MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI – 627012

B.Sc. Food Science and Nutrition Degree

(CHOICE BASED CREDIT SYSTEM)

Learning Outcome Based Curriculum

Major & Allied Food Science and Nutrition

(Effective from the academic year 2021-2022 onwards)

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

UG COURSES – AFFILIATED COLLEGES

B.Sc. FOOD SCIENCE AND NUTRITION

(Choice Based Credit System)

(Effective from the academic year 2021-2022 onwards)

1. Vision of the University

"To provide quality education to reach the un-reached"

2. Mission of the University

- To conduct research, teaching and outreach programmes to improve conditions of human living
- To create an academic environment that honours women and men of all races, caste, creed, cultures and an atmosphere that values intellectual curiosity, pursuit of knowledge, academic freedom and integrity
- To offer a wide variety of off-campus educational and training programs, including the use of information technology, to individuals and groups.
- To develop partnership with industries and government so as to improve the quality of the workplace and to serve as catalyst for economic and cultural development
- To provide quality / inclusive education, especially for the rural and un-reached segments of economically downtrodden students including women, socially oppressed and differently abled

3. Vision of the Department

To empower students to become lifelong learners by providing a comprehensive education in Food Science and Nutrition. Inspiring students in professional excellence, Research and extension. Creating a leader to serve in the global community.

4. Mission of the Department

- To create progressive, educational experiences that enable learners to be knowledgeable, skillful and competent in Food Science and Nutrition professionals.
- To pursue, excel and maintain a leadership role in the guest of knowledge by way of quality research, capacity building, consultancy and innovative.
- To educate and inspire students to become passionate healers who demonstrate integrity, caring and excellence.

5. Preamble

Food Science and Nutrition is a multi-disciplinary field involving chemistry, biochemistry, nutrition, microbiology and engineering to give the scientific knowledge to solve real problems associated with many facts of the food system. The B.Sc. Degree programme aims at providing in-depth knowledge and understanding of Food and Health and their practical aspects in order to pursue higher studies and employment. The Learning Outcome Based Curriculum Framework (LOCF) for B.Sc. Food Science and Nutrition programme has been framed as per the guidelines prescribed by University Grants Commission (UGC) under Choice Based Credit System (CBCS).

Programme Structure

6. Programme Educational Objective(PEOs)

The B.Sc Food Science and Nutrition proposed to

PEO1: The curriculum offers robust academic and experiential opportunities across the health spectrum to address the health of individuals and populations from prevention to palliation.

PEO2: To divulge theoretical understanding and practical skills that reinforces the various arenas of Food Science and Nutrition.

PEO3: The course is aimed to enable students to gain knowledge about interaction between food, body and health under normal and special circumstances.

PEO4: This course will enable students to use current information technologies to locate and apply evidence-based guidelines and protocols and get imparted with critical thinking to take leadership roles in fields of health, dietetics, special nutritional needs and nutritional counseling. Currently food industry is shifting its focus from taste to nutrition.

PEO5: To apply the skills and knowledge gained through the subject to real life situations and face competitive examinations with self-confidence at National level.

7. Programme Outcomes (POS)

The students graduating with the Degree B.Sc will be able to:

PO 1: Disciplinary Knowledge

- Discover scientific knowledge and understanding of basic concepts and principles.

PO 2: Creative Thinking and Practical Skills / Problem Solving Skills

Develope problem-solving competencies in life skills

- Apply problem-solving competencies in life skills to draw logical inferences from scientific experiments/ programming and skills of creative thinking to develop novel ideas.

- Discover professional and entrepreneurial skills for Economic empowerment of self and community

PO 3: Sense of inquiry and Skill development

- Connect professional skills in food and nutrition, textile Science, housing, product making, communication technologies and human development and to plan, execute and express the results of experiments / investigations
- Correlate the scientific innovations from lab to the society

PO 4: Ethical Awareness / Team Work

- Appraise them for conducting work as an individual / as a member, or as a leader to ensure academic integrity.
- Prioritize the team work for the well-being of future generation.

PO 5: Usage of Science and Technology in Empowering Individuals

- Invent the application of science and technologies to improve the quality of life of the individuals

8. Programme Specific Outcomes (PSO)

PSO	Upon completion of B.Sc. Food Science & Nutrition Degree Programme, the students will be able to:	PLOs Mapped
PSO - 1	Understand the fundamental concepts and principles relating food science and nutrition.	PLO-1
PSO - 2	Acquire practical skills in food industries, hospitals and textile industries	PLO-2
PSO - 3	Examine and develop skills in food and nutrition, dietetics, textiles Science, housing, extension education and product making.	PLO-3
PSO - 4	Mark entrepreneurial skills in small and medium Enterprises	PLO-4
PSO - 5	Build knowledge in emerging areas and to enhance necessary aptitude and confidence to become professionals in various fields	PLO-5

9. Eligibility for admission to the course and examination

- The minimum eligibility conditions for the admission to **B.Sc Food Science and Nutrition** program are given below.
- The candidates seek admission for **B.Sc Food Science and Nutrition** course will required to have qualified the Higher Secondary Examination conducted by the Board of Higher Secondary Education, Government of Tamilnadu or any other Examinations accepted by the Manonmaniam Sundaranar University as equivalent there to in Science subject. The candidate should have completed Higher Secondary with any of the three combinations of subjects Physics/ Chemistry/ Biology/ Home Science/ Mathematics/ Computer Science.

10. Duration of the Course

- The students shall undergo the prescribed course of study for a period of not less than three academic years (Six semesters). Each semester contains 90 working days.

11. Medium of instruction and examination

The medium of instruction as well as examination will be in English.

12. Theory examination

The external evaluation will be based on the examination to be conducted by the university at the end of each semester.

13. Practical examination

Practical examinations will be conducted at the end of each semester.

14. Evaluation

A. Each paper carries an internal component

B. There is a pass minimum of 40% for external and overall components

Theory External: Internal Assessment = 75:25
Practical External: Internal Assessment = 50:50

C. Internal Assessment

Internal marks for Theory shall be allocated in the following manner.

The average of the best two tests from three compulsory tests	20 Marks
Assignment	05 Marks
Total	**25 Marks**

Note: Each test will be of one hour duration.

D. Practical

Internal marks for Practical shall be allotted in the following manner.

Experimental work	20 Marks
Record	10 Marks
Model Test	20 Marks
Total	**50 Marks**

E. Project Work

Components	Marks
Project Report	75 Marks
Viva -Voce	25 Marks
Total	**100 Marks**

Note:

i) Students should carry out group project in major subject.

ii) Project report will be evaluated by Central valuation and Viva-Voce will be conducted by both External examiner and the Guide at the end of the 6th semester.

15. Grading System

The performance of the student is indicated by the Seven Points Scale Grading System as per the UGC norms given below

Grade	**Grade point**	**Percentage of marks**	**Performance**
O	9.5 and above	95-100	Outstanding
E	8.5 and above	85-94	Excellent
D	7.5 and above	75-84	Distinction
A	7 and above	70-74	Very Good
B	6 and above	60-69	Good
C	5 and above	50-59	Average
RA	0	Up to 49	Re-Appear

F. The overall performance level of the candidates will be assessed by the following formulae:

Cumulative weighted average of marks = $\frac{\sum(\text{marks} + \text{credits})}{\sum \text{credits}}$

Cumulative weighted average grade points = $\frac{\sum(\text{Grade points} \times \text{credits})}{\sum \text{credits}}$

16. The question paper pattern for all theory papers shall be as follows.

Duration of Exam: 3Hours

Section	Type of questions	Mark
Part-A	Multiple choice question (Two question from each unit compulsory)	1×10=10 Marks
Part-B	Internal Choice questions (One question from each unit: either/or)	5×5=25 marks
Part-C	Internal Choice questions (One question from each unit: either/or)	8×5=40 marks
	Total	**75 Marks**

17. The question paper pattern for all practical papers shall be as follows.

Duration of Practical Exam: 3 hours

1	Experimental Work	25 Marks
2	Regularity	15 Marks
3	Record	10 Marks
	Total	**50 Marks**

Model Question Paper

Essentials of Micronutrients

Time: Three hours **Maximum: 75 marks**

10 × 1 = 10 marks

Answer ALL questions.

Choose the correct answer:

PART A

1. A deficiency of vitamin D may result in which disease
   a) Rickets b) beriberi c) Scurvy d) pellagra
2. Which two minerals are the major constituents of bone?
   a) Calcium and zinc b) Phosphorous and calcium
   c) Sodium and magnesium d) Selenium and calcium
3. Iodine deficiency in pregnant women leads to irreversible mental and Physical retardation of infants knows as

a) Cretinism b) goiter c) Anaemia d) kwashiorkor

4. Which vitamin is present only in foods of animal origin?
   a) Beta carotene b) vitamin B12 c) Riboflaxin d) ascorbic acid
5. Which food is present in rich amount of ascorbic acid?
   a) Amla b) apple c) orange d) grapes
6. Which food is present in phytate phosphorous?
   a) Pulses b) meat c) milk d) fish
7. Thiamine functions as
   a) ADT b) ADP c) TPP d) NAD
8. Cracks at the corner of the lips is
   a)Beriberi b) Cheilosis c) Glossitis d)None
9. Cyanocobalamine is otherwise
   a) B6 b) B2 c) B4 d) B1
10. Flourine is essential for
   a)Skin b)Teeth c) Hair d) Tongue

PART B

Answer ALL questions, choosing either (a) or (b)

5 × 5 = 25 Marks

11. a) Assessing vitamin A visual cycle

OR

b)Describe the functions and deficiency of vitamin K

12. a) Enumerate the functions of trace elements

OR

b) Outline the functions of water

13. a) Explain the deficiency and functions of thiamine and riboflavin

OR

b) Discuss on water intoxication

14. a) write about the vitamin E under the following headings
   - function
   - deficiency
   - RDA and sources

OR

b) Discuss the enzymatic action in foods

15.a) Interpret Factors affecting BMR

OR

b) Analyzing the importance of Energy

PART - C

Answer ALL questions, choosing either (a) or (b),

5 × 8 = 40 marks

16. a) Bring out the role of fat soluble vitamins in health

OR

b) Explain the mechanism involved in maintenance of water balance in body effect of failure in maintenance of water balance

17. a) Bring out the effects of deficiency of vitamin D..

OR

b) Illustrate the functions, deficiency and sources of vitamin C.

18. a)Write the role of enzymes in health

OR

b) Brief enumerate on Enzymes .

19. a) Analyzing and explain about the copper?

OR

b) Enumerate the functions, effects of deficiency and requirement of iron?

20. a)Illustrate differentiate between two different caloric method.

OR

b) Evaluating the steps involved in Direct Calorie method?

Part I/II/III/IV/V	Sub. No	Subject Status	Subject Title	Contact hrs/ week	L hrs/ week	T hrs/ week	P hrs/ week	C Credits
Semester – III								
I	17	Language	Tamil/Other Languages	6	6	0	0	4
II	18	Language	English	6	6	0	0	4
III	19	Core-3	Essentials of Macro Nutrients	4	4	0	0	4
III	20	Major Practical – 3	Essentials of Macro Nutrients	2	0	0	2	2
III	21	Allied II - 1	Family Resources Management - I	4	2	0	0	3
III	22	Allied II - Practical 1	Family Resources Management - I	2	0	0	2	2
III	23	Skill Based Subject	Food Processing and Preservation	4	4	0	0	4
IV	24	Non-Major Elective	Food Preservation Techniques / Diet Therapy I	2	2	0	0	2
IV	25	Common	Yoga*	2	2	0	0	2
			Subtotal	**30+2**	**24+2**	**0**	**4**	**27**
Semester – IV								
I	26	Language	Tamil/Other Languages	6	6	0	0	4
II	27	Language	English	6	6	0	0	4
III	28	Core-4	Essentials of Micro Nutrients	4	4	0	0	4
III	29	Major Practical – 4	Essentials of Micro Nutrients	2	0	0	2	2
III	30	Allied II - 2	Family Resources Management II	4	2	0	0	3
III	31	Allied II - Practical 2	Family Resources Management II	2	0	0	2	2
III	32	Skill Based Subject	Nutrition and Health Communication	4	4	0	0	4
IV	33	Non-Major Elective	Bakery / Diet Therapy II	2	2	0	0	2
IV	34	Common	Computers for Digital Era	2	2	0	0	2
V	35	Extension Activity	NCC/NSS/YRC/YWF	-	-	-	-	1
			Subtotal	**30+2**	**24+2**	**0**	**4**	**27+1**

MSU/2021-2022/UG-Colleges/Part- III (B.Sc. Food Science &Nutrition) Semester-III/ Core

ESSENTIALS OF MACRO NUTRIENTS

Objectives: **LTPC 4004**

1. To understand the role of nutrition in the maintenance of good health.
2. To study nutritional deficiencies and their prevention.

Unit I Basic concepts of Nutrition

Relation of good nutrition to normal physical development and sound health, The process of digestion, absorption, transport and utilization of carbohydrate, lipids, proteins, and water in human body

Unit II Carbohydrates

Introduction, Functions, Classification, Food sources, the chemical structure of carbohydrate, Dietary fiber, Functions of dietary fiber, Side effects of dietary fiber, Recommended intake, Glycemic Index, RDA of carbohydrate Consequences of inadequate and excessive intakes, Metabolism of carbohydrates – Glycolysis, TCA Cycle,Gluconeogenesis, Glycogenesis, Glycogenolysis.

Unit III Protein

The basic structure of protein. The composition of protein, Classifications of protein, Functions and food sources, classifications of amino acid, Different types of amino acid - essential and non-essential amino acids. Protein Metabolism – Protein turn over, deamination, transamination trans deamination and Urea cycle, RDA of protein Consequences of inadequate intake PEM (Kwashiorkor, Marasmus) and excessive intakes.

Unit IV Fats (Lipids)

The chemical structure of lipids, Classifications, functions of food sources, Fat Metabolism- Synthesis of fat, beta oxidation of fatty acid, synthesis of fatty acid, RDA of fat Consequences of inadequate and excessive intakes

Unit V Energy

Definition, energy needs of the body, BMR, factors affecting BMR, Determination of energy value of food - Bomb calorimetric method, Determination of energy requirements– Direct calorimeter and indirect calorimeter method,

Specific Dynamic Action, determination of energy metabolism during work.

References:

1. Swaminathan, M.Advanced Text Book on Food and Nutrition, BAPPCO, 1985.
2. ShakuntalaManay, N. and M.Shadaksharaswamy, Foods Facts and Principles, NewAge International(P)Ltd.Publishers,SecondEdition,2001.
3. SeemaYadav ,Basic Principles of Nutrition, Anmol Publication Pvt.Ltd., First Edition, 1997.
4. Robinson,C.H. andLawler,R.M., Normal and Therapeutic Nutrition, 17th edition Maxmillan Publication& Co., NewYork, 1994.
5. SriLakshmi, B., Dietetics, New Age International Private Ltd., New Delhi, 1995
6. Mahtab,S.Bamji,PralhabRao,RandVinodhini,Text Book of Human Nutrition, Oxford and IBHPublishingCo.Pvt.Ltd., NewDelhi,1996.

Course Outcomes

On completion of the course, the students will be able to

CO. No	Core - Essentials of Macro Nutrients Course Outcomes	Cognitive level
CO-1	Explain the basic concepts of Nutrition	K2 - Understanding
CO-2	Identify the chemical structure and properties of carbohydrates	K3 - Applying
CO-3	Examine the structure and enzymatic reactions of proteins in food	K4 - Analyzing
CO-4	Assess the functional role of lipids in food.	K5 - Evaluating
CO-5	Create the various methods of energy determination.	K6 - Creating

Mapping

Core - Essentials of Macro Nutrients											
CO	**PO**					**PSO**					
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**
1	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**
2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**2**
3	**3**	**3**	**3**	**3**	**1**	**3**	**3**	**2**	**3**	**3**	**2**
4	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**1**	**3**	**3**	**1**
5	**3**	**3**	**3**	**3**	**1**	**3**	**3**	**2**	**3**	**3**	**2**

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/2021-2022/UG-Colleges/Part-III (B.Sc. Food Science & Nutrition)Semester III/ /Major Practical- III

Objectives

1. Evaluate the nutrient qualitatively and quantitatively

ESSENTIALS OF MACRO NUTRIENTS

a) Qualitative test for carbohydrates, Proteins, Fats and Oils

b) Quantitative estimation of reducing sugar in Fruit Juices, reducing sugar in honey

c) Quantitative estimation of Proteins, Fats in foods.

Course Outcomes

On completion of the course, the students will be able to

CO. No	Course Outcomes	Cognitive level
CO-1	Acquire skills to analyse various nutrients	**K2 - Understanding**

CO-2	Competence to use various equipment's for the analysis of nutrients.	**K3 - Applying**
CO-3	Perform qualitative analysis of carbohydrates, Proteins, Fats and Oils	**K4 - Analyzing**
CO-4	Estimate the presence of reducing sugar in fruit juices	**K5 - Evaluating**
CO-5	Estimate the presence of Proteins, Fats in foods	**K6 - Creating**

Mapping

ESSENTIALS OF MACRO NUTRIENTS											
CO	**PO**					**PSO**					
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**
1	**3**	**3**	**3**	**3**	**1**	**3**	**3**	**3**	**3**	**3**	**3**
2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**3**	**2**
3	**3**	**3**	**2**	**3**	**1**	**3**	**3**	**2**	**3**	**3**	**2**
4	**3**	**3**	**1**	**3**	**2**	**3**	**3**	**1**	**2**	**3**	**1**
5	**3**	**3**	**3**	**3**	**1**	**3**	**3**	**2**	**3**	**3**	**2**

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/2021-2022/UG-Colleges/Part-III (B.Sc.FoodScience&Nutrition)SemesterIII/Allied

FAMILY RESOURCE MANAGEMENT –I

Objective **LTPC2203**

1. To attain a thorough knowledge of understanding values and goals in house keeping
2. To gain a basic knowledge of planning and constructing a house
3. To understand the basic Principles and elements of design

Unit I

Housing **(6L + 6 T)**

Functions of the house and its environment, House planning– sites election, factors to be considered, features of a house contributing to livability, orientation, grouping, roominess, lighting and ventilation, storage facility, privacy, flexibility, sanitation and economy, Kitchen planning–different types–work triangle, House plans–low, middle and high income groups

Unit II Care and maintenance of house

Care and maintenance of house and its surroundings, daily, weekly and periodical cleaning to keep the house in good condition. Insect and pest control–preventive and remedial measures to be adopted.

Unit III Elements of design

Elements of design, - line, form, texture colour types of design, characteristics of a good design, principles of design. Harmony–meaning, types–repetition, contrast, transition, Proportion–meaning–means of obtaining good proportion, Balance–meaning–types and means of obtaining balance, Emphasis–meaning–means of creating emphasis, Rhythm–meaning–means of getting rhythm. Elements of Design

Unit IV Colour

Qualities of colour–hue, value, intensity of colours and emotions, advancing and receding colours.

How to use colours–proportion, balance, harmony and rhythm , Use of colour in interior decoration

Unit V Accessories, Furniture, Flower Arrangement

Selection, use and care of accessories, Picture and wall hangings, Selection and Use of Furniture–living room, bed room and dining room–table setting. Basic knowledge of flower arrangements –principles, types of flower arrangement

References

1. DeshPande, R.S.,Modern Ideal Homes for India–United Book Corporations, Poone. 1971.
2. StellaSoundararaj.A Textbook of Household Arts, Orient Longmans, Bombay, 1968.
3.MargaretKaye.A. AStudents hand book of Housewifery, J.M.DentSons Ltd., London. 1986.
4.PaulenaNickell, Jean MuirDorsey,Management in Family Living Wiley Eastern Private Ltd., 1976.
5Varghese A. Home Management New Age International, 1985.

Course Outcomes
On completion of the course, the students will be able to

CO. No	Course Outcomes	Cognitive level
CO-1	Understand efficient management skills with good managerial potentials and Identify human and non-human resources for efficient management of the family	K2 - Understanding
CO-2	Face challenges put forth by recent trends in availability of resources	K3 - Applying
CO-3	Identify elements needed for appropriate designing to achieve required visual effect	K4 - Analyzing
CO-4	Apply theme based color harmonies in interiors.	K5 - Evaluating
CO-5	Analyze type of lighting and the lighting requirements for various rooms.	K6 - Creating

Mapping

FAMILY RESOURCEMANAGEMENT –I											
CO	**PO**					**PSO**					
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**
1	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**
2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**2**
3	**3**	**3**	**3**	**3**	**1**	**3**	**3**	**2**	**3**	**3**	**2**
4	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**1**	**3**	**3**	**1**

5	**3**	**3**	**3**	**3**	**1**	**3**	**3**	**2**	**3**	**3**	**2**

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/2021-2022/UG-Colleges/Part-III(B.Sc. FoodScience&Nutrition)SemesterIII/ /Allied Practical- III

Objectives

1. Learn how to efficiently arrange space in interiors and apply the design fundamentals effectively in an interior design setting

FAMILYRESOURCEMANAGEMENT–I

Draw the kitchen plan and house plan for various income groups.

Visit to hotels to obtain knowledge on interior decoration and housekeeping

Demonstration on different designs and mixing color

Visit to Artificial and fresh flower company

Demonstration on different types of flower arrangement, wall hangings, picture mounting

Preparation of time plan for college girl /homemaker and its evaluation.

Determination of working height in vertical and horizontal planes

Study on different types of furniture and its sizes.

Planning, organizing, implementing and evaluating a group activity (Party/Exhibition/tour)

Course Outcomes

On completion of the course, the students will be able to

CO. No	Course Outcomes	Cognitive level
CO-1	Understand and draw house plan for various income groups.	K2 - Understanding
CO-2	Demonstrate on different designs and mixing colors	K3 - Applying
CO-3	Experiment with wall hangings and picture mounting	K4 - Analyzing
CO-4	Construct different group activity (Party/Exhibition/tour)	K5 - Evaluating
CO-5	Create various types of flower arrangements.	K6 - Creating

Mapping

Allied Practical- III FAMILYRESOURCEMANAGEMENT–I											
CO	**PO**					**PSO**					
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**
1	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**
2	**3**	**3**	**2**	**2**	**2**	**3**	**2**	**2**	**3**	**3**	**2**
3	**3**	**3**	**2**	**2**	**1**	**3**	**3**	**2**	**3**	**3**	**2**
4	**3**	**3**	**2**	**2**	**2**	**3**	**2**	**1**	**3**	**3**	**1**
5	**3**	**3**	**2**	**2**	**1**	**3**	**3**	**2**	**3**	**3**	**2**

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/2021-2022/UG-Colleges/Part III (B.Sc Food Science & Nutrition) Semester III/ Skill based Core-I

FOOD PROCESSING AND PRESERVATION

Objectives **LTPC4004**

1. To understand the principles of food preservation

2. To develop skills for setting up production units

3. To acquire Knowledge of preservation techniques

Unit I

Objectives , scope, and principles of Food Preservation, Food Preservation: Traditional and Modern Techniques.**(10L)**

Unit II

Low Temperature- Refrigeration, Freezing, Freeze Drying. Hazard Analysis and thaw indicators , High Temperature–Blanching, Canning, Dehydration, Drying. Principles of thermal destruction of spoilage microorganisms. **(14L)**

Unit III

High concentration of Sugar- Jam, Jelly, Murabba, preserves, squash and crush, High concentration of salt- Principles of pickling and methods.**(13L)**

Unit IV

Preservation by use of chemicals–Class I Preservatives, Class II Preservatives. Preservation by radiation - Ultraviolet irradiation/ ionizing radiations/gamma , Rays and cathode rays/ microwave processing **(12L)**

Unit V (11L)

Food Additives - Definition, functional characters of chemical additives, Intentional Food additives- Acids, Bases and their salt, Antioxidants, Bleaching and maturing agents, leavening agents, clarifying agents, Anticaking agents.

References

1. Prakash Triveni, Food Preservation, Aadi publication, Delhi.2008.
2. ShafiurRahman.M.HandBookOfFoodPreservation,MarcelDekkerInc,NewYork.2007.
3. McWilliamsandPaine,ModernFoodPreservation,SurjeetPublication.1996.
4. Fellows,PandEllisH.FoodProcessingTechnology:PrincipalandPracticals,NewYork.1990.
5. NPCS Board, Modern Technology on Food Preservation Second Edition, Asia Pacific Business Press, Inc 2012.
6. Sivasankar;B.FoodProcessingandPreservation,PrenticeHall,IndiaLearningPrivateLimited2004.
7. Tanchev & Stoyan. Methods of Food Preservation. Food Safety: A Practical and Case Study Approach .2007.

Course Outcomes

On completion of the course, the students will be able to

CO. No	Course Outcomes	Cognitive level
CO-1	Prioritize the importance and principles of food preservation.	K2 - Understanding
CO-2	Understand the method of food preservation by using sugar	K2 - Understanding
CO-3	Formulate the preservation of foods in low temperature	K3 - Applying
CO-4	Interpret the use of chemical preservatives and fermentation technology	K5 - Evaluating
CO-5	Discover the characters of chemical additives in foods.	K6 - Creating

Mapping

FOODPROCESSINGANDPRESERVATION											
CO	**PO**					**PSO**					
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**
1	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**2**
2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**3**
3	**3**	**3**	**3**	**1**	**2**	**3**	**3**	**2**	**2**	**2**	**3**
4	**3**	**3**	**3**	**1**	**2**	**3**	**3**	**2**	**2**	**2**	**2**
5	**3**	**3**	**3**	**3**	**1**	**3**	**3**	**2**	**3**	**3**	**2**

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/2021- 2022/UGcolleges/PartIII(B.Sc.FoodScience&Nutrition)SemesterIII/Non-MajorElective-I

FOOD PRESERVATION TECHNIQUES

ObjectivesLTPC

1.To understand the principles of food preservation

2. To develop skills for setting up production units

3.To acquire Knowledge of preservation techniques.

Unit I(6L)

Objectives and principles of food preservation.

Unit II

Low temperature-refrigeration, freezing, High temperature–canning, dehydration, drying.

Unit III(6L)

Preservation by use of chemicals–preparation of crush, squashes, synthetic syrup

Unit IV(6L)

Preservation by use of sugar–Jam, Jelly, Marmalade, Tuty-fruity

Unit–V(5L)

Pickling– Principles and methods.

References

1.Prakash Triveni, Food Preservation, Aadipublication, Delhi.2008.

2.ShafiurRahman.M. Hand Book of Food Preservation, Marcel Dekker Inc, NewYork.2007.

3.McWilliamsandPaine, Modern Food Preservation, Surjeet Publication. 1996.

4.Fellows, P and Ellis Food Processing Technology: Principal and Practicals, NewYork. 1990.

4.NPCS Board, Modern Technology on Food Preservation Second Edition, Asia PacificBusiness Press, Inc2012.

5.Siva sankar; B. Food Processing and Preservation, Prentice Hall, IndiaLearning Private Limited 2004.

6.Tanchev, & Stoyan. Methods of Food Preservation. Food Safety: A Practical and Case Study Approach. 2007.

Course Outcomes

On completion of the course, the students will be able to

CO. No	Course Outcomes	Cognitive level
CO-1	Make use of various seasonal fruits for making jams.	K2 - Understanding
CO-2	Construct various methods for preparing fruit jellies.	K3 - Applying
CO-3	Develop methods of preparing natural beverages.	K4 - Analyzing
CO-4	Show the techniques of making pickles.	K5 - Evaluating
CO-5	Formulate fruit preserves, sauces and ketchups, popsicles & ice creams.	K6 - Creating

Mapping

FOOD PRESERVATION TECHNIQUES											
CO	**PO**					**PSO**					
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**
1	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**
2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**2**
3	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**
4	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**2**
5	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/2021-2022/UG colleges / Part IV (B.Sc. Food Science & Nutrition) Semester III /Non-Major Elective

DIET THERAPY –I

Objectives LTPC2002

1. To understand the knowledge of nutrition science to human health across the life span.

Unit I

Menu planning- Definition, Principles of Menu planning, Nutrition during pregnancy – Nutritional Requirements, Food Requirements, Dietary Problems, Complications, Nutrition during lactation - Nutritional Requirements, Food Requirements, roll of hormones. **(6L)**

Unit II

Nutrition during infancy- Growth and Development, Nutritional Requirements, Food Requirements,Weaning. Nutrition for preschoolers- Nutritional Requirements, Food Requirements, Nutrition related Problems, Nutrition for school going children - Nutritional Requirements, Food Requirements, Packed Lunch **(7L)**

Unit III

Nutrition during adolescents- Nutritional Requirements, Food Requirements, Nutritional related Problems. Nutrition during adulthood - Nutritional Requirements, Food Requirements. Nutrition during old age- Nutritional Requirements, Food Requirements, Nutritional related Problems. **(6L)**

Unit IV

Principles of therapeutics diet – special feeding methods, pre and post-operative diet., Modification of normal diets- Clear fluid diet, full fluid diet, semi solid diet, solid diet. **(6L)**

Unit V Deficiency disorders(5L)

Nutrition for deficiency disorders –PEM,- Anemia and Vitamin A deficiency - causes, symptoms

References

1.Sri Lakshmi, Dietetics, NewDelhi,2019.

2.Corrine Robinson andLawler.NormalandTherapeuticNutrition,OxfordandIBHpublishers.1990

3.Swaminathan.M. Principles of Nutrition and Dietetics, BAPPCO publishers, Bangalore. 2003

4.Gopalan, Balasubramainan and Ramasastri., Nutritive value of Indian foods, IN publication, Hyderabad 20

5. BhavanaSabarwal .Principles and practices of Dietetics, Ajay Verma Common Wealth Publishers, NewDelhi.1999.

6. Davids on Pass more .Human Nutrition and Dietetics, London Churchill

Course Outcomes

On completion of the course, the students will be able to

CO. No	Course Outcomes	Cognitive level
CO-1	Understanding the basis of menu planning.	K2 - Understanding
CO-2	Analyze the nutritional requirements for infants and preschool children.	K3 - Applying
CO-3	Demonstrate the ability to plan and manage the dietary needs for adulthood and adolescents	K4 - Analyzing
CO-4	Evaluate the ability to educate and inform about Therapeutic diets.	K5 - Evaluating
CO-5	Estimate the effects of vitamin deficiency	K6 - Creating

Mapping

DIET THERAPY –I											
CO	**PO**					**PSO**					
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**
1	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**
2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**2**
3	**3**	**3**	**2**	**2**	**1**	**3**	**3**	**2**	**3**	**2**	**2**
4	**3**	**3**	**2**	**2**	**1**	**3**	**3**	**1**	**2**		**1**
5	**3**	**3**	**2**	**2**	**1**	**3**	**2**	**2**	**3**	**3**	**2**

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/2021-2022/UG colleges/Part III (B.Sc. Food Science & Nutrition) Semester IV/Core

ESSENTIALS OF MICRONUTRIENTS

Objectives **LTPC**

To understand the role of nutrition in the maintenance of good health.

To study nutritional deficiencies and their prevention.

Identify micronutrients and the related chemical or environmental plant deficiencies.

Unit I Vitamins

Introduction of vitamins, History, Chemistry, Classification, Absorption, Functions, requirements, sources, Effects of deficiency and toxicity, Water soluble vitamins-B1,B2,B3,B5,B6,B7,B9,B12&Vit-C, Fat soluble vitamins-A,D,E&K.

Unit II Major Minerals

Introduction of Macro minerals- Na, K, Ca, Mg, P, Su, Functions and Food Sources of Macro minerals, RDA and Health consequences on deficiency and toxicity of any mineral in the human body.

Unit IIITrace Elements

Introduction of Trace elements - Fe, I, F, Zn, Cu, Co, Se, Mn, Mo, Functions and Food Sources of Micro minerals. RDA and Health consequences on deficiency and toxicity.

Unit IV Inter relationship between nutrients and water balance

Interrelationship between carbohydrates, proteins, fat, vitamins and minerals, Water balance – Importance of water in human body, Components of body fluid, Dehydration and over hydration.

Unit V Enzymes

Enzymes – Classification, Mechanism of reaction, factors affecting enzyme action. Co Enzymes – Types and Mechanism of Action.

References:

1.Swaminathan, M. AdvancedText-BookonFoodandNutrition, BAPPCO,1985.

2.ShakuntalaManay, N.andM. Shadaksharaswamy,FoodsFactsandPrinciples, Newage International(P)Ltd.Publishers, SecondEdition,2001.

3.SeemaYadav,BasicPrinciplesofNutrition, AnmolPublicationPvt.Ltd., FirstEdition,1997.

4.Robinson,C.H. andLawler,R.M.,NormalandTherapeuticNutrition,17th edition,MaxmillanPublication& Co.,NewYork,1994.

5. SriLakshmi, B., Dietetics,NewAgeInternationalPrivateLtd., NewDelhi,1995.

6.Mahtab, S. Bamji,PralhabRao,RandVinodhini,TextBookofHumanNutrition, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi,1996.

Course Outcomes

On completion of the course, the students will be able to

CO. No	Course Outcomes	Cognitive level
CO-1	Discuss the functions, sources and requirements of vitamins.	K2 - Understanding
CO-2	Summarize the types and role of minerals.	K3 - Applying
CO-3	Inspect the Health consequences on deficiency and toxicity of Trace Elements.	K4 - Analyzing
CO-4	Conclude the importance of Inter relationship between nutrients and water balance.	K5 - Evaluating
CO-5	Utilize the need for the essential role of enzymes.	K6 - Creating

Mapping

ESSENTIALS OF MICRONUTRIENTS											
CO	**PO**					**PSO**					
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**
1	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**
2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**2**	**3**
3	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**2**	**2**
4	**3**	**3**	**3**	**3**	**1**	**3**	**3**	**3**	**2**	**3**	**3**
5	**3**	**3**	**3**	**3**	**1**	**3**	**3**	**2**	**2**	**3**	**1**

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/2021-2022/UGcolleges/PartIII(B.Sc.FoodScience&Nutrition)Semester-IV /Major practical- IV

ESSENTIALS OF MICRONUTRIENTS- Practical

a) Qualitative test for Minerals

b) Quantitative estimation of Vitamin C in Greens, lime juice and green chili

c) Quantitative estimation of Phosphorous, Iron, Calcium

References

1.Swaminathan, M.AdvancedTextBookonFoodandNutrition, BAPPCO,1985.

2.ShakuntalaManay, N.andM. Shadaksharaswamy, FoodsFactsandPrinciples, Newage International (P) Ltd. Publishers, Second Edition,2001.

3.SeemaYadav,BasicPrinciplesofNutrition, AnmolPublicationPvt.Ltd., FirstEdition,1997.

4.Robinson,C.H.andLawler,R.M.,NormalandTherapeuticNutrition,17th edition,MaxmillanPublication & Co.,NewYork,1994.

Course Outcomes

On completion of the course, the students will be able to

CO. No	Course Outcomes	Cognitive level
CO-1	Understand the chemical process analysing micronutrients	K2 - Understanding
CO-2	Estimate the presence of calcium in milk	K3 - Applying
CO-3	Analyse the presence of phosphorus in foods	K4 - Analyzing
CO-4	Deduct the quantity of vitamin C present in greens, lime juice and green chillies.	K5 - Evaluating
CO-5	Interpret the presence of Iron in foods.	K6 - Creating

Mapping

ESSENTIALS OF MICRONUTRIENTS- Practical											
CO	**PO**					**PSO**					
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**
1	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**
2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**2**
3	**3**	**3**	**3**	**3**	**1**	**3**	**3**	**1**	**2**	**2**	**1**
4	**3**	**2**	**2**	**2**	**2**	**3**	**3**	**1**	**2**	**2**	**1**
5	**3**	**2**	**2**	**2**	**1**	**3**	**3**	**1**	**2**	**2**	**1**

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/2021-2022/UGcolleges/PartIII(B.Sc.FoodScience&Nutrition)SemesterIV/Allied-IV

FAMILY RESOURCE MANAGEMENT–II

Objectives **LTPC2203**

1. To enable the students to understand the importance of home management in family and personal living

2. To improve their ability in family resource management.

3.To understand and apply the basic principles of art in interior designing.

Unit I Management

Definition and meaning of management–characteristics of a good homemaker- management process–

planning, organizing, controlling and evaluating, Motivating factors in management–values, goals and standards. Decision making–steps in decision making **(6L+6T)**

Unit II RESOURCES

Resources–classification and characteristics, Standard of Living –factors affecting, causes for low living standards in India, law of diminishing marginal utility

Unit III Time and Energy Management

Time and Energy Management–Importance of time management, guidelines in planning time schedule, fatigue-types and overcoming fatigue., Work simplification- Definition, Mundels Law. **(5L+5T)**

Unit IV Money Management

Family Income–types, sources and methods of augmenting family income, Family expenditure – budget – meaning – types of budget-planning a family budget –steps in planning, advantages of budgeting– Engel's law of consumption.

Savings–meaning–need, saving institutions–Bank–Post office–Insurance–Chit fund–Mutual fund . **(6L+6T)**

Unit V Consumer Rights and Protection

Consumer Rights: The home maker as a wise consumer, consumer education–consumer aids–advertisement–standards-labels–pricetag.Consumerprotection–need measures adopted to provide consumer protection–consumer laws–consumer courts–consumer movement. Residence course –need, objectives planning, organization and evaluation of the course–role of a supervisor and staff adviser. **(7L+7T)**

References:

1. Deshpande,R.S.ModernIdealHomesforIndia–UnitedBookcorporations,Pune,1971.
2. PaulenaNickell,JeanMuirDorsey–ManagementinFamilyLiving,WileyEasternPrivateLtd.,1976.
3. VanDommolen,D.B.DesigningandDecoratingBook, JohnWiley&Sons.1991.
4. Mann,M.HomeManagementforIndianfamilies,NewDelhiKalyanPublishers.1980.
5. StellaSoundararaj. ATextbookofHouseholdArts,OrientLongmans,Bombay,1968.
6. MargaretKaye.A.AStudentshandbookofHousewifery,J.M.DentSonsLtd.,London.1986.

Course Outcomes

On completion of the course, the students will be able to

CO. No	Course Outcomes	Cognitive level
CO-1	Prioritize the importance of home management	**K2 - Understanding**
CO-2	Formulate the resources to improve the standard of living	**K3 - Applying**
CO-3	Understand the method of time and energy management	**K4 - Analyzing**
CO-4	Interpret the use of money management	**K5 - Evaluating**

CO-5	Discover the consumer rights and protection	**K6 - Creating**

Mapping

FAMILY RESOURCE MANAGEMENT–II											
CO	**PO**					**PSO**					
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**
1	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**
2	**3**	**3**	**2**	**3**	**2**	**3**	**3**	**2**	**3**	**2**	**2**
3	**3**	**3**	**2**	**3**	**1**	**3**	**3**	**2**	**3**	**2**	**2**
4	**3**	**1**	**1**	**1**	**2**	**1**	**2**	**1**	**2**	**1**	**1**
5	**3**	**1**	**2**	**2**	**1**	**1**	**2**	**1**	**1**	**2**	**2**

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/2020- 21/UG colleges/Part III (B.Sc. Food Science & Nutrition) Semester - IV / Allied

Practical – IV FAMILYRESOURCEMANAGEMENT–II

1.Study of expenditure pattern of your family and preparation of a model family budget/budget suitable for various categories.

2. Study of waste management practices in your house/locality

3. Development of an art object from house hold waste materials.

4. Development and evaluation of labels and advertisements for consumer products.

Preparation of a consumer complaint for any consumer product.

5. Residence stay for a week incorporating principles of management. (A record of the entire practical should be maintained with preliminary preparation report and evaluation report).

References:

1. Deshpande, R.S.Modern Ideal Homes forIndia– United Book corporations,Pune.1971.

2. PaulenaNickell,JeanMuirDorsey–ManagementinFamilyLiving,WileyEasternPrivateLtd.,1976.
3. VanDommolen,D.B.DesigningandDecoratingBook–John Wiley&Sons.1991
4. Mann,M.HomeManagementforIndianfamilies,NewDelhiKalyanPublishers.1980.
5. Stella Soundararaj.A Textbook of HouseholdArts,OrientLongmans,Bombay,1968.

Course Outcomes

On completion of the course, the students will be able to

CO. No	Course Outcomes	Cognitive level
CO-1	Understand and Identify human and non-human resources for efficient management of the family	K2 - Understanding
CO-2	Identify human and non-human resources for efficient management of the family	K3 - Applying
CO-3	Face challenges put forth by recent trends in availability of resources	K4 - Analyzing
CO-4	Apply waste management practices	K5 - Evaluating
CO-5	Create labels and advertisements for consumer products	K6 - Creating

Mapping

Practical – IV FAMILYRESOURCEMANAGEMENT–II											
CO	**PO**					**PSO**					
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**
1	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**
2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**1**	**2**
3	**3**	**3**	**3**	**3**	**1**	**3**	**3**	**2**	**3**	**1**	**2**
4	**3**	**3**	**3**	**3**	**1**	**2**	**2**	**1**	**2**	**2**	**1**
5	**2**	**2**	**2**	**2**	**1**	**2**	**2**	**2**	**2**	**2**	**2**

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU2021-2022/UG colleges/Part III(B.Sc. Food Science& Nutrition) Semester IV/ Skill based–II

Core

NUTRITION AND HEALTH COMMUNICATION

Objectives **LTPC40**

1. Understand thought diffusion processes of the individual and the Community
2. To know effective communication techniques and methods
3. To plan and develop health and nutrition education communication messages strategies

UnitI: Concept of Nutrition and Health Education

Principles and scope of nutrition and health education and promotion

UnitII: Development in India- rural and urban

Philosophy, Strategies, achievements and problems with reference to 5year plans and various Governmental and Non-Governmental Schemes. Communication in Urban areas, Diversity in India's Population.

Unit III: Communication and Social Development

Health Education and Nutrition Education, Environmental and family hygiene,

Unit IV: Teaching Methods

Formal and Non Formal Methods. Individual, Group and mass approach. Expository, Discovery, Participatory, evaluative Simulation Games, Brain Storming.

Unit V: Concept of Poverty

Conceptualizing poverty, Difference between Absolute and Relative poverty, Concepts of poverty line - below poverty and poverty trap.- types of loan , repayment , interest date , Poverty alleviation programmes and projects

References

1. RNSharma, 1979,IndianRuralSociology,NewDelhi:MunshiramManoharlal
2. RKSharma, 1997,RuralSociology,NewDelhi:Atlantic
3. JBChitambar,3rdEd2018,IntroductoryRuralSociology,NewDelhi:NewAgePublishers4.AhujaH.L.,2010, ModernMicroEconomics.SultanChand&sons
5. DhingraICandGargVK,2010,IntroductoryEconomicTheory.SultanChand&Sons
6. Mishra&Puri,Recentedition2014,IndianEconomy,HimalayaPublishingHouse

7. Hinton, S and Larissa, H. (2013) Understanding Social Media, Sage Publications India

Course Outcomes

On completion of the course, the students will be able to

CO. No	Course Outcomes	Cognitive level
CO-1	Appropriate skills for developing nutrition education materials	K2 - Understanding
CO-2	Gain knowledge on mass communication, media and aid tools for nutrition education	K3 - Applying
CO-3	Utilize different communication tools for nutrition education	K4 - Analyzing
CO-4	Educate people on approaches, strategies and to organize nutrition education programmes	K5 - Evaluating
CO-5	Discuss on Various Research and Educational Institution in Community Nutrition	K6 - Creating

Mapping

NUTRITION AND HEALTH COMMUNICATION											
CO	**PO**					**PSO**					
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**
1	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**
2	**3**	**3**	**3**	**2**	**2**	**3**	**3**	**2**	**3**	**3**	**2**
3	**3**	**2**	**2**	**2**	**1**	**3**	**3**	**2**	**2**	**2**	**2**
4	**3**	**3**	**2**	**2**	**2**	**1**	**1**	**1**	**2**	**2**	**1**
5	**3**	**2**	**2**	**2**	**1**	**1**	**1**	**2**	**2**	**2**	**2**

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/2021-2022/UG colleges/Part IV(B.Sc. Food Science &Nutrition)
Semester IV/Non-Major Elective II
BAKERY

Objectives: **LTPC**

1. Discuss the basic principles and importance of leavening agents in baking

2. Illustrate the role of various major and minor ingredients used in bakery products.

3. Categorize the role of enzymes and additives in baking process

4. Experimenting the baking process and familiarize with operations.

5. Design the quality parameters of bakery products

Unit I Introduction(6L)

Introduction to baking, Principles of baking, Equipment needed–ovens, dough mixer and eggbeater.

Unit II Role of ingredients in baking– I(7L)

Wheat, Fats and oils, Egg

Unit III Role of ingredients in baking– II(7L)

Milk, Sugar, Salt and Water, Flavoring agents, Leavening agents–physical, biological

Unit IV(5L)

Preparation of cakes– rich cakes, plum cakes, pineapple upside cake.

Unit V

Cookies–ingredients and mixing methods, types of process**,** Bread rolls.

References

1. Kent.N.L.: Technologyofcereals–Press, NewYork, USA.1975.

2.France.W.J:ThestudentTechnologyofBreadmakingandflourconfectionery,RoutledgeandKeganPaulLtd., London,UK.1974.

3.Sultan.W: Practicalbakingmanual–for students and instructors,AVIPublishingCo.INC,WestPort,Connecticut.1976.

4.MatzS.A.:BakeryTechnology,packaging,nutrition,productdevelopmentandqualityassurance,ElsevierSci encePublisherLtd.,New York, USA.1989.

5.Malik.R.K.andDhingra.K.C.:TechnologyofBakeryIndustries.Small IndustryResearchInstitute,NewDelhi,India.1981.

6.Pomeraz,Y.:WheatChemistryandTechnology,Vol.1andIIAmericanAssn.ofCerealChemists,3rdEd. St. PaulMinnesota,USA.1988.

7.Matz. S.A. Technologyfor theMaterialsof Baking, ElsevierSciencePublishers.Baking,England.1989.

8.Yogambal andAshokkumar, Theory ofBakeryandConfectionary,PHTlearningPrivate Limited, NewDelhi.2009.

Course Outcomes

On completion of the course, the students will be able to

CO. No	Course Outcomes	Cognitive level
CO-1	Understand the role of various major and minor equipment's used in bakery products.	**K2 - Understanding**
CO-2	Describe the principles and importance of major ingredients in baking	**K3 - Applying**
CO-3	Sketch the role of basic ingredients like flour, fat, egg, milk, water, salt and sugars in baking.	**K4 - Analyzing**
CO-4	Experimenting with different types of cakes and icings.	**K5 - Evaluating**
CO-5	Formulate different types of cookies and bread rolls.	**K6 - Creating**

Mapping

BAKERY											
CO	**PO**					**PSO**					
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**
1	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**
2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**2**
3	**3**	**3**	**3**	**3**	**1**	**3**	**3**	**2**	**2**	**2**	**2**
4	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**1**	**3**	**3**	**1**
5	**2**	**3**	**2**	**3**	**1**	**3**	**2**	**2**	**3**	**2**	**2**

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

MSU/2021-2022/UG colleges/Part IV (B.Sc. Food Science Nutrition)

Semester IV/Non-Major Elective II

DIETTHERAPY-II

Objectives

1. To gain insight into the national nutritional problems and their implications
2. To obtain knowledge about the methods of assessment of nutritional status
3. Develop skills in organizing and evaluating nutrition projects in the community

Unit I

Obesity - Causes , Assessment, types, treatment, dietary guidelines , underweight- Causes ,Nutritional requirements and dietary guidelines , Diabetes Mellitus- Types, Aetiology , symptoms, complications and dietary guidelines

Unit II

Peptic ulcer - Aetiology , symptoms, Nutritional requirements and dietary guidelines, Cirrhosis and Hepatitis - Aetiology , symptoms ,Nutritional requirements and dietary guidelines

Unit III

Atherosclerosis- Risk factors , Role of fat, Nutritional requirements and dietary Management, Hypertension - Types, Symptoms , Nutritional requirements and dietary Management

Unit IV

Febrile condition- Types, Symptoms ,General dietary guidelines , for Typhoid, Tuberculosis and Malaria.

Unit V

Renal failure, - Causes , Symptoms , Nutritional requirements and dietary guidelines, Cancer- Types, Symptoms, Nutritional requirements and dietary Management, Burns - Types, Symptoms, Nutritional requirements and dietary Management

Reference:

1.SriLakshmi, B. Dietetics,WileyEasternpublishers.2004.

2.CorrineRobinsonand Lawler. Normal andTherapeuticNutrition, Oxford andIBHpublishers.1990.

3.Swaminathan.M.Principles ofNutritionandDietetics, BAPPCOpublishers,Bangalore.2003.

4.Gopalan,Balasubramaniam&RamasastriNutritiveValueofIndianfoods,
NIN publication,Hyderabad.1996.

5.Bhavana Sabarwal. Principles andpracticesofDietetics,AjayVermacommonwealthpublishers,NewDelhi.

6.DavidsonPassmore.HumanNutritionandDietetics,LondonChurchilland Livingston publishers 1989.

Course Outcomes

On completion of the course, the students will be able to

CO. No	Course Outcomes	Cognitive level
CO-1	Explain the dietary modification for obesity and underweight.	K2 - Understanding
CO-2	Identify the nutritional requirements for GI tract and liver diseases.	K3 - Applying
CO-3	Analyze the dietary modification for CVD	K4 - Analyzing
CO-4	Determine the nutritional and food requirements for fever and infections.	K5 - Evaluating
CO-5	Discuss the lifestyle modifications for kidney diseases.	K6 - Creating

Mapping

DIET THERAPY-II											
CO	**PO**					**PSO**					
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**6**
1	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**
2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**2**
3	**3**	**2**	**2**	**2**	**1**	**3**	**2**	**2**	**2**	**2**	**2**
4	**3**	**2**	**2**	**2**	**2**	**2**	**1**	**1**	**2**	**2**	**1**
5	**3**	**2**	**2**	**1**	**1**	**1**	**2**	**2**	**1**	**1**	**2**

Strongly Correlated (3); Moderately Correlated (2); Weakly Correlated (1); No Correlation (0)

Non Major Diet Therapy II Course Outcome:

CO1: Understand the basics concepts of Dietary management.

CO 2: Acquire knowledge on the roles and responsibilities, skills, ethics and opportunities for a dietician

CO 3: Apply principles of diet therapy, modification