section</b>	4		10	16

Distribution of Marks with K Level CIA I & CIA II							
	K Level	Section A (Multiple Choice Questions)	Section B (Either / Or Choice)	Section C (Either / Or Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	2			2	21.43	-
	K2	2	20		22	21.43	
	K3			16	16	28.57	42.86
	K4			16	16	28.57	57.14
	Marks	4	20	32	56	100	100
CIA II	K1	2			2	3.57	-
	K2	2	10		12	21.43	
	K3		10	16	26	46.43	25.00
	K4			16	16	28.57	75.00
	Marks	4	20	32	56	100	100

**K1-** Remembering and recalling facts with specific answers

**K2-** Basic understanding of facts and stating main ideas with general answers

**K3-** Application oriented- Solving Problems

**K4-** Examining, analyzing, presentation and make inferences with evidences

**CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.**

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)						
S. No	COs	K - Level	Section A (MCQs)		Section B (Either / or Choice) With K - LEVEL	Section C (Either / or Choice) With K – LEVEL
			No. of Questions	K – Level		
1	CO1	K1,K2	2	K1,K2	2 (K1,K1)	2 (K2,K2)
2	CO2	K1,K2	2	K1,K2	2 (K2,K2)	2 (K2,K2)
3	CO3	K1,K2	2	K1,K2	2( K2,K2)	2 (K3,K3)
4	CO4	K1,K2	2	K1,K2	2 (K3,K3)	2 (K3,K3)
5	CO5	K1,K2	2	K1,K2	2 (K4,K4)	2 (K4,K4)
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

<b>Distribution of Marks with K Level</b>						
<b>K Level</b>	<b>Section A (Multiple Choice Questions)</b>	<b>Section B (Either or Choice)</b>	<b>Section C (Either/ or Choice)</b>	<b>Total Marks</b>	<b>% of (Marks without choice)</b>	<b>Consolidated %</b>
<b>K1</b>	<b>5</b>	<b>10</b>		<b>15</b>	<b>10.72</b>	<b>51.43</b>
<b>K2</b>	<b>5</b>	<b>20</b>	<b>32</b>	<b>57</b>	<b>40.71</b>	
<b>K3</b>		<b>10</b>	<b>32</b>	<b>42</b>	<b>30.00</b>	<b>30.00</b>
<b>K4</b>		<b>10</b>	<b>16</b>	<b>26</b>	<b>18.57</b>	<b>18.57</b>
<b>Marks</b>	<b>10</b>	<b>50</b>	<b>80</b>	<b>140</b>	<b>100</b>	<b>100</b>
<b>NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.</b>						

## Summative Examinations - Question Paper – Format

Q. No.	Unit	CO	K-level		
Answer ALL the questions			<b>PART – A</b>		<b>(10 x 1 = 10 Marks)</b>
1.	<b>Unit - I</b>	<b>CO1</b>	<b>K1</b>		
				a)	b)
				c)	d)
2.	<b>Unit - I</b>	<b>CO1</b>	<b>K2</b>		
				a)	b)
				c)	d)
3.	<b>Unit - II</b>	<b>CO2</b>	<b>K1</b>		
				a)	b)
				c)	d)
4.	<b>Unit - II</b>	<b>CO2</b>	<b>K2</b>		
				a)	b)
				c)	d)
5.	<b>Unit - III</b>	<b>CO3</b>	<b>K1</b>		
				a)	b)
				c)	d)
6.	<b>Unit - III</b>	<b>CO3</b>	<b>K2</b>		
				a)	b)
				c)	d)
7.	<b>Unit - IV</b>	<b>CO4</b>	<b>K1</b>		
				a)	b)
				c)	d)
8.	<b>Unit - IV</b>	<b>CO4</b>	<b>K2</b>		
				a)	b)
				c)	d)
9.	<b>Unit - V</b>	<b>CO5</b>	<b>K1</b>		
				a)	b)
				c)	d)
10.	<b>Unit - V</b>	<b>CO5</b>	<b>K2</b>		
				a)	b)
				c)	d)

Answer ALL the questions				PART – B	(5 x 5 = 25 Marks)
11. a)	Unit - I	CO1	K1		
OR					
11. b)	Unit - I	CO1	K1		
12. a)	Unit - II	CO2	K2		
OR					
12. b)	Unit - II	CO2	K2		
13. a)	Unit - III	CO3	K2		
OR					
13. b)	Unit - III	CO3	K2		
14. a)	Unit - IV	CO4	K3		
OR					
14. b)	Unit - IV	CO4	K3		
15. a)	Unit - V	CO5	K4		
OR					
15. b)	Unit - V	CO5	K4		

Answer ALL the questions				PART – C	(5 x 8 = 40 Marks)
16. a)	Unit - I	CO1	K2		
OR					
16. b)	Unit - I	CO1	K2		
17. a)	Unit - II	CO2	K2		
OR					
17. b)	Unit - II	CO2	K2		
18. a)	Unit - III	CO3	K3		
OR					
18. b)	Unit - III	CO3	K3		
19. a)	Unit - IV	CO4	K3		
OR					
19. b)	Unit - IV	CO4	K3		
20. a)	Unit - V	CO5	K4		
OR					
20. b)	Unit - V	CO5	K4		



# MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS)

## DEPARTMENT OF FOOD SCIENCE AND NUTRITION

FOR THOSE WHO JOINED IN 2023-2024 AND AFTER

<b>Course Name</b>	BASICS OF FOOD MICROBIOLOGY			
<b>Course Code</b>	23UFNCC22	<b>L</b>	<b>P</b>	<b>C</b>
<b>Category</b>	ELECTIVE COURSE	3	-	3

### **COURSE OBJECTIVES: To enable the students to :**

- Gain knowledge on the characteristics of micro-organisms in food and environment.
- Understand the role of microorganisms in food spoilage, health and illness.
- Familiarize with the methods of controlling microorganisms.

### **UNIT - I Introduction to Microbes in Foods 15**

#### **Introduction to Microbes in Foods:**

History and Development of Food Microbiology Classification of microorganisms. General morphological characteristics of bacteria, yeast, algae, mold, virus.

Characteristics of predominant microorganisms in food, sources of microorganisms in foods.

### **UNIT - II Microbial spoilage and contamination of food 10**

#### **Microbial spoilage and contamination of common food**

Factors affecting growth of microorganisms- intrinsic and extrinsic. Sources of contamination and spoilage of common foods -Cereal and cereal products, fruits and vegetables, egg, meat and fish, milk and milk products.

### **UNIT - III Beneficial uses of microorganisms in food and health 15**

#### **Beneficial uses of microorganisms in food and health**

Microorganisms used in fermented products - Alcoholic drinks, Dairy products, Bread, Vinegar, Pickled foods. Single-cell protein Food Bio preservatives of microbial origin. Intestinal Bacteria and Probiotics.

### **UNIT - IV Food poisoning and Food borne disease 15**

#### **Food poisoning and Food borne disease**

Food poisoning/ intoxication and food infection- definition. Bacterial food poisoning – Staphylococcus aureus, Clostridium botulinum, Clostridium perfringens, Bacillus cereus

Food Infection- Salmonellosis, Shigellosis, Cholera, Gastroenteritis.

Measures to prevent food poisoning and food borne infection.

**UNIT - V Microorganisms found in water, soil and sewage and control of microorganisms in food 20**

**Microorganisms found in water, soil, air and sewage-**

List of microorganisms and diseases caused; Test for sanitary quality of water, Purification of water

**Control of Microorganisms in food**

Control of Access of Microorganisms: sanitation, sterilization and disinfection Control by Heat (Thermal Processing), Low Temperature, Reduced Water Activity and Drying, Low pH and Organic Acids, Modified Atmosphere, Reducing O-R Potential) Antimicrobial Preservatives and Bacteriophages Irradiation, Novel Processing Technologies, Combination of Methods (Hurdle Concept)

**Total Lecture Hours 75**

**BOOKS FOR STUDY:**

- Ananthanarayan and Paniker. (2017). Text book of Microbiology, Tenth Edition, OrientLongman Limited, Hyderabad
- Ramesh. V. (2007). Food Microbiology, MJP publishers, Chennai.
- Gerald McDonell. (2020). Block's Disinfection, Sterilization and Preservation. 6<sup>th</sup> edition. Lippincott Williams and Wilkins, Philadelphia.
- Virendra Kumar Pandey. (2021). Text book of Food Microbiology ISBN - 13:978
- WM Foster. (2021). Food Microbiology. CBS Publishers and Distributors.

**BOOKS FOR REFERENCES:**

- Parija SC. (2012) Textbook of Microbiology and Immunology, 2<sup>nd</sup> edition, Elsevier India.
- Garbutt J. (1997) Essentials of Food Microbiology, 2<sup>nd</sup> edition, Arnold publication, New York, 1997
- Adams M.R, Moss M.O and Peter.M (2016). Food Microbiology. 4th edition. Royal Society of Chemistry, United Kingdom.
- Frazier W.C and Westhoff D.C. (1995). Food Microbiology. 5<sup>th</sup> edition. Tata Mc GrawHill Publishing Company Ltd, New Delhi. Jay J.M, Loessner MJ and Golden D.A. (2005).
- Modern Food Microbiology. 7th edition, CBS Publishers and Distributors, New Delhi.

**WEB RESOURCES:**

- ❖ <http://people.uleth.ca/~selibl/Biol3200/CourseNotes/MicroTaxonomyCh10.pdf>
- ❖ <https://www.cdc.gov/vaccines/hcp/conversations/downloads/vacsafe-understand-color-office.pdf>
- ❖ <https://www.who.int/news-room/fact-sheets/detail/food-safety>
- ❖ <https://epi.dph.ncdhhs.gov/cd/diseases/food.html>
- ❖ <http://vikaspedia.in/health/nutrition/food-borne-diseases-or-food-poisoning>
- ❖ <https://www.microrao.com/micronotes/sterilization.pdf>
- ❖ <https://ehs.colorado.edu/resources/disinfectants-and-sterilization-methods/>

<b>Nature of Course</b>	EMPLOYABILITY		✓	SKILL ORIENTED		ENTREPRENEURSHIP		
<b>Curriculum Relevance</b>	LOCAL		REGIONAL			NATIONAL	✓	GLOBAL
<b>Changes Made in the Course</b>	Percentage of Change		50 %	No Changes Made			New Course	
<b>* Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.</b>								

<b>COURSE OUTCOMES:</b>	<b>K LEVEL</b>
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<b>After studying this course, the students will be able to:</b>		
<b>CO1</b>	Comprehend the characteristics of microorganisms in food and its environment and apply the knowledge to control them	<b>K1 to K4</b>
<b>CO2</b>	Differentiate between organisms that are beneficial from those causing spoilage	<b>K1 to K4</b>
<b>CO3</b>	Explain the causes and prevention of food poisoning and food borne infections.	<b>K1 to K4</b>
<b>CO4</b>	Identify the microscopic structure of algae, molds, yeast, virus and bacteria	<b>K1 to K4</b>
<b>CO5</b>	Perform appropriate tests to identify the size, shape, arrangement and motility of organisms.	<b>K1 to K4</b>

<b>MAPPING WITH PROGRAM OUTCOMES:</b>
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CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
<b>CO1</b>	3	3	3	3	3	2	3	2	2	3
<b>CO2</b>	3	3	3	3	1	3	2	2	2	3
<b>CO3</b>	3	3	3	3	2	3	2	2	2	3
<b>CO4</b>	3	3	3	3	2	3	2	2	2	3
<b>CO5</b>	3	3	3	3	M	2	2	2	2	3

**S- STRONG**

**M – MEDIUM**

**L – LOW**

<b>CO / PO MAPPING:</b>
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COS	PSO1	PSO2	PSO3	PSO4	PSO5
<b>CO 1</b>	3	3	3	3	3
<b>CO 2</b>	3	3	3	3	3
<b>CO 3</b>	3	3	3	3	3
<b>CO 4</b>	3	3	3	3	3
<b>CO 5</b>	3	3	3	3	3
<b>WEITAGE</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>
<b>WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>



**LESSON PLAN:**

UNIT	COURSE NAME	HRS	PEDAGOGY
I	Introduction to Microbes in Foods	15	PPT, CHALK & TALK, videos
II	Microbial spoilage and contamination of food	15	PPT, CHALK & TALK, Google class
III	Beneficial uses of microorganisms in food and health	10	PPT, CHALK & TALK
IV	Food poisoning and Food borne disease	15	PPT, CHALK & TALK
V	Microorganisms found in water, soil and sewage and control of microorganisms in food	15	PPT, CHALK & TALK

**Learning Outcome Based Education & Assessment (LOBE)  
Formative Examination - Blue Print  
Articulation Mapping – K Levels with Course Outcomes (COs)**

Internal	Cos	K Level	Section A		Section B Either or Choice	Section C Either or Choice
			MCQs			
			No. of Questions	K - Level		
CI	CO1	K1 – K4	2	K1, K2	2 (K2 OR K2)	2 (K3 OR K3)
AI	CO2	K1 – K4	2	K1, K2	2 (K2 OR K2)	2 (K4 OR K4)
CI	CO3	K1 – K4	2	K1, K2	2 (K2 OR K2)	2 (K3 OR K3)
AII	CO4	K1 – K4	2	K1, K2	2 (K3 OR K3)	2 (K4 OR K4)
Question Pattern CIA I & II		No. of Questions to be asked	4		4	4
		No. of Questions to be answered	4		2	2
		Marks for each question	1		5	8
		Total Marks for each section	4		10	16

Distribution of Marks with K Level CIA I & CIA II							
	K Level	Section A (Multiple Choice Questions)	Section B (Either / Or Choice)	Section C (Either / Or Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	2			2	21.43	-
	K2	2	20		22	21.43	
	K3			16	16	28.57	42.86
	K4			16	16	28.57	57.14
	Marks	4	20	32	56	100	100
CIA II	K1	2			2	3.57	-
	K2	2	10		12	21.43	
	K3		10	16	26	46.43	25.00
	K4			16	16	28.57	75.00
	Marks	4	20	32	56	100	100

**K1-** Remembering and recalling facts with specific answers

**K2-** Basic understanding of facts and stating main ideas with general answers

**K3-** Application oriented- Solving Problems

**K4-** Examining, analyzing, presentation and make inferences with evidences

**CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.**

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)						
S. No	COs	K - Level	Section A (MCQs)		Section B (Either / or Choice) With K - LEVEL	Section C (Either / or Choice) With K – LEVEL
			No. of Questions	K – Level		
1	CO1	K1,K2	2	K1,K2	2 (K1,K1)	2 (K2,K2)
2	CO2	K1,K2	2	K1,K2	2 (K2,K2)	2 (K2,K2)
3	CO3	K1,K2	2	K1,K2	2( K2,K2)	2 (K3,K3)
4	CO4	K1,K2	2	K1,K2	2 (K3,K3)	2 (K3,K3)
5	CO5	K1,K2	2	K1,K2	2 (K4,K4)	2 (K4,K4)
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

<b>Distribution of Marks with K Level</b>						
<b>K Level</b>	<b>Section A (Multiple Choice Questions)</b>	<b>Section B (Either or Choice)</b>	<b>Section C (Either/ or Choice)</b>	<b>Total Marks</b>	<b>% of (Marks without choice)</b>	<b>Consolidated %</b>
<b>K1</b>	<b>5</b>	<b>10</b>		<b>15</b>	<b>10.72</b>	<b>51.43</b>
<b>K2</b>	<b>5</b>	<b>20</b>	<b>32</b>	<b>57</b>	<b>40.71</b>	
<b>K3</b>		<b>10</b>	<b>32</b>	<b>42</b>	<b>30.00</b>	<b>30.00</b>
<b>K4</b>		<b>10</b>	<b>16</b>	<b>26</b>	<b>18.57</b>	<b>18.57</b>
<b>Marks</b>	<b>10</b>	<b>50</b>	<b>80</b>	<b>140</b>	<b>100</b>	<b>100</b>

**NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.**

## Summative Examinations - Question Paper – Format

Q. No.	Unit	CO	K-level		
Answer ALL the questions			<b>PART – A</b>		<b>(10 x 1 = 10 Marks)</b>
1.	<b>Unit - I</b>	<b>CO1</b>	<b>K1</b>		
				a)	b)
				c)	d)
2.	<b>Unit - I</b>	<b>CO1</b>	<b>K2</b>		
				a)	b)
				c)	d)
3.	<b>Unit - II</b>	<b>CO2</b>	<b>K1</b>		
				a)	b)
				c)	d)
4.	<b>Unit - II</b>	<b>CO2</b>	<b>K2</b>		
				a)	b)
				c)	d)
5.	<b>Unit - III</b>	<b>CO3</b>	<b>K1</b>		
				a)	b)
				c)	d)
6.	<b>Unit - III</b>	<b>CO3</b>	<b>K2</b>		
				a)	b)
				c)	d)
7.	<b>Unit - IV</b>	<b>CO4</b>	<b>K1</b>		
				a)	b)
				c)	d)
8.	<b>Unit - IV</b>	<b>CO4</b>	<b>K2</b>		
				a)	b)
				c)	d)
9.	<b>Unit - V</b>	<b>CO5</b>	<b>K1</b>		
				a)	b)
				c)	d)
10.	<b>Unit - V</b>	<b>CO5</b>	<b>K2</b>		
				a)	b)
				c)	d)

Answer ALL the questions				PART – B	(5 x 5 = 25 Marks)
11. a)	Unit - I	CO1	K1		
OR					
11. b)	Unit - I	CO1	K1		
12. a)	Unit - II	CO2	K2		
OR					
12. b)	Unit - II	CO2	K2		
13. a)	Unit - III	CO3	K2		
OR					
13. b)	Unit - III	CO3	K2		
14. a)	Unit - IV	CO4	K3		
OR					
14. b)	Unit - IV	CO4	K3		
15. a)	Unit - V	CO5	K4		
OR					
15. b)	Unit - V	CO5	K4		

Answer ALL the questions				PART – C	(5 x 8 = 40 Marks)
16. a)	Unit - I	CO1	K2		
OR					
16. b)	Unit - I	CO1	K2		
17. a)	Unit - II	CO2	K2		
OR					
17. b)	Unit - II	CO2	K2		
18. a)	Unit - III	CO3	K3		
OR					
18. b)	Unit - III	CO3	K3		
19. a)	Unit - IV	CO4	K3		
OR					
19. b)	Unit - IV	CO4	K3		
20. a)	Unit - V	CO5	K4		
OR					
20. b)	Unit - V	CO5	K4		



# MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS)

## DEPARTMENT OF FOOD SCIENCE AND NUTRITION

FOR THOSE WHO JOINED IN 2023-2024 AND AFTER

<b>Course Name</b>	BASICS OF FOOD MICROBIOLOGY – PRACTICAL			
<b>Course Code</b>	23UFNCP21	<b>L</b>	<b>P</b>	<b>C</b>
<b>Category</b>	ELECTIVE COURSE	-	2	2

### **COURSE OBJECTIVES: To enable the students to :**

- To enable the students to :
- To Study of different equipment's in a microbiology lab.
- To learn the Safety practices in microbiology laboratory.
- To study the Microscopy- principles, parts, function and operation
- To Microscopic structure of algae, molds, yeast, virus and bacteria.
- To examine the organisms using simple staining, gram staining and hanging drop technique.
- To demonstrate the sterilization, media preparation and culture streak, pour plate technique.

### **Course content**

1. Study of different equipments in a microbiology lab.
2. Safety practices in microbiology laboratory.
3. Microscopy- principles, parts, function and operation.
4. Microscopic structure of algae, molds, yeast, virus and bacteria.
5. Examination of organisms using simple staining technique.
6. Examination of organisms using gram staining technique.
7. Examination of motility of bacteria using hanging drop technique.
8. Demonstration of sterilization of glassware using hot air oven, autoclave.
9. Demonstration of media preparation-Broth, deep, slant and plates.
10. Demonstration of culture techniques-streak, pour plate.

Visit (at least one) to food processing units or any other organization dealing with advanced methods in food microbiology

### **BOOKS FOR STUDY:**

- Ananthanarayan and Paniker. (2017). Text book of Microbiology, Tenth Edition, Orient Longman Limited, Hyderabad
- Ramesh. V. (2007). Food Microbiology, MJP publishers, Chennai.
- Gerald McDonell. (2020). Block's Disinfection, Sterilization and Preservation. 6<sup>th</sup> edition. Lippincott Williams and Wilkins, Philadelphia.
- Virendra Kumar Pandey. (2021). Text book of Food Microbiology ISBN -13:978
- WM Foster. (2021). Food Microbiology. CBS Publishers and Distributors.

**BOOKS FOR REFERENCES:**

- Parija SC. (2012) Textbook of Microbiology and Immunology, 2<sup>nd</sup> edition, Elsevier India.
- Garbutt J. (1997) Essentials of Food Microbiology, 2<sup>nd</sup> edition, Arnold publication, New York, 1997
- Adams M.R, Moss M.O and Peter.M (2016). Food Microbiology. 4th edition. Royal Society of Chemistry, United Kingdom.
- Frazier W.C and Westhoff D.C. (1995). Food Microbiology. 5<sup>th</sup> edition. Tata Mc Graw Hill Publishing Company Ltd, New Delhi. Jay J.M, Loessner MJ and Golden D.A. (2005).
- Modern Food Microbiology. 7th edition, CBS Publishers and Distributors, New Delhi.

**WEB RESOURCES:**

- ❖ <http://people.uleth.ca/~selibl/Biol3200/CourseNotes/MicroTaxonomyCh10.pdf>
- ❖ <https://www.cdc.gov/vaccines/hcp/conversations/downloads/vacsafe-understand-color-office.pdf>
- ❖ <https://www.who.int/news-room/fact-sheets/detail/food-safety>
- ❖ <https://epi.dph.ncdhhs.gov/cd/diseases/food.html>
- ❖ <http://vikaspedia.in/health/nutrition/food-borne-diseases-or-food-poisoning>
- ❖ <https://www.microrao.com/micronotes/sterilization.pdf>

<b>Nature of Course</b>	EMPLOYABILITY		✓	SKILL ORIENTED		ENTREPRENEURSHIP		
<b>Curriculum Relevance</b>	LOCAL		REGIONAL		NATIONAL	✓	GLOBAL	
<b>Changes Made in the Course</b>	Percentage of Change			No Changes Made			New Course	✓

**\* Treat 20% as each unit (20\*5=100%) and calculate the percentage of change for the course.**

<b>COURSE OUTCOMES:</b>		<b>K LEVEL</b>
<b>After studying this course, the students will be able to:</b>		
<b>CO1</b>	Comprehend the characteristics of microorganisms in food and its environment and apply the knowledge to control them	<b>K1 to K4</b>
<b>CO2</b>	Differentiate between organisms that are beneficial from those causing spoilage	<b>K1 to K4</b>
<b>CO3</b>	Explain the causes and prevention of food poisoning and food borne infections.	<b>K1 to K4</b>
<b>CO4</b>	Identify the microscopic structure of algae, molds, yeast, virus and bacteria	<b>K1 to K4</b>
<b>CO5</b>	Perform appropriate tests to identify the size, shape, arrangement and motility of organisms.	<b>K1 to K4</b>

<b>MAPPING WITH PROGRAM OUTCOMES:</b>										
<b>CO/PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>
<b>CO2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>
<b>CO3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>
<b>CO4</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>
<b>CO5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>M</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>

<b>S- STRONG</b>		<b>M – MEDIUM</b>			<b>L – LOW</b>	
<b>CO / PO MAPPING:</b>						
<b>COS</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>	
<b>CO 1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	
<b>CO 2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	
<b>CO 3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	
<b>CO 4</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	
<b>CO 5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	
<b>WEITAGE</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>	
<b>WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	

**LESSON PLAN:**

<b>SL.NO</b>	<b>COURSE NAME</b>	<b>HRS</b>	<b>PEDAGOGY</b>
<b>1.</b>	Study of different equipment's in a microbiology lab.	<b>8</b>	<b>Lab</b>
<b>2.</b>	Safety practices in microbiology laboratory.	<b>7</b>	<b>Lab</b>
<b>3.</b>	Microscopy- principles, parts, function and operation.	<b>7</b>	<b>Lab</b>
<b>4.</b>	Microscopic structure of algae, molds, yeast, virus and bacteria.	<b>8</b>	<b>Lab</b>
<b>5.</b>	Examination of organisms using simple staining technique.	<b>5</b>	<b>Lab</b>
<b>6.</b>	Examination of organisms using gram staining technique.	<b>5</b>	<b>Lab</b>
<b>7.</b>	Examination of motility of bacteria using hanging drop technique.	<b>8</b>	<b>Lab</b>
<b>8.</b>	Demonstration of sterilization of glassware using hot air oven, autoclave.	<b>7</b>	<b>Lab</b>
<b>9.</b>	Demonstration of media preparation-Broth, deep, slant and plates.	<b>7</b>	<b>Lab</b>
<b>10</b>	Demonstration of culture techniques-streak, pour plate.	<b>7</b>	<b>Lab</b>
<b>11.</b>	Visit (at least one) to food processing units or any other organization dealing with advanced methods in food microbiology.	<b>6</b>	<b>Lab</b>



**Learning Outcome Based Education & Assessment (LOBE)  
Formative Examination - Blue Print  
Articulation Mapping – K Levels with Course Outcomes (COs)**

<b>INTERNAL</b>	<b>COs</b>	<b>K LEVEL</b>	<b>MAJOR</b>	<b>MINOR</b>	<b>SPOTTERS</b>	<b>RECORD</b>	<b>VIVA</b>
<b>CI AI</b>	<b>CO1</b>	<b>K1</b>					<b>5</b>
	<b>CO2</b>	<b>K2</b>				<b>5</b>	
	<b>CO3</b>	<b>K3</b>			<b>5</b>		
	<b>CO4</b>	<b>K4</b>		<b>5</b>			
	<b>CO5</b>	<b>K4</b>	<b>5</b>				
<b>Question Pattern</b>		<b>No. of Questions to be asked</b>	<b>2 (A-Written B-Practical Demo)</b>	<b>2 (A-Written B-Practical Demo)</b>	<b>2</b>	<b>1</b>	<b>5</b>
		<b>No. of Questions to be answered</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>5</b>
		<b>Marks for each question</b>	<b>A-3 B-2</b>	<b>A-3 B-2</b>	<b>5</b>	<b>10</b>	<b>1</b>
		<b>Total Marks for each section</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>

**Distribution of Marks with K Level**

	<b>K Level</b>	<b>Major</b>	<b>Minor</b>	<b>Spotters</b>	<b>Record</b>	<b>Viva</b>	<b>Total Marks</b>	<b>% of Marks without choice</b>	<b>Consolidated %</b>
<b>CIA</b>	<b>K1</b>	-	-	-	-	<b>5</b>	<b>5</b>	<b>6.66</b>	<b>6.66</b>
	<b>K2</b>	-	-	-	<b>5</b>	-	<b>5</b>	<b>6.66</b>	<b>6.66</b>
	<b>K3</b>	-	-	<b>5</b>	-	-	<b>5</b>	<b>6.66</b>	<b>6.66</b>
	<b>K4</b>	-	<b>5</b>	-	-	-	<b>5</b>	<b>6.66</b>	<b>6.66</b>
	<b>K4</b>	<b>5</b>						<b>5</b>	<b>6.66</b>

**Summative Examination – Blue Print  
Articulation Mapping – K Levels with Course Outcomes (COs)**

<b>EXTERNAL</b>	<b>COs</b>	<b>K LEVEL</b>	<b>MAJOR</b>	<b>MINOR</b>	<b>SPOTTERS</b>	<b>RECORD</b>	<b>VIVA</b>
<b>CI AI</b>	<b>CO1</b>	<b>K1</b>					<b>5</b>
	<b>CO2</b>	<b>K2</b>				<b>5</b>	
	<b>CO3</b>	<b>K3</b>			<b>20</b>		
	<b>CO4</b>	<b>K4</b>		<b>20</b>			
	<b>CO5</b>	<b>K4</b>	<b>25</b>				
<b>Question Pattern</b>	No. of Questions to be asked	<b>2 (A-Written B-Practical Demo)</b>	<b>2 (A-Written B-Practical Demo)</b>		<b>2</b>	<b>1</b>	<b>5</b>
	No. of Questions to be answered	<b>2</b>	<b>2</b>		<b>2</b>	<b>1</b>	<b>5</b>
	Marks for each question	<b>A-20 B-5</b>	<b>A-15 B-5</b>		<b>5</b>	<b>10</b>	<b>1</b>
	Total Marks for each section	<b>25</b>	<b>20</b>		<b>20</b>	<b>5</b>	<b>5</b>

**Distribution of Marks with K Level CIA**

	<b>K Level</b>	<b>Major</b>	<b>Minor</b>	<b>Spotters</b>	<b>Record</b>	<b>Viva</b>	<b>Total Marks</b>	<b>% of Marks without choice</b>	<b>Consolidated %</b>
<b>CIA</b>	<b>K1</b>					<b>5</b>	<b>5</b>	<b>6.6</b>	<b>6.6</b>
	<b>K2</b>				<b>5</b>		<b>5</b>	<b>6.6</b>	<b>6.6</b>
	<b>K3</b>			<b>20</b>			<b>20</b>	<b>26.6</b>	<b>26.6</b>
	<b>K4</b>		<b>20</b>				<b>20</b>	<b>26.6</b>	<b>26.6</b>
	<b>K4</b>	<b>25</b>					<b>25</b>	<b>33.3</b>	<b>33.3</b>
	<b>Marks</b>	<b>25</b>	<b>20</b>	<b>20</b>	<b>5</b>	<b>5</b>	<b>75</b>	<b>100</b>	<b>100</b>



# MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS)

## DEPARTMENT OF FOOD SCIENCE AND NUTRITION

FOR THOSE WHO JOINED IN 2023-2024 AND AFTER

<b>Course Name</b>	CHEMISTRY FOR BIOLOGICAL SCIENCES			
<b>Course Code</b>	23UCHEA21	<b>L</b>	<b>P</b>	<b>C</b>
<b>Category</b>	ELECTIVE COURSE	4	-	3
<b>COURSE OBJECTIVES: To enable the students to :</b>				
This course aims to provide knowledge on				
<ul style="list-style-type: none"><li>➤ Nomenclature of carbohydrates.</li><li>➤ Amino Acids and Essential elements of bio system</li><li>➤ Provide fundamentals of photo chemistry</li><li>➤ Importance of specialty drugs and</li><li>➤ Separation and purification techniques.</li></ul>				
<b>UNIT - I CARBOHYDRATES</b>		<b>12</b>		
Classification, preparation and properties of glucose and fructose. Discussion of open chain ring structures of glucose and fructose. Glucose-fructose interconversion. Preparation and properties of sucrose, starch and cellulose.				
<b>UNIT - II AMINO ACIDS AND ESSENTIAL ELEMENTS OF BIOSYSTEM</b>		<b>12</b>		
Classification - preparation and properties of alanine, preparation of dipeptides using Bergmann method - Proteins- classification – structure - Colour reactions – Biological functions – nucleosides -nucleotides – RNA and DNA – structure. Essentials of trace metals in biological system-Na, Cu, K, Zn, Fe, Mg.				
<b>UNIT - III PHOTOCHEMISTRY</b>		<b>12</b>		
Grothus - Drapper's law and Stark-Einstein's law of photochemical equivalence, Quantum yield - Hydrogen -chloride reaction. Phosphorescence, fluorescence, chemiluminescence and photosensitization and photosynthesis (definition with examples).				
<b>UNIT - IV ANALYTICAL CHEMISTRY</b>		<b>12</b>		
Introduction qualitative and quantitative analysis. Principles of volumetric analysis. Separation and purification techniques: extraction, distillation and crystallization. Chromatography: principle and application of column, paper and thin layer chromatography.				
<b>UNIT - V DRUGS AND SPECIALITY CHEMICALS</b>		<b>12</b>		
Definition, structure and uses: Antibiotics viz., Penicillin, Chloramphenicol and Streptomycin; Anaesthetics viz., Chloroform and ether; Antipyretics viz., aspirin, paracetamol and ibuprofen; Artificial Sweeteners viz., saccharin, Aspartame and cyclamate; Organic Halogen compounds viz., Freon, Teflon.				
<b>Total Lecture Hours</b>				<b>60</b>

**BOOKS FOR STUDY:**

- V.Veeraiyan, Textbook of Ancillary Chemistry; High mount publishing house, Chennai, first edition,2009.
- S.Vaithyanathan, Text book of Ancillary Chemistry; Priya Publications, Karur,2006.
- ArunBahl, B.S.Bahl, Advanced Organic Chemistry; S.Chand and Company, New Delhi, twenty third edition,2012.

**BOOKS FOR REFERENCES:**

- Jayashree gosh, Fundamental Concepts of Applied Chemistry; Sultan & Chand, Edition 2006.
- P.L.Soni, H.M.Chawla, Text Book of Organic Chemistry; Sultan Chand & sons, New Delhi, twenty ninth editions, 2007.

**WEB RESOURCES:**

- ❖ <https://archive.nptel.ac.in/content/storage2/courses/104103071/pdf/mod11.pdf>
- ❖ <https://nptel.ac.in/courses/104105038>
- ❖ <https://archive.nptel.ac.in/noc/courses/noc21/SEM2/noc21-cy28/>

<b>Nature of Course</b>	EMPLOYABILITY		✓	SKILL ORIENTED		ENTREPRENEURSHIP		
<b>Curriculum Relevance</b>	LOCAL		REGIONAL		NATIONAL	✓	GLOBAL	
<b>Changes Made in the Course</b>	Percentage of Change		60 %	No Changes Made		New Course		
<b>* Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.</b>								

**COURSE OUTCOMES:****K LEVEL**

After studying this course, the students will be able to:

<b>CO1</b>	Explain the preparation and property of carbohydrate.	<b>K1 to K4</b>
<b>CO2</b>	Enlighten the biological role of transition metals, amino acids and nucleic acids.	<b>K1 to K4</b>
<b>CO3</b>	Outline the various type of photochemical process.	<b>K1 to K4</b>
<b>CO4</b>	Analyzevariousmethodstoidentifyanappropriatemethodfortheseparationof chemicalcomponents.	<b>K1 to K4</b>
<b>CO5</b>	Demonstrate the structure and uses of antibiotics, anesthetics, antipyretics and artificial sugars.	<b>K1 to K4</b>

**MAPPING WITH PROGRAM OUTCOMES:**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
<b>CO1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>3</b>
<b>CO2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>3</b>
<b>CO3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>3</b>

CO4	3	3	3	2	2	2	1	2	2	3
CO5	3	3	3	2	2	2	1	2	2	3
<b>S- STRONG</b>			<b>M – MEDIUM</b>				<b>L – LOW</b>			

**CO / PO MAPPING:**

COS	PSO1	PSO2	PSO3	PSO4	PSO5
CO 1	3	3	3	3	3
CO 2	3	3	3	3	3
CO 3	3	3	3	3	3
CO 4	3	3	3	3	3
CO 5	3	2	3	2	2
<b>WEITAGE</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>
<b>WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>

**LESSON PLAN:**

UNIT	COURSE NAME	HRS	PEDAGOGY
I	<b>CARBOHYDRATES</b> Classification, preparation and properties of glucose and fructose. Discussion of open chain ring structures of glucose and fructose. Glucose-fructose interconversion. Preparation and properties of sucrose, starch and cellulose.	<b>12</b>	<b>Lecturing PowerPoint Seminar</b>
II	<b>AMINO ACIDS AND ESSENTIAL ELEMENTS OF BIOSYSTEM</b> Classification - preparation and properties of alanine, preparation of dipeptides using Bergmann method - Proteins- classification – structure - Colour reactions – Biological functions – nucleosides -nucleotides – RNA and DNA – structure. Essentials of trace metals in biological system-Na, Cu, K, Zn, Fe, Mg.	<b>12</b>	
III	<b>PHOTOCHEMISTRY</b> Grothus - Drapper’s law and Stark-Einstein’s law of photochemical equivalence, Quantum yield - Hydrogen - chloride reaction. Phosphorescence, fluorescence, chemiluminescence and photosensitization and photosynthesis (definition with examples).	<b>12</b>	

<b>IV</b>	<b>ANALYTICAL CHEMISTRY</b> Introduction qualitative and quantitative analysis. Principles of volumetric analysis. Separation and purification techniques: extraction, distillation and crystallization. Chromatography: principle and application of column, paper and thin layer chromatography.	<b>12</b>	
<b>V</b>	<b>DRUGS AND SPECIALITY CHEMICALS</b> Definition, structure and uses: Antibiotics viz., Penicillin, Chloramphenicol and Streptomycin; Anaesthetics viz., Chloroform and ether; Antipyretics viz., aspirin, paracetamol and ibuprofen; Artificial Sweeteners viz., saccharin, Aspartame and cyclamate; Organic Halogen compounds viz., Freon, Teflon.	<b>12</b>	

<b>Learning Outcome Based Education &amp; Assessment (LOBE)</b> <b>Formative Examination - Blue Print</b> <b>Articulation Mapping – K Levels with Course Outcomes (COs)</b>						
Internal	Cos	K Level	Section A		Section B Either or Choice	Section C Either or Choice
			MCQs			
			No. of Questions	K - Level		
CI	CO1	K1 – K4	2	K1,K2	2 (K2 OR K2)	2(K3 OR K3)
AI	CO2	K1 – K4	2	K1,K2	2 (K2 OR K2)	2 (K4 OR K4)
CI	CO3	K1 – K4	2	K1,K2	2 (K2 OR K2)	2(K3 OR K3)
AII	CO4	K1 – K4	2	K1,K2	2 (K3 OR K3)	2 (K4 OR K4)
<b>Question Pattern CIA I &amp; II</b>		No. of Questions to be asked	4		4	4
		No. of Questions to be answered	4		2	2
		Marks for each question	1		5	8
		Total Marks for each section	4		10	16

Distribution of Marks with K Level CIA I & CIA II							
	K Level	Section A (Multiple Choice Questions)	Section B (Either / Or Choice)	Section C (Either / Or Choice)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	2			2	21.43	-
	K2	2	20		22	21.43	
	K3			16	16	28.57	42.86
	K4			16	16	28.57	57.14
	Marks	4	20	32	56	100	100
CIA II	K1	2			2	3.57	-
	K2	2	10		12	21.43	
	K3		10	16	26	46.43	25.00
	K4			16	16	28.57	75.00
	Marks	4	20	32	56	100	100

**K1-** Remembering and recalling facts with specific answers

**K2-** Basic understanding of facts and stating main ideas with general answers

**K3-** Application oriented- Solving Problems

**K4-** Examining, analyzing, presentation and make inferences with evidences

**CO5 will be allotted for individual Assignment which carries five marks as part of CIA component.**

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)						
S. No	COs	K - Level	Section A (MCQs)		Section B (Either / or Choice) With K - LEVEL	Section C (Either / or Choice) With K – LEVEL
			No. of Questions	K – Level		
1	CO1	K1,K2	2	K1,K2	2 (K1,K1)	2 (K2,K2)
2	CO2	K1,K2	2	K1,K2	2 (K2,K2)	2 (K2,K2)
3	CO3	K1,K2	2	K1,K2	2( K2,K2)	2 (K3,K3)
4	CO4	K1,K2	2	K1,K2	2 (K3,K3)	2 (K3,K3)
5	CO5	K1,K2	2	K1,K2	2 (K4,K4)	2 (K4,K4)
No. of Questions to be Asked			10		10	10
No. of Questions to be answered			10		5	5
Marks for each question			1		5	8
Total Marks for each section			10		25	40
(Figures in parenthesis denotes, questions should be asked with the given K level)						

<b>Distribution of Marks with K Level</b>						
<b>K Level</b>	<b>Section A (Multiple Choice Questions)</b>	<b>Section B (Either or Choice)</b>	<b>Section C (Either/ or Choice)</b>	<b>Total Marks</b>	<b>% of (Marks without choice)</b>	<b>Consolidated %</b>
<b>K1</b>	<b>5</b>	<b>10</b>		<b>15</b>	<b>10.72</b>	<b>51.43</b>
<b>K2</b>	<b>5</b>	<b>20</b>	<b>32</b>	<b>57</b>	<b>40.71</b>	
<b>K3</b>		<b>10</b>	<b>32</b>	<b>42</b>	<b>30.00</b>	<b>30.00</b>
<b>K4</b>		<b>10</b>	<b>16</b>	<b>26</b>	<b>18.57</b>	<b>18.57</b>
<b>Marks</b>	<b>10</b>	<b>50</b>	<b>80</b>	<b>140</b>	<b>100</b>	<b>100</b>
<b>NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.</b>						



## Summative Examinations - Question Paper – Format

Q. No.	Unit	CO	K-level		
Answer ALL the questions			<b>PART – A</b>		<b>(10 x 1 = 10 Marks)</b>
1.	<b>Unit - I</b>	<b>CO1</b>	<b>K1</b>		
				a)	b)
				c)	d)
2.	<b>Unit - I</b>	<b>CO1</b>	<b>K2</b>		
				a)	b)
				c)	d)
3.	<b>Unit - II</b>	<b>CO2</b>	<b>K1</b>		
				a)	b)
				c)	d)
4.	<b>Unit - II</b>	<b>CO2</b>	<b>K2</b>		
				a)	b)
				c)	d)
5.	<b>Unit - III</b>	<b>CO3</b>	<b>K1</b>		
				a)	b)
				c)	d)
6.	<b>Unit - III</b>	<b>CO3</b>	<b>K2</b>		
				a)	b)
				c)	d)
7.	<b>Unit - IV</b>	<b>CO4</b>	<b>K1</b>		
				a)	b)
				c)	d)
8.	<b>Unit - IV</b>	<b>CO4</b>	<b>K2</b>		
				a)	b)
				c)	d)
9.	<b>Unit - V</b>	<b>CO5</b>	<b>K1</b>		
				a)	b)
				c)	d)
10.	<b>Unit - V</b>	<b>CO5</b>	<b>K2</b>		
				a)	b)
				c)	d)

Answer ALL the questions				PART – B	(5 x 5 = 25 Marks)
11. a)	Unit - I	CO1	K1		
OR					
11. b)	Unit - I	CO1	K1		
12. a)	Unit - II	CO2	K2		
OR					
12. b)	Unit - II	CO2	K2		
13. a)	Unit - III	CO3	K2		
OR					
13. b)	Unit - III	CO3	K2		
14. a)	Unit - IV	CO4	K3		
OR					
14. b)	Unit - IV	CO4	K3		
15. a)	Unit - V	CO5	K4		
OR					
15. b)	Unit - V	CO5	K4		

Answer ALL the questions				PART – C	(5 x 8 = 40 Marks)
16. a)	Unit - I	CO1	K2		
OR					
16. b)	Unit - I	CO1	K2		
17. a)	Unit - II	CO2	K2		
OR					
17. b)	Unit - II	CO2	K2		
18. a)	Unit - III	CO3	K3		
OR					
18. b)	Unit - III	CO3	K3		
19. a)	Unit - IV	CO4	K3		
OR					
19. b)	Unit - IV	CO4	K3		
20. a)	Unit - V	CO5	K4		
OR					
20. b)	Unit - V	CO5	K4		



# MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS)

## DEPARTMENT OF FOOD SCIENCE AND NUTRITION

### FOR THOSE WHO JOINED IN 2023-2024 AND AFTER

<b>Course Name</b>	FOUNDATIONS OF BAKING AND CONFECTIONERY			
<b>Course Code</b>	23UFNNM21	<b>L</b>	<b>P</b>	<b>C</b>
<b>Category</b>	SKILL ENHANCEMENT	<b>2</b>	<b>-</b>	<b>2</b>
<b>COURSE OBJECTIVES:</b>				
<ul style="list-style-type: none"><li>➤ To Gain insight into the planning and operation of bakery unit.</li><li>➤ To Familiarize with the equipments and tools, hygienic practices relating to baking</li><li>➤ To Understand the role of various ingredients used in the making of breads, cakes, cookies, pastries and various confectioneries</li><li>➤ To Acquire skills in baking and confectionery with an emphasis on special dietary needs</li><li>❖ To develop skill around different bakery and confectionery</li></ul>				
<b>UNIT - I</b>	<b>An Overview of Bakery Industry</b>			<b>10</b>
Current status and growth of bakery industry in India. Baking – principles, process. Layout and organization of a bakery unit. Equipment and tools used in baking and confectionery. Bakery sanitation and personnel hygiene.				
<b>UNIT - II</b>	<b>Ingredients in Bakery and Confectionery</b>			<b>10</b>
Ingredients - Flour, Sugar, Shortenings, Egg, Leavening agents-yeast, baking soda, baking powder, chocolates, cocoa powder. Other ingredients- salt, milk and milk derivatives, malt products, dough improver, oxidizing agents, flavours and colors, nuts, spices and condiments, preserved and candied fruit peels.				
<b>UNIT-III</b>	<b>Breads and Cakes</b>			<b>15</b>
<b>Bread</b> - ingredients, types of breads, faults and its prevention <b>Cakes</b> – ingredients, types of cakes, cake judging, faults and remedies. Different types and techniques of cake decoration -icings and fillings.				
<b>UNIT - IV</b>	<b>Pastries, Cookies and Biscuits</b>			<b>15</b>
<b>Pastries</b> - types of pastries- puff pastry, short crust, phyllo pastry, flaky pastry, choux pastry <b>Cookies &amp; biscuits</b> – ingredients, types and processing.				
<b>UNIT - V</b>	<b>Confectionery and Marketing of Baked Products</b>			<b>10</b>
Chocolates- production, types, chocolate decorations Sugar based confectionery – fudge, fondant, sugar candies. <b>Marketing and sales promotion</b> - costing, packaging and labeling.				
<b>Total Lecture Hours</b>				<b>60</b>

**BOOKS FOR STUDY:**

- Dubey. S.C (2002) Basic Baking.4<sup>th</sup> Edition. Published by the Society of Indian Bakers, New Delhi.
- Sarah R. Lebensky, Pricilla et al., (2004) Textbook of Baking and Pastry Fundamentals, third edition, Pearson Education Ltd.
- The Culinary Institute of America, Baking & Pastry: Mastering the Art and Craft, John Wiley & Sons, Inc New Jersey. 2009.

**BOOKS FOR REFERENCES:**

- John Kingslee (2006) A Professional Text book to Bakery and Confectionary. New Age International Pvt Limited Publisher, New Delhi.
- Uttam K Singh (2011). Theory of Bakery and Confectionary- An Operational Approach. Kanishka Publishers and Distributors, New Delhi.

**WEB RESOURCES:**

- ❖ <https://www.youtube.com/watch?v=dfvkplBBO2g>
- ❖ <https://www.lifestyleasia.com/ind/food-drink/dining/bookmark-the-best-baking-youtube-channels-to-bake-like-a-pro/>
- ❖ [www.bakels.in](http://www.bakels.in)

<b>Nature of Course</b>	EMPLOYABILITY		✓	SKILL ORIENTED		ENTREPRENEURSHIP		
<b>Curriculum Relevance</b>	LOCAL		REGIONAL		NATIONAL		GLOBAL	✓
<b>Changes Made in the Course</b>	Percentage of Change			No Changes Made			New Course	✓
<b>* Treat 20% as each unit (20*5=100%) and calculate the percentage of change for the course.</b>								

COURSE OUTCOMES:								K LEVEL	
After studying this course, the students will be able to:									
<b>CO1</b>	Understand the principles and process of baking and confectionery							<b>K1 to K2</b>	
<b>CO2</b>	Acquire knowledge on role of various ingredients used in baking and confectionery.							<b>K1 to K2</b>	
<b>CO3</b>	Develop skills to design baked goods using alternative healthy ingredients to cater to special dietary needs							<b>K1 to K2</b>	
<b>CO4</b>	Identify and control faults in baking							<b>K1 to K2</b>	
<b>CO5</b>	Enhance entrepreneurial skills in bakery and confectionery to establish a bakery unit.							<b>K1 to K2</b>	

**MAPPING WITH PROGRAM OUTCOMES:**

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
<b>CO1</b>	3	3	3	3	2	3	2	2	2	2
<b>CO2</b>	3	3	3	3	2	2	3	2	3	2
<b>CO3</b>	3	3	3	3	3	3	3	2	3	2
<b>CO4</b>	3	3	3	2	2	2	1	1	1	1

CO5	3	3	3	3	3	2	3	3	3	3	
<b>S- STRONG</b>			<b>M – MEDIUM</b>				<b>L – LOW</b>				
<b>CO / PO MAPPING:</b>											
<b>COS</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>						
CO 1	3	3	3	3	3						
CO 2	3	3	3	3	3						
CO 3	3	3	3	3	3						
CO 4	3	3	3	3	3						
CO 5	3	3	3	3	3						
<b>WEITAGE</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>						
<b>WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>						
<b>LESSON PLAN:</b>											
<b>UNIT</b>	<b>COURSE NAME</b>						<b>HRS</b>	<b>PEDAGOGY</b>			
<b>I</b>	<b>An Overview of Bakery Industry</b> Current status and growth of bakery industry in India. Baking – principles, process. Layout and organization of a bakery unit. Equipment and tools used in baking and confectionery. Bakery sanitation and personnel hygiene.						<b>10</b>	<b>Lecturing PowerPoint Seminar</b>			
<b>II</b>	<b>Ingredients in Bakery and Confectionery</b> Ingredients - Flour, Sugar, Shortenings, Egg, Leavening agents- yeast, baking soda, baking powder, chocolates, cocoa powder. Other ingredients- salt, milk and milk derivatives, malt products, dough improver, oxidizing agents, flavours and colors, nuts, spices and condiments, preserved and candied fruit peels.						<b>10</b>	<b>Lecturing PowerPoint Seminar</b>			
<b>III</b>	<b>Breads and Cakes</b> <b>Bread</b> - ingredients, types of breads, faults and its prevention <b>Cakes</b> – ingredients, types of cakes, cake judging, faults and remedies. Different types and techniques of cake decoration -icings and fillings.						<b>15</b>	<b>Lecturing PowerPoint Seminar</b>			
<b>IV</b>	<b>Pastries, Cookies and Biscuits</b> <b>Pastries</b> - types of pastries- puff pastry, short crust, phyllo pastry, flakypastry, choux pastry						<b>15</b>	<b>Lecturing PowerPoint Seminar</b>			
<b>V</b>	<b>Confectionery and Marketing of Baked Products</b> Chocolates- production, types, chocolate decorations Sugar based confectionery – fudge, fondant, sugar candies.						<b>10</b>	<b>Lecturing PowerPoint Seminar</b>			

Learning Outcome Based Education & Assessment (LOBE) Formative Examination - Blue Print Articulation Mapping – K Levels with Course Outcomes (COs)				
Internal	Cos	K Level	Section A	
			MCQs	
			No. of. Questions	K - Level
CI AI	CO1	K1 – K2	25	K1,K2
	CO2	K1 – K2	25	K1,K2
CI AII	CO3	K1 – K2	25	K1,K2
	CO4	K1 – K2	25	K1,K2
Question Pattern CIA I & II		No. of Questions to be asked	50	
		No. of Questions to be answered	50	
		Marks for each question	1	
		Total Marks for each section	50	

\* Two Formative examinations will be conducted as a part of Continuous Internal Assessment under which, 50 MCQ's will be asked [50X1=50 marks] from any 4 CO's. (I<sup>st</sup> Test-2 CO's & II<sup>nd</sup> Test-2 CO's) in equal weightage

Distribution of Marks with K Level CIA I & CIA II					
	K Level	Section A (Multiple Choice Questions)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	30	30	60	100
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100
CIA II	K1	30	30	60	100
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100

**K1-** Remembering and recalling facts with specific answers

**K2-** Basic understanding of facts and stating main ideas with general answers

**K3-** Application oriented- Solving Problems

**K4-** Examining, analyzing, presentation and make inferences with evidences

**CO5** will be allotted for individual Assignment which carries five marks as part of CIA component.

<b>Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)</b>				
<b>S. No</b>	<b>COs</b>	<b>K - Level</b>	<b>Section A (MCQs)</b>	
			<b>No. of Questions</b>	<b>K – Level</b>
<b>1</b>	<b>CO1</b>	<b>K1-K2</b>	<b>15</b>	<b>K1,K2</b>
<b>2</b>	<b>CO2</b>	<b>K1-K2</b>	<b>15</b>	<b>K1,K2</b>
<b>3</b>	<b>CO3</b>	<b>K1-K2</b>	<b>15</b>	<b>K1,K2</b>
<b>4</b>	<b>CO4</b>	<b>K1-K2</b>	<b>15</b>	<b>K1,K2</b>
<b>5</b>	<b>CO5</b>	<b>K1-K2</b>	<b>15</b>	<b>K1,K2</b>
<b>No. of Questions to be Asked</b>			<b>75</b>	
<b>No. of Questions to be answered</b>			<b>75</b>	
<b>Marks for each question</b>			<b>1</b>	
<b>Total Marks for each section</b>			<b>75</b>	
<b>(Figures in parenthesis denotes, questions should be asked with the given K level)</b>				

In summative examinations, 75 MCQ's will be asked [75X1=75 marks] from all 5 CO's in equal weightage.

<b>Distribution of Marks with K Level</b>				
<b>K Level</b>	<b>Section A (Multiple Choice Questions)</b>	<b>Total Marks</b>	<b>% of (Marks without choice)</b>	<b>Consolidated %</b>
<b>K1</b>	<b>40</b>	<b>40</b>	<b>53</b>	<b>100</b>
<b>K2</b>	<b>35</b>	<b>35</b>	<b>47</b>	
<b>K3</b>				
<b>K4</b>				
<b>Marks</b>		<b>75</b>	<b>100</b>	<b>100</b>
<b>NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.</b>				



# MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS)

## DEPARTMENT OF FOOD SCIENCE AND NUTRITION

FOR THOSE WHO JOINED IN 2023-2024 AND AFTER

<b>Course Name</b>	FUNDAMENTALS OF ART AND DESIGN			
<b>Course Code</b>	23UFNSC21	<b>L</b>	<b>P</b>	<b>C</b>
<b>Category</b>	SKILL ENHANCEMENT COURSE	2	-	2
<b>COURSE OBJECTIVES: To enable students to:</b>				
<ul style="list-style-type: none"><li>➤ Understand the elements, principles of design and principles of housing.</li><li>➤ Learn the concepts of colour and create colour scheme for interiors.</li><li>➤ Learn the application of art principles, elements of design, colour schemes and housing principles in creating aesthetic interiors.</li></ul>				
<b>UNIT - I INTRODUCTION TO ART AND DESIGN</b>				<b>8</b>
<b>Introduction to art and design</b> - Importance of design, Application of good taste and Role of good designer. Types of design- Structural and Decorative design. Classification of Decorative Design - Naturalistic Stylized, Abstract and Geometrical Design. <b>Practical:</b> Sketching different types of designs.				
<b>UNIT - II ELEMENTS OF DESIGN</b>				<b>8</b>
<b>Elements of design</b> - Line and its types – horizontal, vertical, diagonal, curved, zigzag; Shape; Form – 2D&3D, Size, Texture- tactile and visual; light, pattern, Space- positive & negative and Colour-warm and cool. Application of elements to form design. <b>Practical:</b> Creating Optical illusion in Interiors.				
<b>UNIT - III PRINCIPLES OF DESIGN</b>				<b>15</b>
<b>Principles of Design</b> - Harmony – harmony of line, shape, size, texture and ideas. Balance – symmetrical, asymmetrical and radial. Proportion – proportional relationships, Greek oblong and Scale. <b>Emphasis</b> – emphasis through grouping of objects, use of contrast color, decoration, plain background space, unusual lines, shapes, and sizes. <b>Rhythm</b> – achieving rhythm through repetition of shapes, progression of size, continuous line movement, radiation, and gradation. <b>Practical:</b> Application of Art Principles in arranging areas in interiors.				
<b>UNIT - IV COLOUR</b>				<b>8</b>
<b>Colour</b> - Definition, Qualities of colour, Hue, Value, Intensity. Tints and Shades. The colour wheel/systems - Prang colour system, Physicist's Theory, Psychologist's Theory, Harmonies of related colors- Monochromatic, Analogous and Accented Neutral; Harmonies of contrasting colours – Direct, double, split and triad. <b>Practical:</b> Painting different rooms with various colour harmonies.				
<b>UNIT - V HOUSING</b>				<b>8</b>
<b>Housing</b> - Selection of site and functions of house. Basic principles of planning a life space - Orientation, Grouping, Roominess, Lighting, Circulation, Storage Facilities and Privacy. Creating a life space- Factors in planning different rooms – Living Room, Bedroom, Dressing Room, Dining, Kitchen, Study Room, Store room, Bathroom, Utility space, Staircase and Verandah. <b>Practical:</b> Planning layout for different areas in interiors.				
<b>Total Lecture Hours</b>				<b>60</b>



**BOOKS FOR STUDY:**

- ❖ Varghese, M.A., Ogale, N.N and Srinivasan K (2017), “Home Management” second edition, New age International publishers.
- ❖ [Sylvia M. Asay](#) (2021) “Family resource management”, SAGE Publications Inc; Fourth edition
- ❖ Gary Dessler & Biju Varrkey (2020) “Human Resource Management” Pearson Education publication.
- ❖ Verma (2018) Fundamentals of Home Management: Context and Concepts Lambert publication

**BOOKS FOR REFERENCES:**

- Andral. A and Parimalam.P, (2008), “A Text Book of Interior Decoration”, Satish Serial Publishing House.
- Chaudhari, S.N. (2006), “Interior Design”, Aavishkar Publishers, Jaipur.
- Goldstein, (1976), “Art in Every Day Life”, Oxford and IBH Publishing House.
- Kasu, A.A. 2005, “Interior Design”, Ashish Book centre Delhi.
- P.C. Varghese (2013), “Building Construction”, PHI Learning Private Limited.
- Premavathy Seetharaman and Parveen Pannu, (2009), “Interior Design and Decoration”, CBS Publishers and Distributors Pvt Ltd. New Delhi.

**WEB RESOURCES:**

- ❖ <https://www.apartmenttherapy.com/modern-vs-contemporary-vs-minimalist-design-261783>
- ❖ [https://www.google.co.in/?gfe\\_rd=cr&ei=oJE8VvucFM0l8wfe0ZnICw#tbn=vid&q=principles+of+design+in+interior+design](https://www.google.co.in/?gfe_rd=cr&ei=oJE8VvucFM0l8wfe0ZnICw#tbn=vid&q=principles+of+design+in+interior+design)
- ❖ <http://www.docstoc.com/docs/108663367/The-Munsell-and-Prang-Color-Systems>
- ❖ <https://www.decorilla.com/online-decorating/transitional-interior-design/>

<b>Nature of Course</b>	EMPLOYABILITY		SKILL ORIENTED		✓	ENTREPRENEURSHIP		
<b>Curriculum Relevance</b>	LOCAL	REGIONAL	NATIONAL		✓	GLOBAL		
<b>Changes Made in the Course</b>	Percentage of Change		No Changes Made			New Course		✓

**\* Treat 20% as each unit (20\*5=100%) and calculate the percentage of change for the course.**

<b>COURSE OUTCOMES:</b>		<b>K LEVEL</b>
<b>After studying this course, the students will be able to:</b>		
<b>CO1</b>	Classify design types like structural and decorative design	<b>K1 to K2</b>
<b>CO2</b>	Use different elements of design appropriately in creating design objects.	<b>K1 to K2</b>
<b>CO3</b>	Apply the Art principles in Interior Design.	<b>K1 to K2</b>
<b>CO4</b>	Apply colour harmonies in various rooms.	<b>K1 to K2</b>
<b>CO5</b>	Explain the principles in planning a life space	<b>K1 to K2</b>

<b>MAPPING WITH PROGRAM OUTCOMES:</b>										
<b>CO/PO</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PO8</b>	<b>PO9</b>	<b>PO10</b>
<b>CO1</b>	<b>1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CO2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>
<b>CO4</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>S- STRONG</b>			<b>M – MEDIUM</b>				<b>L – LOW</b>			

<b>CO / PO MAPPING:</b>					
<b>COS</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO 1</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO 2</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO 3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO 4</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO 5</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>WEITAGE</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>15</b>
<b>WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>

**LESSON PLAN:**

UNIT	COURSE NAME	HRS	PEDAGOGY
I	<p><b>Introduction to art and design</b> - Importance of design, Application of good taste and Role of good designer.Types of design- Structural and Decorative design. Classification of Decorative Design - Naturalistic Stylized, Abstract and Geometrical Design.</p> <p><b>Practical:</b> Sketching different types of designs.</p>	10	Lecturing PowerPoint Seminar
II	<p><b>Elements of design</b> - Line and its types – horizontal, vertical, diagonal, curved, zigzag; Shape; Form – 2D&amp;3D, Size, Texture- tactile and visual; light, pattern, Space- positive &amp; negative and Colour-warm and cool.</p> <p>Application of elements to form design.</p> <p><b>Practical:</b> Creating Optical illusion in Interiors.</p>	10	Lecturing PowerPoint Seminar
III	<p><b>Principles of Design</b> - Harmony – harmony of line, shape, size, texture and ideas.Balance – symmetrical, asymmetrical and radial. Proportion – proportional relationships, Greek oblong and Scale.</p> <p>Emphasis – emphasis through grouping of objects, use of contrast color, decoration,plain background space, unusual lines, shapes, and sizes.</p> <p>Rhythm – achieving rhythm through repetition of shapes, progression of size,continuous line movement, radiation, and gradation.</p> <p><b>Practical:</b> Application of Art Principles in arranging areas in interiors</p>	20	Lecturing PowerPoint Seminar
IV	<p><b>Colour</b> - Definition, Qualities of colour, Hue, Value, Intensity. Tints and Shades. The colour wheel/systems - Prang colour system, Physicist’s Theory, Psychologist’s Theory, Harmonies of related colors- Monochromatic, Analogous and Accented Neutral; Harmonies of contrasting colours – Direct, double, split and triad.</p> <p><b>Practical:</b> Painting different rooms with various colour harmonies.</p>	10	Lecturing PowerPoint Seminar
V	<p><b>Housing</b> - Selection of site and functions of house. Basic principles of planning a life space - Orientation, Grouping, Roominess, Lighting, Circulation, Storage Facilities and Privacy. Creating a life space- Factors in planning different rooms – Living Room, Bedroom, Dressing Room, Dining, Kitchen, Study Room, Store room, Bathroom, Utility space, Staircase and Verandah.</p> <p><b>Practical:</b> Planning layout for different areas in interiors.</p>	10	Lecturing PowerPoint Seminar

**Learning Outcome Based Education & Assessment (LOBE)  
Formative Examination - Blue Print  
Articulation Mapping – K Levels with Course Outcomes (COs)**

Internal	Cos	K Level	Section A	
			MCQs	
			No. of. Questions	K - Level
CI	CO1	K1 – K2	25	K1,K2
AI	CO2	K1 – K2	25	K1,K2
CI	CO3	K1 – K2	25	K1,K2
AII	CO4	K1 – K2	25	K1,K2
Question Pattern CIA I & II		No. of Questions to be asked	50	
		No. of Questions to be answered	50	
		Marks for each question	1	
		Total Marks for each section	50	

\* Two Formative examinations will be conducted as a part of Continuous Internal Assessment under which, 50 MCQ's will be asked [50X1=50 marks] from any 4 CO's. (I<sup>st</sup> Test-2 CO's & II<sup>nd</sup> Test-2 CO's) in equal weightage

Distribution of Marks with K Level CIA I & CIA II					
	K Level	Section A (Multiple Choice Questions)	Total Marks	% of (Marks without choice)	Consolidate of %
CIA I	K1	30	30	60	100
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100
CIA II	K1	30	30	60	100
	K2	20	20	40	
	K3				
	K4				
	Marks	50	50	100	100

**K1-** Remembering and recalling facts with specific answers

**K2-** Basic understanding of facts and stating main ideas with general answers

**K3-** Application oriented- Solving Problems

**K4-** Examining, analyzing, presentation and make inferences with evidences

**CO5** will be allotted for individual Assignment which carries five marks as part of CIA component.

Summative Examination – Blue Print Articulation Mapping – K Level with Course Outcomes (COs)				
S. No	COs	K - Level	Section A (MCQs)	
			No. of Questions	K – Level
1	CO1	K1-K2	15	K1,K2
2	CO2	K1-K2	15	K1,K2
3	CO3	K1-K2	15	K1,K2
4	CO4	K1-K2	15	K1,K2
5	CO5	K1-K2	15	K1,K2
No. of Questions to be Asked			75	
No. of Questions to be answered			75	
Marks for each question			1	
Total Marks for each section			75	
(Figures in parenthesis denotes, questions should be asked with the given K level)				

In summative examinations, 75 MCQ's will be asked [75X1=75 marks] from all 5 CO's in equal weightage.

Distribution of Marks with K Level				
K Level	Section A (Multiple Choice Questions)	Total Marks	% of (Marks without choice)	Consolidated %
K1	40	40	53	100
K2	35	35	47	
K3				
K4				
Marks		75	100	100
<b>NB: Higher level of performance of the students is to be assessed by attempting higher level of K levels.</b>				