



THIRUVALLUVAR UNIVERSITY

SERKKADU, VELLORE-632115

**B.Sc. NUTRITION FOOD SERVICE
MANAGEMENT AND DIETETICS**

SYLLABUS

FROM THE ACADEMIC YEAR

2023 - 2024

Undergraduate Programme in Home Science - Nutrition, Food Service Management and Dietetics

Model Curriculum and Syllabus

JUNE 2023

Model Curriculum and Syllabus for B.Sc Home Science - Nutrition, Food Service Management and Dietetics

(With effect from the Academic Year 2023-24)

I. Preamble

Home Science is a broad area with a focus on inter-disciplinary perspectives. Subjects which fall under the umbrella of Home Science include Foods and Nutrition, Textiles and Clothing, Community Nutrition, Food Service Management and Dietetics, Interior Decoration and Human Development. The branch of ***Nutrition, Food Service Management and Dietetics*** offers a wide array of courses which can equip graduates to be engaged as dietitian or nutritionists in healthcare industry or fitness centres, as entrepreneurs in food and hospitality sectors or serve as interior decorators. Thus, this programme offers courses which can synergistically promote the quality of lives of the community as a whole. Nutrition professionals are in high demand due to the fast-paced lifestyle, and an increasing incidence of lifestyle related diseases affecting all segments of the population. With an increasing focus on healthier lifestyles, a well-trained nutritional professional can contribute significantly in designing community-based intervention programs for the betterment of the society. For a Home maker, this programme will give an insight into effective management of different resources in daily life. Globalization has created a market for jobs with different skills in the areas of food industries which has been duly considered in this course curriculum. This programme can also lay foundation to evidence based research and qualify the student to pursue higher education in any field of specialization arising from the branch of Home Science.

Nature and Extent of the Programme

Home Science has adopted an ecological approach in its curriculum that engages the student through teaching, research and extension. Nutrition, Food service Management and Dietetics is a programme that enhances the quality of life in a holistic manner. Students develop professional skills in areas relating to food, nutrition, product making, communication technologies and human development. The programme offers courses

such as Physiology, Biochemistry, Nutrition which will help students understand the human system in an effective manner to plan diets for various clinical conditions, and thus provide opportunities for serving in hospitals as dietitian. Courses related to Food service management offers an insight into different food outlets, their organization, and management of human and financial resources. Courses such as Interior decoration, Human development and resource management opens up avenues for entrepreneurial ventures.

The new structure of the curriculum includes 15 Core papers that gives solid foundation in the specialization of Nutrition, Food Service Management and Dietetics, which are ably supported by 8 Elective papers that give insight into related subjects of study under the branch Home Science which include Food Preservation, Sports Nutrition, Basics in Research, Human Development, Interior Decoration and resource management, Special focus on enhancing the skills is provided through 8 Skill enhancement courses that ensure acquisition of transferrable skills that increase the employability readiness of the student in multiple avenues that are either closely or distantly related to the centric subject of Home Science. Emphasis on professional competency is offered through course papers in soft skill, ability enhancement and competitive exams preparedness is an additional highlight of the newly framed curriculum. Thus, the programme offers a wide scope for various career options, and also paves the way for specialization in a wide variety of post graduate programmes under the umbrella of Home Science.

Aim of the Programme

The aim of the programme is to provide students in-depth knowledge and skill that can find them suitable placement in a wide variety of fields under the domain of Home Science. It also encourages students to venture into entrepreneurship in areas related to food, nutrition counselling, interior decoration, human development and resource management. Training in professional competency is an added feature that prepares students to face competitive examinations quite comfortably.

PROGRAMME OBJECTIVES

Programme	B.Sc Home Science-Nutrition Food Service Management and Dietetics
Code	U27
Duration	3 years [UG]
Programme Outcomes	<p>PO1: Disciplinary Knowledge and Skills Demonstrates theoretical and practical knowledge and understanding of Subjects related to Food Science, Nutrition and Food Service Management/ Interior Design and Decoration</p> <p>PO2: Effective Communicator Capable of effective communication of subjects specific scientific information Through oral and written formats using ICT wherever necessary. Explores communication skill set to engage key stakeholders such as the family, food service institutions and community.</p> <p>PO3: Critical thinking, Analytical reasoning and problem solving Applies disciplinary knowledge, understanding and transferable skills to the given context. Capable of identifying and analysing problems and issues and seeks solutions to real-life problems;</p> <p>PO4: Research and Scientific Reasoning Demonstrates skills in research through collection of relevant qualitative and quantitative data, analysis and interpretation of data using appropriate methodologies for formulating evidence based solutions and arguments</p> <p>PO5: Co-operation/Team Work Capable of contributing significantly and working enthusiastically both independently and in a group</p> <p>PO6: Digital Literacy Demonstrates competency in accessing relevant and authentic information And data from electronic media with a motive to learn and synthesize Information for academic and extension work presentation; prepare Computer aided designs and uses specific software to plan and calculate Nutrient content of diets; for academic presentations;</p> <p>PO7: Multicultural competence Recognizes and assesses societal, environmental and cultural issues related to area of study within the local and global context</p> <p>PO8: Moral and Ethical awareness/reasoning: Displays moral responsibility and values; Has a professional approach, is objective, unbiased and truthful in all aspects of work and refrains from unethical practices such as plagiarism, fabrication, falsification, misinterpretation of the data and breaching intellectual property rights</p>

	<p>PO9:Leadershipreadiness/qualities Develops leadership skills, takes initiative, mobilizes resources and has the capacity to lead community based projects and initiatives successfully</p>
	<p>PO10:Lifelong learning Capable of staying motivated to be updated consistently with content, concepts, theories, specializations, fields, technologies, books and avenues to meet professional and personal needs at any given instant.</p>
	<p>Programme Specific Outcomes: On successful completion of the program the student;</p>
PSO1	<p>Acquires knowledge and understanding of concepts in core areas such as Foods, Nutrition, Dietetics and Food Service Management and in supporting courses such as Physiology, Microbiology, Biochemistry and Community Nutrition as well as related disciplines such as Interior Decoration, Resource Management and Human Development.</p>
PSO2	<p>Develops ability to articulate subject knowledge effectively both orally or written, to all categories of stakeholders/beneficiaries such as patients, clients, Professionals and lay person.</p>
PSO3	<p>Is competent in the use of ICT for collecting and disseminating scientific Information</p>
PSO4	<p>Acquires skill to translate knowledge of food and nutrition to select foods, structure meal plan to meet the nutritional requirements of an individual under conditions of normal health and disease</p>
PSO5	<p>Is capable of pursuing higher education, research or engaging in teaching, Entrepreneurship or rendering service in Government, public or corporate sector.</p>

CREDIT DISTRIBUTION FOR UG PROGRAMME

Sem I	Credit	Sem II	Credit	Sem III	Credit	Sem IV	Credit	Sem V	Credit	Sem VI	Credit
1.1.Language	3	2.1.Language	3	3.1.Language	3	4.1.Language	3	5.1 Core Course– CC IX Dietetics	3	6.1 Core Course– CCXIII Quantity Food Production (Theory& Practical)	4(2+2)
1.2 English	3	2.2English	3	3.2 English	3	4.2English	3	5.2 Core Course– CCX Food Service Management	3	6.2 Core Course– CCXIV Dietetics practical	5
1.3 Core Course – CC I Human Physiology	5	2.3 Core Course –CC III Food Science	5	3.3 Core Course –CC V Human Nutrition	5	4.3 Core Course –CC VII Nutrition through the life cycle	4	5. 3.Core Course CC –XI Public Health Nutrition	4	6.3 Core Course –CCXV Clinical Nutrition	3
1.4 Core Course –CC II Basics of Food Microbiology	5	2.4 Core Course –CC IV Basic Cookery Practical	5	3.4 Core Course –CC VI Nutritional Biochemistry	5	4.4 Core Course –CC VIII Nutrition Practical	5	5. 4.CoreCourse – /Project with viva- voce CC - XII	4	6.4Elective -VII Generic/ Discipline Specific Functional Foods and chronic diseases	3
1.5 Elective I Generic/ Discipline Specific Allied Chemistry	3	2.5 Elective II Generic/ Discipline Specific Allied Chemistry (T+P)	3 (1+2)	3.5 Elective III Generic / Discipline Specific Human Development	3	4.5 Elective IV Generic/ Discipline Specific Foundations of Baking and Confectionery (T+P)	4 (2+2)	5.5Elective V Generic/ Discipline Specific Food Preservation and Processing	3	6.5 Elective VIII Generic/ Discipline Specific Foundations of Entrepreneurship	3
1.6 Skill Enhancement Course SEC-1 Women, Health and Wellness	2	2.6 Skill Enhancement Course SEC-2 Life Skills, Strategies and Techniques	2	3.6 Skill Enhancement Course SEC-4, (Entrepreneurial Skill) Consumer Education	1	4.6. Skill Enhancement Course SEC-6 Preschool and Creche Management	2	5.6 VI Generic/ Discipline Specific Elective – VI Interior Decoration	3	6.6 Extension Activity	1
1.7. Skill Enhancement- (Foundation Course) home science- nutrition food service management and dietetics	2	2.7 Skill Enhancement Course–SEC-3 Basics in Food Product Development	2	3.7 SkillEnhancement CourseSEC-5 Fundamentals of Research in Nutritional Sciences	2	4.7 Skill Enhancement Course SEC-7 Computer Application in Home Science	2	5.7 Value Education	2	6.7 Professional Competency Skill (Aptitude and Reasoning Skill for Competitive Examinations)	2
-	-	-	-	3.8. E.V.S	2			5.8 Summer Internship /Industrial Training	2	-	-
	23		23		24		23		26		21
Total Credit Points											140

THIRUVALLUVARUNIVERSITY
B.SC.DEGREECOURSEINHOMESCIENCE–NUTRITION,FOOD SERVICE
MANAGEMENT AND DIETETICS

W.E.F.2023-2024andthereafter

CURRICULUMDESIGN FORUGDEGREEPROGRAMME

CreditDistributionforUGDegreeProgramme

B.Sc. Nutrition, Food Service Management and Dietetics

Second Year
Semester-III

Part	List of Courses	Credit	Hours per Week (L/T/P)
Part-I	Language	3	6
Part-II	English	3	6
Part-III	Core Course-CC V-Human Nutrition	5	5
	Core Course-CC VI-Nutritional Biochemistry	5	5
	Elective Course (Generic/ Discipline Specific) EC3- Human Development	3	5
Part-IV	Skill Enhancement Course-SEC-4-Consumer Education	1	1
	Skill Enhancement Course-SEC-5-Fundamentals of Research in Nutritional Sciences	2	2
	Environmental studies	2	2
		24	32

Semester-IV

Part	List of Courses	Credit	Hours per week (L/T/P)
Part-I	Language	3	6
Part-II	English	3	6
Part-III	Core Course- CC VII-Nutrition through the life cycle	4	5
	Core Course- CC VIII-Nutrition Practical	5	5
	Elective Course (Generic/ Discipline Specific) EC4 Foundations of Baking and Confectionery	2	4
	Elective Course (Generic/ Discipline Specific) EC4 Foundations of Baking and Confectionery Practical	2	2
Part-IV	Skill Enhancement Course–SEC6- Preschool and Creche Management	2	2
	Skill Enhancement Course-SEC-7 Computer Application in Home Science	2	2
		23	32

**Third Year
Semester-V**

Part	List of Courses	Credit	Hours per Week (L/T/P)
Part-III	Core Course- CC IX- Dietetics	5	5
	Core Course- CC X- Food Service Management	4	5
	Core Course- CC XI- Public Health Nutrition	3	4
	Elective Course (Generic/ Discipline Specific)-EC 5- Food Preservation and Processing	3	4
	Elective Course (Generic/ Discipline Specific)-EC 6-Interior Decoration	3	4
	Core/Project with Viva voce CC12	4	4
Part-IV	Value Education	2	2
	Internship/Industrial Training (30 hours)	2	2
		26	30

Semester-VI

Part	List of Courses	Credit	Hours per week(L/T/P)
Part-III	Core Course- CC XII- Quantity Food Production	2	3
	Core Course- CC XII- Quantity Food Production Practical	2	3
	Core Course- CC XIII- Dietetics Practical	5	6
	Core Course- CC XIV- Clinical Nutrition	3	6
	Elective Course (Generic/ Discipline Specific)- EC 7-Functional Foods and chronic diseases	3	5
	Elective Course (Generic/ Discipline Specific)- EC 8-Foundations of Entrepreneurship	3	5
Part IV	Extension Activity(Outside college hours)	1	-
Part-V	Professional Competency Skill (Aptitude and reasoning skill for competitive examinations)	2	2
		21	30

Total Credits: 140

CONSOLIDATED SEMESTER WISE AND COMPONENT WISE CREDIT DISTRIBUTION

Parts	Sem I	Sem II	Sem III	Sem IV	Sem V	Sem VI	Total Credits
Part I	3	3	3	3	-	-	12
Part II	3	3	3	3	-	-	12
Part III	13	13	13	13	22	18	92
Part IV	4	4	3	6	4	1	22
Part V	-	-	-	-	-	2	2
Total	23	23	22	25	26	21	140

***Part I, II and Part III components will be separately taken into account for CGPA calculation and classification for the undergraduate programme and the other components. IV, V have to be completed during the duration of the programme as per the norms, to be eligible to obtain the UG degree.**

Methods of Evaluation Theory and Practical		
Internal Evaluation	Continuous Internal Assessment Test	25 Marks
	Assignments	
	Seminars	
	Model examination	
	Attendance and Class Participation	
External Evaluation	End Semester Examination	75 Marks
	Total	100 Marks

**SECOND YEAR
SEMESTER –III**

Title of the Course		HUMAN NUTRITION								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Core Course CC V	III	Y		Y		5	5	25	75	100

Learning Objectives
To enable the students to:
Understand the importance of various macronutrients in relation to health.
Highlight dietary guidelines for various nutrients and contribute towards a better lifestyle for prevention of non-communicable diseases.

UNIT	CONTENT	HOURS
UNIT I	Introduction to nutrition History of Nutrition – Development of Nutrition as a Science Food as a source of nutrients, definition of nutrients, Balanced diets and dietary guidelines-current concepts Signs and symptoms of adequate, optimum and good nutrition, malnutrition (Under nutrition, and over nutrition), Assessment of Nutritional status- Anthropometric, Biochemical, Clinical and Dietary aspects.	7
	Activity - Plan meals based on My-Plate concepts, Record Height, Body weight, and calculate Body Mass Index (BMI) in a small sample, and categorize according to BMI.	3

<p>UNITII</p>	<p>Carbohydrates Classification, Food Sources, Requirements and Functions of carbohydrates in the body. Review of digestion, absorption and metabolism. Physiological significance of Monosaccharide, Disaccharides and Polysaccharides Glycemic Index, Glycemic load of Foods, and factors affecting it, Hormonal control of Blood sugar. Role of fiber in prevention of non-communicable diseases.</p> <p>Proteins Amino acids- Indispensable and dispensable amino acids. Classification, Sources, Requirements and functions of protein. Mutual supplementation of proteins. Protein deficiency-Protein Energy Malnutrition- Kwashiorkor and Marasmus- etiology, clinical features, treatment and prevention Evaluation of protein quality- PER, BV, NPU and NPR, chemical score. Protein Supplements and Novel Protein sources- Benefits and Health Concerns</p>	<p>17</p>
	<p>Activity-List foods based on their GI, and Protein supplements available in the market.</p>	<p>3</p>
<p>UNITIII</p>	<p>Lipids Classification, Sources, Requirements and functions, Essential fatty acids- deficiency, food sources and functions, Healthy and Unhealthy Fats in the diets, Dietary lipids and its relation to cardiovascular diseases.</p> <p>Energy Determination of energy value of foods using Bomb calorimeter, Physiological value of foods, relation between oxygen used and calorific value. Direct and Indirect calorimetry, Respiratory quotient Components of Energy expenditure- Basal metabolism, factors affecting BMR, Food related thermogenesis, Physical activity Energy requirements for different age groups, and for various types of activities.</p>	<p>17</p>
	<p>Activity-List the healthy and unhealthy sources of fats in one's diet. Learn to estimate BMR.</p>	<p>3</p>
<p>UNITIV</p>	<p>Fat Soluble Vitamins Food sources, Requirements, Functions, Effects of deficiency or Toxicity (wherever applicable).</p> <p>Water Soluble Vitamins Food sources, Requirements, Functions, Effects of deficiency. Antioxidant role of certain Vitamins in Health promotion</p>	<p>10</p>

UNIT V	<p>Macrominerals Calcium, Phosphorous, Magnesium, Potassium, Sodium and Chloride- Distribution in the body, functions, food sources, requirements, effects of deficiency and toxicity.</p> <p>Micro/Trace minerals Iron, Zinc, Iodine, Selenium, Manganese, Chromium, Fluoride and Copper Distribution in the body; functions, effects of deficiency, food sources and requirements, Role of Antioxidant minerals</p> <p>Water As a nutrient, functions, sources, requirements. Distribution of water in the body, exchange of water in the body, composition of body fluids. Water balance, factors regulating it, dehydration, water intoxication.</p>	15
	TOTAL	75

COURSE OUTCOMES

After successful completion of the course, the student will be able to:

- CO1.** Define nutrients and terms related to nutrition.
- CO2.** Describe the sources, recommended allowances of macronutrients, micronutrients, and water.
- CO3.** Interpret the significance of macro and micronutrients, and water for maintenance of optimum health.
- CO4.** Explain the functions, deficiency or toxicity of macro and micronutrients, and water.
- CO5.** Evaluate the role of macronutrients, micronutrients, and water in health and disease.

REFERENCE:

1. Anderson J. J. B., Root M. M., Garner S. C. (2015) Human Nutrition: Healthy Options for Life. Jones & Bartlett Learning, Massachusetts, USA.
2. Guthrie, H. A. (1989) Introductory Nutrition. 7th ed. Times Mirror/Mosby College Publishing, St. Louis
3. Insel P., Ross D., McMahon K., Bernstein M. (2016) Discovering Nutrition. 5th Ed., Jones & Bartlett Learning, Massachusetts, USA.
4. Mahan K. and Sylvia E. Stump (2000) Krause's Food Nutrition and Diet Therapy, Saunders, USA
5. Medeiros D. M., and Wildman R. E. C. (2019) Advanced Human Nutrition. 4th Ed., Jones & Bartlett Learning, Massachusetts, USA.
6. Ross A. C., Caballero B., Cousins R. J., Tucker K. L., Ziegler T. R. (2014) Modern Nutrition in Health and Disease. 11th Ed., Wolters Kluwer | Lippincott Williams & Wilkins, Philadelphia, USA.
- 7.Sizer F. S. and Whitney E. (2014) Nutrition: Concepts & Controversies. 13th Ed., Wadsworth, Cengage Learning, USA.

8. Whitney, E.R.andRolfes S.R. (1996)Understanding nutrition. 7th Ed., West PublishingCompany,USA

E-LEARNINGRESOURCES:

- <http://www.merck.com/mmhe/seciz/ch155/ch155a.html>
- <http://www.whereincity/medical/vitamins>

MappingwithProgrammeOutcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	M	M	L	L	M	S
CO2	S	S	S	M	M	M	L	L	M	S
CO3	S	S	S	S	M	M	S	M	M	S
CO4	S	S	S	M	M	M	L	M	M	S
CO5	S	S	S	S	M	M	L	M	M	S

MappingwithProgrammeSpecificOutcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weightedpercentage(roundedof)of CourseContributionto Pos	3	3	3	3	3

Title of the Course		NUTRITIONAL BIOCHEMISTRY								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Core Course CC VI	III	Y				5	5	25	75	100

Learning Objectives

To enable the students to:

Study the basic concepts of metabolism of proximate principles and others.

To learn the metabolic pathways of nutritional significance.

UNIT	CONTENT	HOURS
UNIT I	<p>Biological oxidation and Enzymes</p> <p>Biological oxidation, Electron transport chain and Oxidative Phosphorylation. Enzymes – Definition, Types, Mechanism of action, Factors affecting enzyme activity, Coenzyme, Role of vitamins as coenzyme. Free radicals – Definition, Formation in biological systems. Antioxidants – definition, Role of antioxidants in prevention of degenerative disorders</p>	15
UNIT II	<p>Metabolism of Carbohydrates</p> <p>Classification, Glycolysis, The Citric Acid Cycle, Glycogenesis, Glycogenolysis, Gluconeogenesis, The Hexose Monophosphate Shunt and bioenergetics.</p>	15
UNIT III	<p>Metabolism of Protein</p> <p>Classification of amino acids, Oxidative Deamination, decarboxylation, transamination and transmethylation of amino acids, urea cycle, biosynthesis of non-essential amino acids, catabolism of essential amino acids. Protein biosynthesis.</p>	15
UNIT IV	<p>Metabolism of Lipids</p> <p>Classification of fatty acid, Biosynthesis of fatty acids, beta oxidation of saturated fatty acids, ketone bodies. Essential fatty acids – types and functions. Lipoproteins – classification and function. Biosynthesis of cholesterol.</p>	15
UNIT V	<p>Intermediary Metabolism, Nucleic acid & Recent concepts</p> <p>Overview of intermediary metabolism of carbohydrates, protein and lipid. Hormonal regulation of carbohydrate, protein and fat metabolism. Structural components and functions of nucleic acid, Structure of DNA, RNA types and functions. Recombinant DNA technology, Metabolism of Xenobiotics, Nutrigenomics</p>	15
	TOTAL	75

COURSE OUTCOME

After successful completion of the course the students will be able to

- CO1.** Describe the role of enzymes and co enzymes in biological oxidation.**CO2.** Explain metabolism and regulation of carbohydrate, lipids and proteins**CO3.** Analyze the integration of carbohydrate, lipid and protein metabolism
CO4. Comprehend the significance of recent biochemical concepts namely xenobiotics, recombinant DNA technology and Nutrigenomics.
CO5. Discuss the structure and functions of nucleic acids.

REFERENCES

1. Albanese, A. (Ed.). (2012). Newer methods of nutritional biochemistry V3: With applications and interpretations. Elsevier.
2. Bettelheim, F. A., Brown, W. H., Campbell, M. K., & Farrell, S. O. (2009). General, Organic & Biochemistry. Brooks/Cole Cengage Learning.
3. Champe, P. C., Harvey, R. A., & Ferrier, D. R. (2005). Biochemistry. Lippincott Williams & Wilkins, 6th Edition, Wolters Kluwer, London.
4. Harvey, R. and Ferrier, D., Lippincott's Illustrated Reviews: Biochemistry, 6th edition, Lippincott Williams and Wilkins, Philadelphia.
5. Lehninger, A. L. (1993) Biochemistry. 3rd ed. CBS Publishers, New Delhi.
6. Lieberman, M., & Ricer, R. E. (2009). Lippincott's Illustrated Q&A Review of Biochemistry. Lippincott Williams & Wilkins.
7. Murray, R. K., Granner, D. K., Mayes, P. A. and Rodwell, V. W. (2000): 25th Ed. Harpers Biochemistry. Macmillan worth publishers.
8. Shanmugham Ambika (1985) Fundamentals of biochemistry for medical students. NVA Bharat Printers and traders 56, Peters Road, Madras-86.

e- LEARNING RESOURCES:

- <https://www.udemy.com/share/1027yA/>
- <https://www.classcentral.com/course/swayam-biochemistry-5229>
- <https://www.classcentral.com/course/edx-biochemistry-biomolecules-methods-and-mechanisms-12585>
- <https://www.classcentral.com/course/swayam-experimental-biochemistry-12909>
- <https://youtu.be/y6YGZfcAegw>

MappingwithProgrammeOutcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	M	M	L	L	M	S
CO2	S	S	S	M	M	M	L	L	M	S
CO3	S	S	S	S	M	M	S	M	M	S
CO4	S	S	S	S	M	M	L	M	M	S
CO5	S	S	S	S	M	M	L	M	M	S

MappingwithProgrammeSpecificOutcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weightedpercentage(roundedof)of CourseContributionto Pos	3	3	3	3	3

Title of the Course		HUMAN DEVELOPMENT								
Category	Year	L	T	P	O	Credits	Inst. Hrs	Marks		
	Sem							CIA	External	Total
Elective Course – EC 3	III	Y		Y		3	4	25	75	100

Learning Objectives
To enable the student to:
Familiarize with the growth process from conception to confinement.
Know the development of an individual from infancy to old age.
Understand the physical, psychological, and social development of the individual from infancy to old age.
Develop an awareness of the problems of children, adolescent, and exceptional children.

UNIT	CONTENT	HOURS
UNIT I	Growth and development Meaning-growth and development, principles of governing growth and development, developmental task of different stages. Methods of study of human development.	10
	Practical - preparation of case study - observing various development-physical, motor, cognitive, creative, social, emotional, and intellectual of a particular child.	10
UNIT II	Infancy and Childhood Characteristics, physical, social, and emotional development, cognitive and language development during infancy, early childhood, and late childhood. Children's play – meaning, types, importance stages. Parental disciplinary Techniques – merits and demerits	16
	Practical - Socio-metric study of early adolescents. Analysis of various play techniques.	4
UNIT III	Adolescence Adolescence – physical and psychological changes, emotional, moral and social development, Problems of adolescence.	10

	Delinquency—causes, prevention, and rehabilitation. Educational and vocational guidance, role of family and schools and colleges in guiding adolescence	
	Practical - A survey on Juvenile Delinquency prevalence.	5
UNITIV	Adulthood and Old Age Adulthood- Characteristics and developmental tasks, all aspects of development and vocational adjustments. Old age- Characteristics of old age, physical changes, psychological changes. Place of the aged in Indian Society	7
	Practical - Survey on problems of old age.	3
UNITV	Exceptional Children Introduction to Children with Special Needs and identification & Educational Rehabilitation Gifted children Mentally retarded Visually handicapped Orthopedically challenged Hearing impaired Learning disability	7
	Practical - Visit to an institution for exceptional children.	3
	TOTAL	75

COURSE OUTCOME

After successful completion of the course the student will be able to

- CO1.** Describe the meaning and principles of Growth & Development
- CO2.** Explain developmental aspects during infancy, early and late childhood.
- CO3.** Evaluate developmental aspects during adolescence.
- CO4.** Identify the developmental tasks during adulthood and old age.
- CO5.** Introduction to Children with Special Needs and identification & Educational Rehabilitation

References

1. Hurlock E.B., (1972). Child Development, New York: McGraw Hill Book company.
2. Hurlock, E.B., (1995): Developmental Psychology- A Life Span Approach, 5th (Ed.) New York: McGraw Hill Book Co.
3. Nanda V.K., (1998): Principles of Child Development, New Delhi: Anmol Publications Pvt. Ltd.
4. Rajammal P. Devadas and Jaya N. Muthu (2002). A Textbook of Child Development, New Delhi: Macmillan Publishers.
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OrientBlack Swan.

6. SuriakanthiA.,(1997).ChildDevelopment–AnIntroduction,TamilNadu:KavithaPublishers
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8. Suriakanthi,A.,(2009). ChildDevelopment.Kavithapublications,Tamil

e- LearningResources

- i. http://www.wbnsou.ac.in/online_services/SLM/BED/SEM-01_A1.pdf
- ii. <https://ncert.nic.in/textbook/pdf/kepy104.pdf>
- iii. <https://egyankosh.ac.in/bitstream/123456789/17134/1/Unit-3.pdf>
- iv. https://www.cukashmir.ac.in/departmentsdocs_16/Growth%20&%20Development%20-%20Dr.%20Ismail%20Thamarasseri.pdf

MappingwithProgrammeOutcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	M	S	S	M	S
CO2	S	S	S	M	S	M	S	S	M	S
CO3	S	S	S	M	S	M	S	S	M	S
CO4	S	S	S	M	S	M	S	S	S	S
CO5	S	S	S	M	S	M	S	S	S	S

MappingwithProgrammeSpecificOutcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weightedpercentage(roundedof)of CourseContributionto Pos	3	3	3	3	3

Title of the Course		CONSUMER EDUCATION								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Skill Enhancement Course SEC- 4	III	Y		Y		1	1	25	75	100

Learning Objectives
To enable the student to:
Become familiar with the problems in buying and consumer legislations.
Become aware of marketing conditions and the means for problem redressal.
Create awareness on various consumer buying problems.

UNIT	CONTENT	HOURS
UNIT I	Consumerism and consumer buying problem - Definition and the concept of consumerism - consumer, producer and market. Characteristics of consumers, role of consumers in the Indian economy. Malpractices - Incorrect weights and measures. Misleading Advertisement and Misbranding.	8
	Activity: Preparation of poster and creating awareness on various consumer buying problems.	2
UNIT II	Human wants Demand and Supply - Definition, classification of human wants - necessities, comfort and luxuries, Meaning of demand and supply. Relation between utility, demand and supply. Factors influencing demand and supply. Types of income - Real, money, psychic, relationship of GNP, national income, personal income, disposable income.	8
	Activity: Preparing guidelines for purchasing commonly used consumer goods and services.	2

<p>UNIT III</p>	<p>Markets and marketing - Basic Concept, Classification and functionsofMarkets, Typesof Market.ChannelsofDistribution:Meaning,typesandtheiradvantagesand disadvantages.</p> <p>Consumer in the market - Consumer buying habits, buying motivesandbuyingproblems.</p> <p>ConsumerAids</p> <p>a. Brand–Differenttypesand itsimportance.</p> <p>b. Labels– Importance,Meritsanddemerits.Importanceof PackagingandAdvertising.</p>	<p>15</p>
	<p>Activity:Illustratedifferenttypesofconsumeraids.</p>	<p>5</p>

UNITIV	Quality Assessment of Products -Definition–Standards and standardization and its Importance. Quality Seal– BIS, ISI, AGMARK, ISO, HALLMARK, BEELABEL and FPO	8
	Activity: Identify government agencies in protecting the consumer.	2
UNITV	Consumer decision making process - Types of consumer decisions, process of decision making, factors determining and influencing consumer behavior, guidelines for wise buying practices. Consumer Protective Services -Consumer Protection Act, Food Adulteration Act– FSSAI. Quality control and inspection Act. Consumer Rights and consumer responsibilities.	8
	Activity: Identify a consumer problem and solve it using decision making steps.	2
	Total	60

COURSE OUTCOME

After successful completion of the course the student will be able to:

- CO1.** Identify the major influences on consumer behavior.
- CO2.** Analyze the implications of demand and supply.
- CO3.** Implement wise buying practices.
- CO4.** Explain consumer protection legislations and standards.
- CO5.** Assess the quality of a product based on the knowledge gained.

REFERENCES:

1. Gupta, C.B. and Nair, R.N (2004). Marketing Management: Sultan Chand and Sons,
2. Juliana, M (2011). Green consumerism, United States: SAGE Publishers.
3. Kathiresan, S. Radha, V (2004), Marketing: Chennai, Prasanna Publisher.
4. Kumar, N., (1999), Consumer Protection in India, Delhi, Himalaya Publishing House.
5. Pattanchetti, C.C. and Reddy, (2002). Principles of Marketing, Coimbatore: Rainbow Publishers, India.
6. Seetharaman, P. and Sethi, M. (2001). Consumerism: Strategies and Tactics, CBS Publishers and Distributors, New Delhi.
7. Steven, D.S, (2016). Consumer Economics: A Practical Overview”, New York: Routledge Taylor and Francis group.
8. Suja Nair (2002). Consumer Behaviour: New Delhi. Sultan Chand and Sons.

E-LEARNING RESOURCES:

- <http://www.jagoharakjago.com/consumer-rights/>
- <https://consumeraffairs.nic.in/organisation-and-units/division/bureau-indian-standards>
- <https://www.consumer-voice.org/food/know-your-quality-marks/>
- <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=120087>

- <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=120086>
- <https://www.nios.ac.in/media/documents/srsec321newE/321-E-Lesson-17.pdf>
- <https://www.flexiprep.com/NIOS-Notes/Senior-Secondary/Home-Science/NIOS-Home-Family-and-Home-Science-Ch-16-Consumer-Education.html>

MappingwithProgrammeOutcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	S	S	L	S	S	S	S
CO2	S	S	S	S	S	M	M	S	S	S
CO3	S	S	S	S	M	M	S	S	S	M
CO4	S	S	M	M	S	M	S	S	M	S
CO5	S	S	S	S	S	M	S	S	S	S

MappingwithProgrammeSpecificOutcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weightedpercentage(roundedof)of CourseContributionto Pos	3	3	3	3	3

Title of the Course		FUNDAMENTALS OF RESEARCH IN NUTRITIONAL SCIENCES								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Skill Enhancement Course SEC – 5	III	Y				2	2	25	75	100

Learning Objectives
To enable the student to:
Understand basic concepts of research methodology.
Use simple statistical methods for analysis of data.
Develop skills to carry out a project and present a report

UNIT	CONTENT	HOURS
UNIT I	Introduction to research Research-Meaning, objectives, significance. Research problem- Definition and selection of research problem. Research design – Types of research design Methods of sampling-probability and non-probability sampling – Merits and demerits Determining sample size	15
UNIT II	Data Collection Primary and secondary data, selection of appropriate method for data collection. Tools used for data collection- Questionnaire and Interview schedule.	10
UNIT III	Coding and tabulation of data Data entry and computation, Tabulation of data – parts of the table Presentation of data-use of bar graph and pie chart	10
UNIT IV	Basic statistical tools for analysis and interpretation Measures of central tendency – Mean, Median, Mode. Variations- the range and standard deviation Correlation – Karl Pearson's coefficient of correlation Test of significance- Student's t test	15
UNIT V	Report writing Steps in report writing, Layout of a report. Bibliography-citing references- any one style.	10

	EXPERIENTIALLEARNING Carryoutasmallsurvey,codeandtabulatedataandpresentdatausingtablesandgraphs.Interpretdatausingsimplestatisticaltoolsandpresentreport followingrulesforreportwriting.	
	TOTAL	60

COURSE OUTCOMES

After successful completion of the course, the student will be able to:

CO1. Define terms associated with conduct of research.

CO2. Explain research design, methods of research, collection, tabulation and presentation of data.

CO3. Choose a sampling method and identify the appropriate statistical methods.

CO4. Analyze the data and draw conclusions.

CO5. Evaluate data, draw inferences and prepare a report.

REFERENCES:

- Goode, W.J and Hatt, P.K (1981) Methods in Social Research, McGraw Hill International Editions, Sociology Series.
- Gupta, S.P. (2019) Statistical methods. 46th ed. Sultan Chand and Co, New Delhi.
- Kerlinger F. N. and Lee, H.B. (2000) Foundations of Behavioural Research 4th Ed. Harcourt College Publishers.
- Kothari, C.R. (2019). Research methodology methods and techniques, New Age International publishers, New Delhi.
- Kumar, R. (2005) Research Methodology: A Step-by-Step Guide for Beginners. Sage Publications, New Delhi.

E-LEARNING RESOURCES:

- <http://www.socialresearchmethods.net/tutorial/mugo/tutorial.htm>
- https://ebooks.lpude.in/library_and_info_sciences/MLIS/year_1/DLIS401_METHODOLOGY_OF_RESEARCH_AND_STATISTICAL_TECHNIQUES.pdf
- <https://mfs.mkcl.org/images/ebook/Fundamental%20of%20Research%20Methodology%20and%20Statistics%20by%20Yogesh%20Kumar%20Singh.pdf>

Mapping with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	M	S	M	M	M	S	M	M	M	S
CO2	S	S	S	S	M	S	L	S	M	S
CO3	S	S	S	S	M	M	S	S	M	S
CO4	S	S	S	S	M	M	L	M	M	S
CO5	S	S	S	S	S	S	S	M	M	S

Mapping with Programme Specific Outcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3

CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weightedpercentage(rounded of) ofCourseContributiontoPos	3	3	3	3	3

SEMESTER IV

Title of the Course		NUTRITION THROUGH LIFECYCLE								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Core Course CC – VII	IV	Y		Y		4	4	25	75	100

Learning Objectives
To enable the students to:
Understand the role of nutrition in the growth and development through the lifecycle.
Gain insight into the principles of effective meal planning.
Understand the nutritional needs of various age groups
Acquire skills to plan diets for various age groups across the lifecycle.

UNIT	CONTENT	HOURS
UNIT I	Introduction to meal planning - Balanced diet, food groups, Food Guide Pyramid (ICMR), Food plate, RDA, factors affecting RDA. Principles of meal planning – steps involved in planning a diet. Nutrition for Adult - nutritional requirements, planning balanced diets for adult men and women, promoting healthy lifestyle through holistic approach.	15
UNIT II	Nutrition during pregnancy - Physiological demands of pregnancy, nutritional needs, effect of nutrition on pregnancy outcome, optimal weight gain, nutrition related problems in pregnancy, complications of pregnancy. Nutrition during lactation - Physiology of lactation, nutritional requirements, concerns of breast-feeding mother.	15
UNIT III	Nutrition during infancy - Growth and development, growth standards, food and nutritional requirements, breast feeding, artificial feeding, low birth weight babies, complementary feeds. Nutrition for preschool children - Growth and development, food and nutritional requirements, eating habits and food behaviors, nutritional related problems- PEM, VAD and their dietary interventions.	20
UNIT IV	Nutrition for school children - Growth pattern, nutritional requirement, importance of healthy snacks, factors affecting eating habits, school lunch. Nutrition during adolescence - Growth and development, nutritional requirements, food habits,	15

	nutritional problems –obesity, underweight, anaemia, menstrual problems and eating disorders.	
UNIT V	Nutrition for old age -Physiological changes in elderly, food and nutritional requirements, nutritional and health concerns in old age, healthy lifestyle.	10
	TOTAL	75

COURSE OUTCOMES

After successful completion of the course the student will be able to

- CO1.** Explain the physiological basis for nutritional needs through the human lifecycle
CO2. Identify nutrition related concerns and deficiency disorders at every stage of lifecycle
CO3. Discuss appropriate dietary guidelines for various age groups
CO4. Develop indigenous, value added and low cost complementary feeds.
CO5. Demonstrate skills to plan and prepare appropriate and sustainable diets for deficiency diseases

REFERENCE BOOKS

1. Srilakshmi B. (2011) Dietetics, sixth edition, New Age Publishing Press, New Delhi.
2. Gopalan, C., Ramanathan, P.V. Balasubramanian, S.C. (2001) Nutritive value of Indian foods, NIN, Hyderabad.
3. Longvah T, Ananthan R, Bhaskar K, Venkaiah K. (2017) Indian Food Composition Tables, National Institute of Nutrition.
4. Abraham S, Nutrition through Lifecycle. (2016) 1st edition, New Age International Publishers, New Delhi.
5. Stacy N, William's Basic Nutrition and Diet Therapy. (2005) 12th edition, Elsevier Publications, United Kingdom.
6. Whitney EN and Rolfes SR, Understanding Nutrition. (2002) 9th edition West/Wadsworth, London.
7. Groff JL, Gropper SS, Advanced Nutrition and Human Metabolism. (2000) 3rd edition, West/Wadsworth, United Kingdom.
8. Groff JL, Gropper SS, Advanced Nutrition and Human Metabolism. (2000) 3rd edition, West/Wadsworth, United Kingdom.
9. Cataldo, De Bruyne and Whitney, Nutrition and Diet Therapy – Principles and Practice. (1999) 5th edition, West/Wadsworth, London.

e-LEARNING RESOURCES

- <http://vikaspedia.in/health/nutrition/dietary-guidelines-1/dietary-guideline-1>
- <https://www.nhp.gov.in/healthyliving/healthy-diet>
- <https://motherchildnutrition.org/india/complementary-feeding-guidelines.html>
- <http://vikaspedia.in/health/nutrition/dietary-guidelines-1/diet-for-children-and-adolescents>

- <https://motherchildnutrition.org/india/complementary-feeding-guidelines.html>
- <https://sol.du.ac.in/mod/book/view.php?id=1422&chapterid=1288>

MappingwithProgrammeOutcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	S	S	M	S	M	S	S
CO2	S	S	S	S	S	S	S	M	S	S
CO3	S	S	S	S	S	S	S	M	S	S
CO4	S	S	S	S	S	S	S	M	S	S
CO5	S	S	S	S	S	S	S	M	S	S

MappingwithProgrammeSpecificOutcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weightedpercentage(roundedof) of CourseContributiontoPos	3	3	3	3	3

Title of the Course		NUTRITION PRACTICAL								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Core Course CC VIII	IV			Y		5	5	25	75	100

Learning Objectives

To enable the students to:

Acquire skills to assess nutritional status, plan diets for various age groups and deficiencies.

Understand the various analytical techniques in nutrition.

Develop analytical skills required in food and nutrition research.

UNIT	CONTENT	HOURS
UNIT I	1. Assessment of Nutritional Status <ol style="list-style-type: none"> a. -Body Composition parameters b. -Circumference measurements c. -Clinical signs d. -Dietary assessment 2. Planning and preparation of diets for deficiency diseases <ol style="list-style-type: none"> a. PEM b. Vitamin A deficiency c. Nutritional anemia 	15
UNIT II	1. Planning and preparation of diets for the following <ol style="list-style-type: none"> a. Complementary feed b. Pre-school child c. School going children d. Adolescents e. Adult f. Expectant mother g. Nursing mother h. Old age 	15
UNIT III	1. Ashing of food and preparation of ash solution <ol style="list-style-type: none"> a. Estimation of Iron in food b. Estimation of moisture content of foods 2. Estimation of calcium in food 3. Estimation of Vitamin C by titrimetric method	20
UNIT IV	1. Quantitative estimation <ol style="list-style-type: none"> a. Reducing sugar. b. Determination of Iodine and acid value in oil/fat 	15

	2. Qualitative tests for sugars-glucose, fructose, lactose, maltose and galactose. 3. Qualitative tests for proteins.	
UNIT V	1. Demonstration Experiments. Determination of fat content in food using Soxhlet method. Estimation of protein content in food by the kjeldahl method Estimation of total nitrogen in foods (Micro or Macro kjeldahl methods) 2. Visit to a food analytical lab	10
	TOTAL	75

COURSE OUTCOME

After successful completion of the course, the student will be able to:

- CO1.** Assess nutritional status of individuals, community and plan diets for deficiency diseases.
- CO2.** Develop skills to determine adequacy of nutrient intake, plan diets for different age groups.
- CO3.** Estimate nutrient content of selected foods with appropriate laboratory procedures.
- CO4.** Identify appropriate laboratory procedures suited for qualitative and quantitative experiments.
- CO5.** Acquire knowledge on laboratory experiments performed in food analytical lab.

REFERENCES:

1. Oser, D.I. (1979) Hawk's Physiological Chemistry. Tata-McGraw Hill Publishing Co., New Delhi
2. Plummer, D.T. (1987) Introduction to Practical Biochemistry. Tata-McGraw Hill Publishing Co., New Delhi
3. Raghuramulu, N., Nair, K.M. and Kalyanasundaram, S. (1983) A Manual of Laboratory
4. Sharma, B.K. (1999). 8th Ed. Instrumental Methods of Chemical Analysis. Gal Publishing House.
5. Srivastava, A. and Jain, P.C. (1986). 2nd, Ed. Chemical Analysis: An Instrumental Approach. S Chand and Company Ltd.
6. Techniques. NIN, Hyderabad
7. Varley, H.; Gowenlock, A.H. and Bell, M. (1980). 5th ed. Practical Clinical Biochemistry. Heinemann Medical Books Ltd.
8. Winton, A.L. and Winton, K.B. (1999). Techniques of Food Analysis. Allied Scientific

E-LEARNING RESOURCES:

- <http://www.merck.com/mmhe/seciz/ch155/ch155a.html>
- <http://www.whereincity/medical/vitamins>

MappingwithProgrammeOutcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	L	S	M	S	L	M	L	S	S
CO2	S	L	S	M	S	L	M	L	M	S
CO3	S	L	S	S	S	L	L	M	M	S
CO4	S	L	S	M	S	L	L	M	M	S
CO5	S	L	S	S	S	L	L	M	M	S

MappingwithProgrammeSpecificOutcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weightedpercentage(roundedof) ofCourseContributiontoPos	3	3	3	3	3

Title of the Course		FOUNDATIONS OF BAKING AND CONFECTIONERY								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Elective Course E C 4	IV	Y		Y		4 (2+2)	4 (2+2)	25	75	100

Learning Objectives
To enable the students to:
Gain insight into the planning and operation of bakery unit.
Familiarize with the equipment and tools, hygienic practices relating to baking
Understand the role of various ingredients used in the making of breads, cakes, cookies, pastries and various confectioneries
Acquire skills in baking and confectionery with an emphasis on special dietary needs.

UNIT	CONTENT	HOURS
UNIT I	An Overview of Bakery Industry 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.	10
UNIT II	Ingredients in Bakery and Confectionery 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.	10
UNIT III	Breads and Cakes Bread - ingredients, types of breads, faults and its prevention Cakes - ingredients, types of cakes, cake judging, faults and remedies. Modified baked goods – using alternative healthy ingredients for special dietary needs. Different types and techniques of cake decoration - icings and fillings.	15
UNIT IV	Pastries, Cookies and Biscuits Pastries - types of pastries- puff pastry, short crust, phyllo pastry, flaky pastry, choux pastry Cookies & biscuits - ingredients, types and processing.	10
UNIT V	Confectionery and Marketing of Baked Products Chocolates- production, types, chocolate decorations Sugar based confectionery – fudge, fondant, sugar candies. Marketing and sales promotion - costing, packaging and labeling.	10

	<p>PRACTICAL:</p> <ol style="list-style-type: none"> 1. Preparation of buns, rolls, soup sticks, rusk and pizza base. 2. Preparation of angel food cake, butter cake, sponge cake, chocolate cake, cupcake, fruit cake and icing on the cake. 3. Modified baked products - high fiber, low/alternate sugar, low fat, gluten free, and millet based bakery products for special nutritional requirements. 4. Preparation of biscuits, cookies. 5. Preparation of pastries - Shortcrust pastry, flaky pastry, puff pastry, choux pastry. 6. Preparation of plain chocolate, fudge, fondant and candies. 	20
	TOTAL	75

COURSE OUTCOMES

After successful completion of the course the student will be able

to CO1. Understand the principles and process of baking and confectionery.

CO2. Acquire knowledge on role of various ingredients used in baking and confectionery.

CO3. Develop skills to design baked goods using alternative healthy ingredients to cater to special dietary needs.

CO4. Acquire skill to bake pastries, cookies and biscuits.

CO5. Enhance entrepreneurial skills in bakery and confectionery to establish a bakery unit.

REFERENCES

1. John Kingslee (2006) A Professional Text book to Bakery and Confectionary. New Age International Pvt Limited Publisher, New Delhi.
2. Uttam K Singh (2011). Theory of Bakery and Confectionary - An Operational Approach. Kanishka Publishers and Distributors, New Delhi.
3. Yogambal Ashokkumar (2012) Theory of Bakery and Confectionary, PHI publication. New Delhi.
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7. Sarah R. Lebensky, Pricilla et al., (2004) Textbook of Baking and Pastry Fundamentals, third edition, Pearson Education Ltd.
8. The Culinary Institute of America, Baking & Pastry: Mastering the Art and Craft, John Wiley & Sons, Inc New Jersey. 2009.

e- LEARNINGRESOURCES

- <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

MappingwithProgrammeOutcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	S	M	S	M	M	M	S
CO2	S	S	S	S	M	M	S	M	M	S
CO3	S	S	S	S	S	S	S	M	S	S
CO4	S	S	S	M	M	M	L	L	M	S
CO5	S	S	S	S	S	M	S	S	S	S

MappingwithProgrammeSpecificOutcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weightedpercentage(roundedof) OfCourseContributiontoPos	3	3	3	3	3

Title of the Course		PRE-SCHOOL AND CRECHE MANAGEMENT								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Skill Enhancement Course SEC - 6	IV	Y		Y		2	2	25	75	100

Learning Objectives
To enable the students to:
To familiarize the students with the significance of managing the crèche and preschool
Understand the elements involved in organization and management of crèche and preschool.
Create awareness of functions of various authorities dealing with crèche and preschool.

UNIT	CONTENT	HOURS
UNIT I	Concept and organization of Creche and Preschool Crèche and preschool - Meaning, types of preschools, need, importance of organization, Elements of organization and administration. Difference between crèche and preschool, Preschool Programme - Principles of preschool programme, Framing of preschool curriculum – types of curriculum, planning activities for children, audio-visual aids for children and its importance, Activities for children: Audio-visual aid for children and its importance.	8
	Practical - Planning the layout of Creche and Preschool, Planning cyclic menu for a preschool and crèche	2
UNIT II	Resource Management Location, site and building, Types of rooms, Storage facilities, arrangement of room (activity centers), ventilation, lighting and safety, Provision of safe drinking water and sanitary facilities, Playground and safety aspects – indoor and outdoor games, Play equipment – types, criteria for selection, Maintenance of building-store, furniture, equipment Suggestive Low-Cost Educational Material- Teaching Aids	8
	Practical - Analyzing the availability and suitability of play materials Preparation of First Aid Box.	2
UNIT III	Records and registers Need, importance and maintenance of records and registers. Types of records (Important records) – Admission, Progress, Financial, Equipment, Correspondence, Health - sickness of child and immunization. Types of register - Attendance (Staff, children), Accounts, Stock, Staff Profile, services for children and daily diary. Methods of maintaining record of children – Cumulative and	12

	Anecdotal.	
	Practical -Casestudyofachild-Socio-economicprofile, Demographic details, Maintaining an activity dairy, Diet-meal pattern, health status Preparation and maintaining a health record file.	5
UNITIV	<p>Planning of Preschool Education Activities Skills & qualities of preschool children Introductory Games/activities for Rapport Building with Children</p> <p>Physical & Motor Development Gross Motor & Fine Motor Skills Essentials of Optimum Physical Development Activities/Games for Gross and Fine Motor Skills</p> <p>Cognitive Development Essentials for Cognitive Development Development of Basic Skills - Activities for Sensory Development, Mental Skills and Concept Development</p> <p>Language Development– Essentials for Language Development Games/Exercises for Language Development Activities for Language Development - Listening Skills, Reading Skills and Writing Skills</p> <p>Development of Science Experience & Creative Expression Areas of Creative Expression Science Experience Activities</p> <p>Social & Emotional Development Essentials for Social & Emotional Development Activities and games for Social-Emotional Development Games for Socio-Emotional Development</p>	15
	Practical -Planning activities for children based on the curriculum of the preschool and crèche	2
UNITV	<p>Personnel Management Role and qualities of teacher and care-taker and other staff involved in welfare and care of children, Teacher-child ratio, Need for and importance of in-service training</p>	4
	Practical - Organization chart for Crèche and Preschool, Collection of different records and registers to be maintained in a preschool and crèche	2
	TOTAL	60

COURSE OUTCOME

After successful completion of the course the student will be able to

- CO1.** Describe key Concept and organization of Creche and Preschool
- CO2.** Explain Resource Management for creche and preschools
- CO3.** Understand the criteria for Records and registers maintenance
- CO4.** Identify importance and Planning of Preschool Education Activities
- CO5.** Introduction to Personnel Management required for creche and preschools

Reference

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2. Clarke, P. (2001). Teaching & learning: the culture of pedagogy. New York: Sage
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4. Jaya, N., & Jayapoorani. N. (2004). Participation in a nursery school – Laboratory manual for students. Coimbatore: Saradalaya.
5. Tileston, D.W. (2005). Training Manual for Every Teacher, Chennai: Sage.
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e- Learning Resources

- https://ddceutkal.ac.in/Syllabus/MA_Education/Paper_19.pdf
- https://wcd.nic.in/sites/default/files/national_ece_curr_framework_final_03022014%20%282%29.pdf
- <https://scert.kerala.gov.in/wp-content/uploads/2020/06/07-creche%20and%20preschool.pdf>

Mapping with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	M	S	S	M	S
CO2	S	S	S	M	S	M	S	S	M	S
CO3	S	S	S	M	S	M	S	S	M	S
CO4	S	S	S	M	S	M	S	S	S	S
CO5	S	S	S	M	S	M	S	S	S	S

Mapping with Programme Specific Outcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage (rounded off) of Course Contribution to Pos	3	3	3	3	3

Title of the Course		COMPUTER APPLICATION IN HOME SCIENCE									
Category	Year	II	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem	IV							CIA	External	Total
Skill Enhancement Course SEC-7	IV		Y		Y		2	2	25	75	100

Learning Objectives
To enable the student to:
Understand the application of computer in various disciplines of Home Science.
Know the features of AutoCAD software used in Textiles & Interior Design.
Explore the benefits of computer applications in the field of research.

UNIT	CONTENT	HOURS
UNIT I	General commands- Creating and opening a file, Steps in creating a folder and saving a file in the destined folder. MS Office Package- Software in MS Office package, creating a document using MS Word, preparing slide presentation using MS PowerPoint. Making Graphs and Charts using MS Office.	5
UNIT II	Computer Application in Space planning - AutoCAD in Interior Design - Need, Purpose and merits. Application – Preparing Plan, Elevation and section drawings for interiors and exteriors. Need for rendered views in design. Creating 3D models and 3D views using Google Sketch up. Advantages of software in design field.	8
UNIT III	Computer Application in Nutrition - Software package in nutrition education and diet counseling- Patient's health record, Nutritive value of food items, Nutritional analysis, Meal planning and recipes, Types of nutrition Software – Nutrium, Nutrition maker, Nutritionist pro, Nutritics, Coreplus. Benefits of Nutrition Software to Nutritionists and Clients.	5
UNIT IV	Computer Application in Textiles- AutoCAD in Textile Designing – Definition, Concept, Application of CAD – Sketching, pattern making, grading patterns, Making markers, Apparel production. Types of Textile CAD software – Woven Textiles, Knitted Fabrics, Printed fabrics, Sketch Pads system, Texture mapping, Embroidery system, Apparel industry and computer. Advantages of Textile CAD.	7

UNIT V	Computer Application in Research -Data collection—creating online form using Google forms, Data entry in MS Excel and data analysis using SPSS – Frequency analysis, Cross Tabulation, Chi-Square, T –test, ANOVA and Correlation Co-efficient. Export and saving results in Word document. Creating Tables.	5
	Total	30

COURSE OUTCOMES

After successful completion of the course the

- Student will be able to:** **CO1:** Recall the features of MS Office package.
CO2: Understand the application of AutoCAD for design. **CO3:** Explain computer applications in the field of Nutrition. **CO4:** Create textile design patterns using Textile CAD
CO5: Analyze research data using appropriate software and interpret results.

REFERENCES:

1. AutoCAD 2018 for Novices (Learn By Doing), [CADSoftTechnologies](http://CADSoftTechnologies.com).
2. CAD Practical Skills in Textile Technology and Design (TTD), [Patience Chitura](http://PatienceChitura.com), 2020.
3. Microsoft Office 365 for Beginners 2022: [8 in 1] The Most Updated All-in-One Guide from Beginner to Advanced | Including Excel, Word, PowerPoint, OneNote, One Drive, Outlook, Teams and Access, James Holler.
4. SPSS Statistics for Data Analysis and Visualization, Jesus Salcedo, Wiley Publishers, 2017.

E-LEARNING RESOURCES:

- <https://www.tutorialspoint.com/word/index.htm>
- <https://www.vmaker.com/tutorial-video-hub/microsoft-tutorial-videos/microsoft-office-tutorial/>
- <https://www.thesourcecad.com/autocad-tutorials/>
- <https://nutrium.com/blog/why-should-you-choose-a-nutrition-software-over-an-excel-word/>

Mapping with Programme Outcomes:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	M	S	M	L	S	S	S	M	M	S
CO2	S	S	S	S	M	S	L	M	M	S
CO3	S	M	S	S	M	S	M	S	M	S
CO4	S	M	S	S	M	S	S	S	S	S
CO5	S	S	S	S	S	S	M	S	S	S

Mapping with Programme Specific Outcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3

CO3	3	2	3	3	2
CO4	3	3	3	3	2
CO5	3	3	3	3	2
Weightage	15	14	15	15	12
Weightedpercentage(roundedof ofCourseContributiontoPos	3	3	3	3	2

**THIRD YEAR
SEMESTER V**

Title of the Course		DIETETICS								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Core Course CC IX	V	Y				5	5	25	75	100

Learning Objectives
To enable the student to:
Understand the causes and symptoms and dietary management of various disease conditions.
Gain comprehensive knowledge on principles and planning of therapeutic diets
Acquire knowledge on nutritional needs of sick persons and develop aptitude and skills for Taking up dietetics as a profession

UNIT	CONTENT	HOURS
UNIT I	Concept of diet therapy and role of dietitian Principles of therapeutic diets, modification of normal diet, classification of therapeutic diets. Different feeding techniques- enteral and parenteral feeding.- Indications, contraindications and complications, Dietitian- Definition, role and code of ethics, classification of dietitians in nutritional care	20
UNIT II	Diseases of Gastrointestinal tract Etiology, symptoms, dietary management of: Diarrhoea, dysentery and constipation, Peptic ulcer, irritable bowel syndrome & inflammatory bowel disease (ulcerative colitis), Crohn's disease and celiac disease	20
UNIT III	Diseases of liver, gall bladder & febrile conditions Etiology, symptoms, dietary management of: Disease of liver & Gall bladder- Hepatitis, cirrhosis, gallstones Febrile conditions- Acute & Chronic fever (Typhoid, influenza, malaria, tuberculosis, COVID)	10
UNIT IV	Metabolic disorders Etiology, symptoms, and dietary management of: Obesity, PCOS, Diabetes mellitus- types, symptoms and metabolic changes, treatment with diet and insulin, GI, GL, carbohydrate counting, artificial sweeteners and complications Cardiovascular diseases- hypertension, atherosclerosis.	10

UNIT V	Diseases of excretory system and cancer Etiology, symptoms, dietary management of: Glomerular nephritis, Nephrotic syndrome, urinary calculi, renal failure. Cancer – Risk factors, modification of diet in cancer, nutritional problems of cancer therapy Role of antioxidants in prevention of degenerative diseases.	15
	SELF STUDY/ EXPERIENTIAL LEARNING Conduct a group discussion to understand various diseases and presentation of case-studies. Planning of various low-cost recipes using locally available ingredients for dietetics practical Conducting a nutrition exhibition to display sample menus for various diseased conditions for different sections of society.	
	Suggested Activity Internship in dietary unit of a hospital	
	TOTAL	75

COURSE OUTCOMES:

After successful completion of the course the student will be able to:

- CO1.** Explain concepts of diet therapy and role of dietitian.
- CO2.** Identify the etiology, symptoms and principles of dietary management for various diseases.
- CO3.** Apply the principles of dietetics to plan therapeutic diets for various disease conditions.
- CO4.** Examine the physiological condition of the individual and explain the role of foods and diet in treating that condition.
- CO5.** Summarize the causes, symptoms of a disease/ disorder and design a suitable diet plan using principles of nutritional management and recommend dietary allowances.

REFERENCES:

1. Antia F.P. (2002), Clinical Dietetics and Nutrition, 4th edition, Oxford University Press, Chennai.
2. Guthrie H.A, Picciano M.F (1995) Human Nutrition, Mosby, St. Louis Missouri.
3. Joshi. S.A. (2005), Nutrition and Dietetics, Tata McGraw-Hill Publishing Company Limited, New Delhi
4. Passmore R. and Davidson S. (1986) Human nutrition and Dietetics. Limingstone publishers
5. Sharma. A. (2017), Principles of Therapeutic Nutrition and Dietetics, CBS Publishers & Distributors Pvt Ltd, New Delhi.
6. Srilakshmi B, Dietetics (2019), 8th edition, New Age International Publishing Ltd, New Delhi

7. Williams S.R., (2000) Basic Nutrition and Diet Therapy, Mosby publication

E-LEARNING RESOURCES:

- https://www.cdss.ca.gov/agedblinddisabled/res/VPTC2/9%20Food%20Nutrition%20and%20Preparation/Types_of_Therapeutic_Diets.pdf
- <http://www.differencebetween.net/science/health/difference-between-enteral-and-parenteral-nutrition/>
- https://www.medicinenet.com/difference_between_diarrhea_and_dysentery/article.html
- <https://my.clevelandclinic.org/health/diseases/15587-inflammatory-bowel-disease-overview>

Mapping with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	M	L	L	M	M	M	L	S
CO2	S	M	S	M	L	S	M	S	M	S
CO3	S	S	S	M	L	S	M	S	L	S
CO4	S	S	S	S	M	S	S	S	S	S
CO5	S	S	S	M	M	S	S	M	S	S

Mapping with Programme Specific Outcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	3
CO2	3	3	2	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	13	15	15
Weighted percentage (rounded off) of Course Contribution to Pos	3	3	3	3	3

Title of the Course		FOODSERVICE MANAGEMENT								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Core Course CCX	V	Y		Y		4	5	25	75	100

Learning Objectives
To enable the students to:
Gain basic understanding of organizing and managing a food service institution.
Impart knowledge regarding purchase and storage of food to ensure quality service.
Familiarize with the layout of food service outlet and food service equipment.

UNIT	CONTENT	HOURS
UNIT I	Organization Management Types of Organization, Management - definition, principles, functions and tools of management - Tangible tools - organization chart, job description, job specification, job analysis, work schedule, Intangible tools - budget, leadership styles, decision making, and communication skills.	15
UNIT II	Personnel Management Definition, functions of personnel department, Recruitment - sources, Selection - steps, Induction - definition, methods, uses, Training - advantages, methods, supervision, performance appraisal, promotion, demotion, transfer, retirement, termination and dismissal of employees. Labor laws pertaining to the food service establishment.	15
UNIT III	Food Management Food purchase – purchasing process, functions of food buyer, methods of buying open market, formal, negotiated, wholesale, blanket order, contract. Storage in food service – types of stores, storeroom management, purchase, stores records - Physical and perpetual inventory order form, requisition slip, invoice, goods received book, stock book, bin card, stores ledger.	15
UNIT IV	Plant and equipment management Planning of food service unit - Layout of a food service, planning of storage, production and service areas, concepts of workflow and work simplification technique. Environmental hygiene - pest control - types of pests and pest control methods; garbage disposal method. Safety in food service institution - Accidents - causes and prevention. Equipment in food service - Classification of equipment,	15

	factors affecting selection of equipment.	
UNIT V	Financial Management Book-keeping –definition, advantages of double entry system, books of accounts – an introduction. Costing and Cost control: Basic cost concepts – elements of cost (material, labour, overheads), behavior of cost (fixed, variable, semi-fixed/semi-variable), methods of costing (Dish, meal, menu costing & costing for events), cost control, concept of break-even, break-even point. Pricing- factors affecting pricing, pricing methods (cost plus, factor, rate of return, subsidy, discount).	15
	Total	75

SELF STUDY/EXPERIENTIAL LEARNING

1. Group discussion and power point presentation, job descriptions, recruitment advertisements in print media/online sites.
2. Prepare resumes for job interview and conducting of mock interview.
3. Role plays of different leadership skills.

COURSE OUTCOMES

After successful completion of the course the student will be able to:

CO1. Apply the principles, tools of management to ensure effective functioning of organization.

CO2. Develop the managerial skills to select, train, appraise human resources. **CO3.** Recognize the use and operation of equipment and acquire skills in the selection of equipment, sketch sample layout of the food service units.

CO4. Evaluate and implement food safety and environmental sanitation in the workspace.

CO5. Use the basic concept of bookkeeping and elements of cost to assess the financial viability of the organization.

REFERENCES:

1. Andrews and Sudhir. (2000). Introduction to Hospitality Industry, Tata-McGraw Hill Pub. Co., New Delhi.
2. Dhawan and Vijay. (2001). Food and Beverage Service, Frank Boss and Co, New Delhi.
3. Foskett David. (2011). The Theory of Hospitality and Catering, Hodder Education, London.
4. Lillicarp, D.R. and Cousins, J. (2010). Food and beverage Service, 8th edition, Hodder Education, London.
5. Sethi, Mohini, Malhan, Surjeet. (2015). Catering Management – An Integrated Approach, 3rd edition, New Age International Publishers, New Delhi.
6. Suganthi, V and Premakumari, C. (2017). Food Service Management, Dipti Press (OPC) Pvt

.Ltd,Chennai.

7. Verghese and Brian. (2000). Professional Food and Beverage Service Management,MacmillanIndiaLtd.,India.

e- LEARNINGRESOURCES

- <http://open.lib.umn.edu/principlesmanagement/chapter/1-5-planning-organizing-leading-and-controlling-2/>
- https://www.managementstudyguide.com/management_functions.htm
- <http://www.bngkolkata.com/web/food-and-beverage-service-equipment/>
- <http://www.fcijammu.org/food/food/orders/F&B%20Service-Unit-2.pdf>
- <https://www.scribd.com/doc/29362905/Equipments-in-Food-amp-Beverage>

MappingwithProgrammeOutcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	M	M	M	M	S
CO2	S	S	S	S	S	M	S	S	S	S
CO3	S	S	S	S	S	M	S	M	M	S
CO4	S	S	S	S	S	M	S	M	M	S
CO5	S	S	S	S	S	M	M	M	M	S

MappingwithProgrammeSpecificOutcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weightedpercentage(roundedof) ofCourseContributiontoPos	3	3	3	3	3

Title of the Course		PUBLIC HEALTH NUTRITION								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Core Course CCXI	V	Y		Y		3	4	25	75	100

Learning Objectives
To enable the students to:
Gain knowledge about nutritional policies, programs and agencies involved in combating malnutrition.
Acquire knowledge and skills in assessment of nutritional status.
Create awareness on improving health and nutrition of the community

UNIT	CONTENT	HOURS
UNIT I	<p>Concept and scope of public nutrition Definition, concept, scope and multidisciplinary nature of public nutrition</p> <p>Nutritional problems affecting the community. Etiology, prevalence, clinical features and preventive strategies for malnutrition related problems and deficiency disorders- Undernutrition (Protein energy malnutrition, Wasting, Stunting), Overnutrition (obesity and related risks), Nutritional anemia, Vitamin A deficiency, Iodine deficiency disorders, Fluorosis.</p>	15
UNIT II	<p>Assessment of nutritional status Objectives and importance, Methods of assessment: Direct (Clinical signs, Anthropometry, Biochemical tests); Indirect (Diets surveys, vital statistics)</p>	10
UNIT III	<p>Nutrition policy and programs National nutritional policy; Integrated child development scheme (ICDS), Mid-day Meal Program- State and National (Poshan Abhyan), National programs for the prevention of anemia, Vitamin A deficiency, Iodine deficiency disorders, Fortification of Foods and Public Distribution System as a preventive approach.</p>	15

UNITIV	Nutritioneducation Objectives,principlesandscopeofnutritionandhealtheducation, creating awareness on current public health issuesanddevisingstrategies for preventionandmanagement.	10
UNITV	Role of National and International agencies in combatingmalnutrition WHO,FAO, UNICEF; National: FSSAI, ICAR, ICMR, NIN, FNB, CFTRI, NNMB- Role, Target groups (ifspecified),PoliciesandPrograms.	10
Practical	Practical/experientiallearning Planning low-costnutritious recipes for infants, pre-school children,and pregnant/lactatingmothersfornutritioneducation.Assessmentof nutritionalstatus <ul style="list-style-type: none"> - Anthropometry: Weightandheightmeasurements - Plottingandinterpretationofgrowthchartsforchildrenbelow5years - Identificationofclinicalsignsofcommonnutritionaldisorders - Dietary assessment: 24-hour recall, Food FrequencyQuestionnaire, Diet DiversityScore PlanningaNutrition EducationProgram,andimparting nutritioneducationtothecommunity	15
	TOTAL	75

COURSEOUTCOME

After successful completion of the course, the student will be able to:

CO1. Define terms related to Public Health nutrition.

CO2. Describe the nutritional problems prevalent in the community.

CO3. Explain the significance of assessment of nutritional status.

CO4. Assess the role of various organizations in combating nutritional problems.

CO5. Conduct nutrition education program to create awareness on improving health and nutrition of the community at large.

REFERENCE:

1. Wadhwa A and Sharma S (2003). Nutrition in the Community - A text book. Elite Publishing House Pvt. Ltd. New Delhi.
2. Park K (2011). Park's Textbook of Preventive and Social Medicine, 21st Edition. M/s Banarasi Das Bhanot Publishers, Jabalpur, India.
3. Jelliffe DB, Jelliffe ERP, Zervas A and Neumann CG (1989). Community nutritional assessment with special reference to less technically developed countries. Oxford University Press. Oxford.
4. WHO (2006). Child Growth Standards: Methods and development: height- for-

age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age(<http://www.who.int/childgrowth/standards/en/>).

5. Gupta,

MC.AndMahajanBK.(2003)TextbookofPreventiveandSocialMedicine3rdEd
JaypeeBrothers,Medical Publishers (p) Ltd.

E- LEARNING RESOURCES

- [Mohfw.nic.in/NRHM/NIDD](http://mohfw.nic.in/NRHM/NIDD)
- www.nrhmorissa.gov.in/NIDDCP.html
- www.Scripts.mit.edu

MappingwithProgrammeOutcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	L	L	L	L	S	L	L	S
CO2	S	S	S	S	M	S	S	S	M	S
CO3	S	S	S	S	M	S	S	S	M	S
CO4	S	S	S	S	M	M	S	S	M	S
CO5	S	S	S	S	S	S	S	S	S	S

MappingwithProgrammeSpecificOutcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	1	3
CO2	3	3	3	3	3
CO3	3	3	2	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	14	14	13	15
Weightedpercentage(roundedof) ofCourseContributiontoPos	3	3	3	3	3

Title of the Course		FOOD PRESERVATION AND PROCESSING								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Elective Course – EC 5	V	Y		Y		3	4	25	75	100

Learning Objectives
To enable the students to:
Gain knowledge on principles of food preservation of foods
Understand the techniques used in processing foods to preserve their shelf life
Apply skills learnt to develop preserved food product

UNIT	CONTENT	HOURS
UNIT I	Food Spoilage - Definition, causes, and microorganisms involved in spoilage of bread, fruits and vegetables, meat, fish, egg, milk, juices and pickles. Food preservation - Definition, principles and importance, classification bactericidal and bacteriostatic methods.	13
UNIT II	Processing by high temperature Processing and preservation by high temperature: blanching, pasteurization, sterilization and UHT processing, canning, extraction cooking, dielectric heating, Dehydration.	12
UNIT III	Processing by low temperature Processing and preservation by low temperature – refrigeration, freezing, dehydro-freezing.	10
UNIT IV	Preservation by drying Processing and preservation by drying, concentration and evaporation: various methods sun – drying, tray or tunnel drying, spray drying, drum drying, freeze drying, fluidized bed drying, advantages and disadvantages.	10
UNIT V	Preservation by non - thermal treatments and food packaging Processing and preservation by non-thermal methods: salt, sugar, chemicals, smoking. Irradiation Food additives: Definition, types and functions, permissible limits and safety aspects. Food packaging- its types and uses	20
	Practical - Preparation of jams, jellies and squashes using seasonal fruits and vegetables. Preparation of pickles using fruits and vegetables. Preparation of sauce and ketchup.	10
	TOTAL	75

COURSE OUTCOMES

After successful completion of the course the student will be able to:

CO1. Define and explain the principles of food preservation and relate the role of microorganisms in food spoilage.

CO2. Explain the causes of food spoilage, need and principles of food preservation. **CO3.** Apply the various techniques of food preservation to preserve different foods so as to increase the shelf life of foods.

CO4. Compare the principles and techniques of various food preservation methods and explain the role of packaging in food processing.

CO5. Justify the use of various preservation techniques, and packaging materials describe the terms related to food preservation and classify foods based on the shelf life.

REFERENCE:

1. Arthey, D and Ashurst, P.R (1996), Fruit processing, Blackie academic and professional. London.
2. Fellows, P.J (2016): Food Processing Technology: Principles and Practice, second edition, CRC Woodhead publishing Ltd, Cambridge.
3. Gould, G. W (1995), New methods of food preservation. Blackie academic and professional. London.
4. Rahman MS (2020) Handbook of Food Preservation CRC Press, USA
5. Srilakshmi B (2017) Food Science, New Age International Publications, New Delhi.
6. Suganthi. V and Subaratinam. R (2021) Textbook on Food preservation, Dipti Press (OPC) Pvt. Ltd, Chennai.

E- LEARNING RESOURCES

- <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/food-spoilage>.
- <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=111436>
- <http://ecoursesonline.iasri.res.in/mod/page/view.php?id=111435>
- <http://www.homepreservingbible.com/2247-an-introduction-to-the-drying-food-preservation-method/>

Mapping with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	S	M	M	M	L	M	M	S
CO2	S	S	S	M	M	M	M	M	M	S
CO3	S	S	M	S	M	M	M	M	M	S
CO4	S	S	S	M	M	M	M	M	M	S
CO5	S	S	M	M	M	M	S	M	M	S

MappingwithProgrammeSpecificOutcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weightedpercentage(roundedof)of CourseContributionto Pos	3	3	3	3	3

Title of the Course		INTERIOR DECORATION								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Elective Course – EC 6	V	Y		Y		3	4	25	75	100

Learning Objectives
To enable the students to:
Develop innovative ideas in the use of interior accessories and flower arrangements.
Analyze and implement the appropriate furniture styles and lighting fixtures for interiors and exteriors.
Apply Decorative styles in interiors and exteriors.

UNIT	CONTENT	HOURS
UNIT I	<p>Accessories - Definition, Types of accessories, Selection and arrangement of accessories in various areas – living room, Dining room, bedroom, study room with application of art principles and elements of design.</p> <p>Pictures – Concept, Selection of pictures, framing and mounting of pictures – glass, mat backing, frame, pictures. Types of picture frame – Shadow box, decorative, standard, floating and collage. Hanging law of margin in picture framing.</p>	10
	Practical: Creating hand-made accessories using waste materials and picture frames in different styles.	5
UNIT II	<p>Flower Arrangement- Definition, importance of flower arrangement, Styles of flower arrangement – Traditional, Oriental/Japanese styles - Ikebana, Moribana, Nagarie, Shikibana, Morimono, Rikka, Ukibana and Modern. Selection of containers based upon styles of arrangement.</p> <p>Flowers – Names, its colours, textures and its visual perception in various indoor spaces.</p>	10
	Practical: Creating different shapes and types of flower arrangement.	5
UNIT III	<p>Furniture Arrangement- Styles of furniture – traditional, contemporary and modern design.</p> <p>Furniture for different purpose, furniture materials. Selection and arrangement – Furniture for various rooms – Living, dining, bedroom, kitchen, study room, office. Furniture - Dimensions, Care and maintenance.</p>	10
	Practical: Planning layout showing furniture arrangement for various areas of interiors.	5

UNITIV	Lighting -Lightingrequirements- DefinitionandImportanceoflighting.Ideallightrequirements, Typesoflighting-General/Ambientlighting, Task/Spotlighting,Architecturallighting- valance,soffit,bracket,cone,recessed, cornice. Lighting fixtures – Movable and immovable fixtures.Principlesofhomelighting,Glare- typesandcausesofglare. Suggestionsfor improvingdaylightillumination.	10
	Practical: DrawlightinglayoutandMarketsurveyonlightandlighting fixtures.	5
UNITV	Decorative Styles – ConceptandCharacteristicfeaturesofContemporary,Modern,Traditional, TransitionalandEclecticstyles.Walldcoration– Origin,Motifs,StylesandTechniqueofMadhubhani, Warli,Pithora, Frescoand Tempera.	10
	Practical: DesigningwallbyWarliart.	5
	Total	75

COURSE OUTCOMES

After successful completion of the course the student will be able to:

CO1:Select accessories and arrange pictures suited to the background of interiors

CO2: Creating innovative flower arrangements in accordance to the occasion and needs

CO3:Apply the principles of furniture arrangement in various areas of Interiors.

CO4:Apply proper lighting for efficient lighting in interiors and exteriors.

CO5:Use decorative styles and wall decoration techniques appropriately in various rooms.

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1. Andal and Parimalam (2015), "A Textbook of Interior Decoration", Satish Serial Publishing House, ISBN-13: 978-8189304508
2. Frida Rams tedt, (2020), "The Interior Design Handbook", Particular Books, ISBN-13:978-0241438114
3. Gary Gordon (2015), "Interior Lighting for Designers", Wiley; 5th edition, ISBN-13:978-0470114223
4. Grimley C and Mimi Love (2018), "The Interior Design Reference & specification Book", Rockport Publishers, ISBN-13978-1631593802:
5. Mark Karlen, Christina Spangler, et al (2017), "Lighting Design Basics", Wiley; 3rd edition, ISBN-13: 978-1119312277
6. Nikita Mittal (2021), "The Key of Interior Design (Illustration of Methods & Principles)", STANDARD BOOK HOUSE; 1st edition, ISBN-13:978-8194359753
7. Pratap Rao. M (2020), "Interior Design: Principles and Practice", Standard Publisher and Distributors Pvt Ltd, ISBN-13: 978-8180141560

8. SeethaeamanP(2019),“InteriorDesign andDecoration”,CBS;1stedition,ASIN:8123911920,ISBN-13 :978-8123911922

E-LEARNINGRESOURCES:

- Greg Batten (2015), “Lighting Control Methods”,<https://www.controlco.com.au/blog/2015/7/16/lighting-control-methods>
- Frankel Building Group (2021), “7 Elements of Interior Design”,<https://www.frankelbuildinggroup.com/resources/7-elements-of-interior-design/>
- PrernaMakhija (2022), “The 7 Elements of Design – and how to use them in your homeinteriors”,<https://www.beautifulhomes.com/home-decor-ideas/interior-design/the-7-elements-of-design-and-how-to-use-them-in-your-home-interiors.html>
- Foyr(2020),“ImportanceofAccessoriesinInteriorDesign”,<http://foyr.com/learn/accessories-in-interior-design/>
- Hamstech (2021), “Selection of Accessories in Interior Designing”,<https://www.hamstech.com/selection-of-accessories-in-interior-designing>

MappingwithProgrammeOutcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	M	L	M	L	S	L	L	S
CO2	S	L	L	S	S	L	L	M	L	S
CO3	S	L	L	S	S	L	L	M	L	S
CO4	S	L	M	S	S	S	M	L	M	S
CO5	S	S	S	S	S	S	S	S	S	S

MappingwithProgrammeSpecificOutcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weightedpercentage(roundedof) ofCourseContributiontoPos	3	3	3	3	3

Title of the Course		INTERNSHIP IN HOSPITALS/FOOD INDUSTRY/CATERING ESTABLISHMENT/HEALTH CARE FACILITY/FITNESS CENTRE/NGO/INTERIOR DESIGN FIRM								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Internship	V				Y	2	2	25	75	100

**The students are expected to undergo an internship for a minimum of 15 days at any one of the following: Hospital / Health care facility / Fitness Centre / Food Industry / Catering Establishment/ NGO/Interior Design Firm.

Learning Objectives
To enable the students to:
The internship is committed to preparing graduates in Home Science to join as entry level Dietitians/Nutritionists/Food Analysts/ Catering Staff/ Interior Designer

EXPECTED OUTCOME OF INTERNSHIP AT HOSPITAL/HEALTH CARE FACILITY/FITNESS CENTRE

On completing the internship, the student:

- Learn the functions of the Dietary Department/Healthcare facility/Fitness Centre
- Gets acquainted with the role and responsibilities of a Dietitian/Nutritionist in the respective facility
- Develop skills in nutrition screening and assessment of patient/client
- Acquire training in nutritional diagnoses of each patient/client
- Demonstrates the ability to implement nutrition care plans; document nutrition care provided, maintain internship logbook and monitor outcomes of the nutrition plan

EXPECTED OUTCOME OF INTERNSHIP AT CATERING ESTABLISHMENT

On completing the internship, the student:

- Gain knowledge about the functions and operations of a catering establishment
- Develop managerial skills in the areas of managing kitchen, organizing stock, cooking schedules and customer service.
- Learn the strategies used in cost control
- Be trained in menu management and recipe development
- Learn the culinary art of planning, preparing and serving food that is delicious and appealing.
- Be familiar with the standards of safety and hygiene followed in the industry/company

EXPECTED OUTCOME OF INTERNSHIP AT FOOD INDUSTRY/NUTRACEUTICAL COMPANY

On completing the internship, the student:

- Learn the organizational setup and the process flow in manufacturing goods/delivering services
- Get hands on experience in serving in the various departments from procurement to end delivery of finished product
- Develop managerial skills to maintain stock, ensure smooth flow in production/services rendered
- Acquire the ability to work in a team
- Learn the quality standards laid by the industry/company and efforts taken to meet these standards

EXPECTED OUTCOME OF THE INTERNSHIP AT INTERIOR DESIGN FIRM

On completing the internship, the student:

- Gain knowledge about industry/company process.
- Develop skills in 2D and 3D software.
- Analyze cost estimation of building materials and finishes.
- Learn the methods and strategies used in cost control.
- Develop managerial skills in the areas of managing works required by the client.
- Adapt to working in a team and contribute to needs as they arise.
- Demonstrate competency in professional presentation, communication and writing skills.

Mapping with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	S	S	S	S	S	S
CO2	S	S	S	M	S	S	S	S	S	S
CO3	S	S	S	M	S	S	S	S	S	S
CO4	S	S	S	M	S	S	S	S	S	S
CO5	S	S	S	M	S	S	S	S	S	S

Mapping with Programme Specific Outcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage (rounded off) of Course Contribution to Pos	3	3	3	3	3

SEMESTER –VI

Title of the Course		QUANTITY FOOD PRODUCTION AND SERVICE								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Core Course CC XII	VI	Y		Y		4	4(2+2)	25	75	100

Learning Objectives
To enable the students to:
Acquaint with the type and operation of food service establishments.
Familiarize with the different types of menus and styles of service.
Foster entrepreneurship skills.

UNIT	CONTENT	HOURS
UNIT I	Food Service Industry History of development of food service institution in India. Classification of food service establishments – Commercial-Transport catering, Hotels, Restaurants, Outdoor catering and Non-commercial/Welfare-Hospital, Institutional-School/College, Orphanage/Old age homes, prisons, Industrial catering. Food Service systems -conventional, ready-prepared, commissary, assembly-serve.	10
UNIT II	Quantity food production Production forecasting, planning, production scheduling; Standardization of recipes definition, need, uses, methods of enlargement of recipes. Portion control, effective use of left-overs.	10
UNIT III	Menu Planning Menu – origin, definition and functions of menu, importance of planning menus, factors affecting menu planning, French classical menu. Types of menu - A la carte, Table d' hote, Du jour, static, cyclic, single use, construction and writing menu, menu display. Basic terminologies in food service relating to stocks, soups, sauces, salads and beverages-alcoholic and non-alcoholic.	10
UNIT IV	Food and Beverage Service Table Setting - Mise-en-scene, Mise-en-place, Basic rules for laying a table, Cover – definition, A la Carte cover and Table d' hote cover. Food service personnel: basic technical skills, interpersonal skills, attributes of food and beverage personnel. Duties of a waiter- before guests arrive, when guests arrive, during the meal and after guests leave, rules for waiting at table.	15

	Styles of Service - Table Service - Waiter – Silver / English, Family, American, French, Russian, Gueridon; Bar Counter, Assisted-Carvery, Buffet, Self-service-Cafeteria-Counter, Free-flow, Echelon, Supermarket, Single-point Service-Takeaway, Drive-thru, Fastfood; Vending; Kiosks; Foodcourt, In-situ Service-Tray, Trolley, Home delivery, Lounge, Room, Drive-in.	
UNIT V	Entrepreneurship in catering Entrepreneurship – concept and significance Entrepreneur – definition, characteristics and classification. Food startup, Start-up process, steps, opportunities and challenges, problems faced by women entrepreneurs.	10
	PRACTICAL 1. Plan menu for different types of food service institutions- commercial and non-commercial food service institution 2. Preparation of menus for different types of events. 3. Preparation and standardization of dishes of different cuisines (on a portion). 4. Quantity production and service of meals - stepping up of recipe to 50 portions. 5. Table Setting – Cover-A la carte and Table d’hotecovers. 6. Napkin folding. 7. Visit to food service units – commercial and non-commercial. 8. Organize food sales. 9. Internship in food service establishment for a month.	20
	TOTAL	75

COURSE OUTCOMES

After successful completion of the course the student will be able to

CO1. Identify and differentiate the types of food service sectors.

CO2. Develop skills to formulate and standardize recipes from various cuisines.

CO3. Demonstrate skills in quantity food production.

CO4. Distinguish various styles of service and identify the basic technical skills, and interpersonal skills required for food service.

CO5. Identify the entrepreneurial ventures in food production and service.

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2. June Payne-Palacio, Monica Theis, Introduction to Foodservice (2009), 11th illustrated, Published by Pearson / Prentice Hall.
3. Dhawan and Vijay. (2001). Food and Beverage Service, Frank Boss and Co, New Delhi.
4. Suganthi, V and Premakumari, C. (2017). Food Service Management, Dipti Press (OPC) Pvt. Ltd, Chennai.

5. Andrews and Sudhir. (2000). Introduction to Hospitality Industry, Tata-McGraw Hill Pub. Co., New Delhi.
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7. Gupta, C B and Srinivasan, N P. (2002) Entrepreneurial Development, Sultan Chand & Sons, New Delhi.
8. Jagmohan. N. (2013). Food and Beverage Service Operation, S. Chand & Co. Ltd., New Delhi.

e- LEARNING RESOURCES

- <https://www.scribd.com/document/119449120/History-of-Food-Service-Industry>
- <https://sirvo.com/>
- <https://www.yaaka.cc/unit/types-of-catering-establishment/>
- <https://www.scribd.com/doc/24003230/Unit-1-Food-and-Beverage-Service-Management>
- <https://www.universalclass.com/.../types-of-service-and-table-settings-in-waiter>

Mapping with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	M	M	S	M	M	S
CO2	S	S	S	S	S	M	S	S	S	S
CO3	S	S	S	S	S	M	S	M	M	S
CO4	S	S	S	M	S	M	S	M	M	S
CO5	S	S	S	S	S	M	S	M	S	S

Mapping with Programme Specific Outcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weighted percentage (rounded off) of Course Contribution to Pos	3	3	3	3	3

Title of the Course		DIETETICS PRACTICAL								
Category	Year	L	T	P	O	Credits	InstHrs	Marks		
	Sem							CIA	External	Total
Core Course CC XIII	VI			Y		5	6	25	75	100

Learning Objectives
To enable the student to:
Gain knowledge and develop skills and techniques in planning and preparation of therapeutic diets.
Plan diets based on the medical history of the patients and nutritional assessments – anthropometric measurements
Calculate the nutrient content of diets

UNIT	CONTENT	HOURS
UNIT I	Planning, Calculation of nutrient content, Preparation and Service of diets for: Tube feeds for special conditions Fever – Typhoid and Tuberculosis	20
UNIT II	Planning, Calculation of nutrient content, Preparation and Service of diets for: Peptic Ulcer Diarrhoea and constipation	10
UNIT III	Planning, Calculation of nutrient content, Preparation and Service of diets for: Viral hepatitis Cirrhosis of liver	20
UNIT IV	Planning, Calculation of nutrient content, Preparation and Service of diets for: Obesity Diabetes Mellitus Atherosclerosis	10
UNIT V	Planning, Calculation of nutrient content, Preparation and Service of diets for: Hypertension Chronic kidney disease	15
	TOTAL	75

SELFSTUDY/EXPERIENTIALLEARNING

1. Initiate diet counseling center in the institution for students, teaching, and non-teaching faculty.
2. Conduct exhibitions to display diets for various disease conditions.
3. Prepare pamphlet indicating food to be included/avoided/restricted in different disease conditions.
4. Commemorate days such as World Diabetes Day, World Heart Day and organize Seminars and awareness programs.

COURSE OUTCOMES:

After successful completion of the course the student will be able to: CO1. List the principles of dietary management for various conditions.

CO2. Calculate the nutrient content of the diet for various conditions and compare it with the recommended allowances

CO3. Apply the principles of dietary management in planning diets for various conditions

CO4.

Justify choice of foods, preparation methods, content, and consistency for different disease conditions

CO5. Plan and prepare diets for various disease conditions.

REFERENCES:

1. Antia, F.B. (2010), Clinical Nutrition and Dietetics, Oxford University Press, London.
2. IDA. (2018), Clinical Dietetic Manual, 2nd edition, Elite Publishing House, New Delhi
3. Sri Lakshmi. B., (2019) Dietetics, 8th Ed, New Age International Pub. Co, Chennai.
4. Vimala V. (2010). Advances in Diet Therapy, 1st Ed., National Institute of Nutrition – Hyderabad.
5. Williams S.R, (2000) Basic Nutrition and Diet Therapy, Mosby publication.
6. Sharma. A. (2017), Principles of Therapeutic Nutrition and Dietetics, CBS Publishers & Distributors Pvt Ltd, New Delhi.
7. Bajaj. M (2019) Diet Metrics: Handbook of Food Exchanges, Norton Press, Chennai.

Mapping with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	L	L	L	M	L	L	S
CO2	S	S	S	S	S	S	M	M	M	S
CO3	S	S	S	S	S	S	S	S	L	S
CO4	S	S	S	S	M	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

Mapping with Programme Specific Outcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	3
CO2	3	3	3	3	3
CO3	3	3	2	3	3

CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	13	14	15
Weightedpercentage(roundedof)of CourseContributionto Pos	3	3	3	3	3

Title of the Course		CLINICAL NUTRITION								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Core Course CCXIV	VI	Y		Y		3	6	25	75	100

Learning Objectives
To enable the students to:
Understand the etiology, physiological and metabolic anomalies of acute and chronic diseases and patient needs.
Understand the biochemical changes of the disorder and to learn the clinical significance of biochemical findings.
Be familiar with recent advances in the clinical nutritional management of various diseases

UNIT	CONTENT	HOURS
UNIT I	Biochemical changes due to disorders of metabolism Metabolic and Nutritional implications in Diabetes mellitus, Inborn errors of metabolism – Gout, phenylketonuria, Galactosemia, Lactose intolerance, Ageing – physiological changes with ageing. Cellular adaptation to stress	15
UNIT II	Cardiovascular Disorders Metabolic and Nutritional implications of Myocardial infarction, atherosclerosis, hyperlipidemia, hypertension, metabolic syndrome, Role of lipids in cardiovascular disease and Recent advances.	15
UNIT III	Digestive System, Liver and Pancreatic Disorders Metabolic and Nutritional implications of Diarrhoea, constipation. Gastritis, ulcers, colitis, malabsorption syndrome, celiac disease, Inflammatory bowel disease, Irritable bowel syndrome, Diet and gut microflora. Recent advances. Metabolic and nutritional implications of Hepatitis. Cirrhosis of liver, Hepatic coma, Pancreatitis, Cholecystitis and Cholelithiasis. Recent advances	20
UNIT IV	Renal Disorders Metabolic and nutritional implications of Nephritis, Nephrotic syndrome, Renal Transplant, Nephrolithiasis and Dialysis. Role of kidney in Water and Electrolyte Balance and Imbalance.	15

UNITV	Carcinogenesis Carcinogens in Food, Types of cancer, Causes, pathogenesis, cancer cachexia, Effect of cancer on metabolism and nutritional status, Recent developments in nutrition and cancer.	10
	Total	75

COURSE OUTCOMES

After successful completion of the course the student will be able to:

- CO1.** Describe the biochemical changes due to disorders of metabolism
- CO2.** Comprehend the metabolic and nutritional intervention of various disorders.
- CO3.** Evaluate and formulate dietary recommendations and customized diet plans based on clinical condition.
- CO4.** Illustrate the etiology, manifestation and assessment of diseases of the heart, liver, gall bladder, kidneys and gastrointestinal tract.
- CO5.** Exhibit skills in qualitative and quantitative estimation of blood and urine samples.

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1. Schlenker, E., & Gilbert, J.A., (2018), Williams' Essentials of Nutrition and Diet Therapy - E-Book. Elsevier Health Sciences.
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4. Carol Byrd-Bredbenner, (2013), Wardlaw's perspectives in Nutrition, 9th edition McGraw-Hill International Edition.
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7. Antia F.P., Abraham P., (2002), Clinical Dietetics, 4th edition, Oxford Publishing Company.
8. Whitney, E., & Rolfes, S.R., (2018), Understanding nutrition. Cengage Learning.

E-LEARNING REFERENCES

- <https://www.nutrition.gov/>
- <https://nutrition.org/>
- [Nutrition Resources for Online Learning \(healthyeating.org\)](https://www.healthyeating.org/)

Mapping with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	M	S	L	L	M	S
CO2	S	S	S	M	M	S	L	L	M	S
CO3	S	S	S	M	M	S	L	L	M	S
CO4	S	S	S	M	M	S	L	L	M	S
CO5	S	S	S	M	M	S	L	L	M	S

MappingwithProgrammeSpecificOutcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weightedpercentage(roundedof)of CourseContributionto Pos	3	3	3	3	3

Title of the Course		FUNCTIONAL FOODS AND CHRONIC DISEASES								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Elective Course EC 7	VI	Y				3	5	25	75	100

Learning Objectives
To enable the students to:
Gain basic understanding of functional foods and their use in managing chronic diseases.
Understand the properties and functions of active compounds in functional foods.
Identify the potential sources of functional foods that could be beneficial in the management of specific chronic diseases.

UNIT	CONTENT	HOURS
UNIT I	<p>Introduction Functional foods - Definition, History, types and classification of functional foods, Relation of functional foods (FF) to chronic diseases.</p> <p>Food sources Functional foods in different foods: cereal products (oats, wheat bran, rice bran, etc.), fruits and vegetables, milk and milk products, legumes, nuts, oil seeds and seafoods, herbs, spices and medicinal plants. Coffee, tea and other beverages as functional foods/drinks and their protective effects.</p>	15
UNIT II	<p>Antioxidants Concept of free radicals and antioxidants, antioxidant role as functional foods. Antioxidant and chronic diseases.</p> <p>Properties and functions of various functional food ingredients Protein, complex carbohydrates (dietary fiber) as functional food ingredients; probiotic, prebiotics and symbiotic foods, and their functional role. Sources and role of isoprenoids, isoflavones, flavonoids, carotenoids, tocotrienols, chlorophyll, polyunsaturated fatty acids, lecithin, choline, terpenoids, Glucosamine, lycopene, proanthocyanins.</p>	15
UNIT III	<p>Functional foods and cardiovascular diseases (CVD) Epidemiology of cardiovascular diseases, Biomarkers of different cardiovascular diseases, effect of functional foods on biomarkers of CVD, Effect of functional foods like green tea, grapes, oats, soybean, sunflower seeds or pumpkin seeds on CVD</p>	15
UNIT IV	<p>Functional foods and cancer Functional Food Components in Cancer Disease, Effect of functional foods like cruciferous vegetables, green tea, garlic, walnuts, berries on cancer.</p> <p>Functional foods and renal diseases</p>	15

	Epidemiology of kidney disease, functional foods for kidney diseases, Effect of functional foods like garlic, buckwheat on kidney.	
UNIT V	<p>Functional foods and obesity Functional foods and obesity, biomarkers of obesity, bioactive compounds in functional foods to manage healthy weight. Effect of functional foods like dietary fibers, psyllium husk, apple on obesity.</p> <p>Functional foods and diabetes Epidemiology of Diabetes, Functional Foods for Type 2 diabetes, effect of functional foods like turmeric, garlic, green tea, dietary fiber on diabetes.</p>	15
	Total	75

Activity

- Prepare a list of functional foods and its benefits.
- Make a Powerpoint presentation of Biomarkers for obesity, CVD, cancer, diabetes, kidney failure.
- Group discussion on bioactive compounds and its functions that are beneficial for chronic diseases.

COURSE OUTCOMES

After successful completion of the course the student will be able to:

CO1. Define functional foods and recall the components of functional foods and their health Benefits.

CO2. List out different functional foods, properties and their functions.

CO3. Explain the impact of functional foods in the prevention and management of CVD and kidney diseases.

CO4. Evaluate the role of functional foods in the prevention and management of cancer.

CO5. Summarize the role of functional foods in the prevention and management of obesity and type 2 diabetes mellitus.

REFERENCE:

1. Cho S.S. and Dreher, M.L. (2001): Handbook Dietary Fibre, Marcel Dekker Inc., New York.
2. Gibson, G.R. and C.M. Willams (2000), "Functional Foods: Concept to Product". Wood head.
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e- LEARNINGRESOURCES

- <https://youtu.be/uFf0zxQ3rBU>
- <http://epgp.inflibnet.ac.in/Home/Download>

MappingwithProgrammeOutcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	M	M	M	L	M	M	S
CO2	S	S	S	M	M	M	L	M	M	S
CO3	S	S	S	M	M	M	L	M	M	S
CO4	S	S	S	M	M	M	L	M	M	S
CO5	S	S	S	M	M	M	L	M	M	S

MappingwithProgrammeSpecificOutcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	3	3	3	3
CO5	3	3	3	3	3
Weightage	15	15	15	15	15
Weightedpercentage(roundedof)of CourseContributionto Pos	3	3	3	3	3

Title of the Course		FOUNDATIONS OF ENTREPRENEURSHIP								
Category	Year	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem							CIA	External	Total
Elective Course EC8	VI	Y				3	5	25	75	100

Learning Objectives
To enable the student to:
Understand the meaning and importance of entrepreneurship.
Gain awareness about existing entrepreneurial development programmes.
Know the government financial schemes available for entrepreneurship.

UNIT	CONTENT	HOURS
UNIT I	Entrepreneurship- Introduction, Concept of Entrepreneur, Entrepreneurship and Enterprise, Definition of Entrepreneurship, Objectives of Entrepreneurship Development, Phases of Entrepreneurship Development, Role of Entrepreneurship, Characteristics of Entrepreneurship, Traits of Entrepreneurship.	15
	Activity: Understanding the application process of financial services in Government sectors/MSME.	5
UNIT II	Entrepreneur- Meaning, Functions of Entrepreneur, types of entrepreneurs, stages of entrepreneurial process, role of entrepreneur in economic development.	8
	Activity: Categorize the stages of entrepreneurial process.	2
UNIT III	Women entrepreneurship - Concept, functions, growth, problems, functions, development. Rural entrepreneurship – meaning – need – problems – how to develop rural entrepreneurs – Role of NGOs and SHGs in rural entrepreneurship.	8
	Activity: List out the self-help group activities.	2
UNIT IV	Government Development Schemes - Prime minister employment generation programme (PMEGP), standup India, Pradhan Mantri Mudra Yojana (PMMY), Prime Minister Rural Development Fellows Scheme, Entrepreneurship and skill development programmes (ESDP) and state development schemes.	8
	Activity: Preparing/Submission of Project Proposal for Start Up/Business models	2
UNIT V	Institutions providing financial assistance - Loan schemes offered by SIDBI, SIDC's, SIIC's, NSIC and NABARD - Difficulties in procuring Institutional finance Agencies for Urban and Rural Development – Government, District Rural Developmental Agencies (DRDA).	20
	Activity: Visit to SSI Units. Availing Seed fund from SIDBI/Angel Investors.	5
	Total	75

COURSE OUTCOME

After successful completion of the course, the student will be able to: CO1: De

scribing the concept of entrepreneurship.

CO2: Analyze the types of entrepreneurs and understand their roles

CO3: Identify the financial institutions and apply for loan schemes for starting a business

CO4: Assess the problems of women and rural entrepreneurs.

CO5: Prepare a proposal for entrepreneurship utilizing government financial schemes

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- <http://www.simplynotes.in/e-notes/mbabba/entrepreneurship-development/>
- https://www.iare.ac.in/sites/default/files/lecture_notes/IARE_Entrepreneurial_Development_NOTES.pdf
- <https://www.yourarticlelibrary.com/women/women-entrepreneurship/women-entrepreneurship/99813>
- https://ccsuniversity.ac.in/bridge-library/pdf/DHA-MHA-403_Unit3.pdf
- <https://www.creditmantri.com/article-top-10-government-schemes-to-support-startups-promote-the-spirit-of-entrepreneurship/>

Mapping with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	S	S	S	S	L	S	M	S	S
CO2	S	L	S	S	M	L	M	S	S	L
CO3	S	S	M	S	S	L	S	L	M	M
CO4	S	S	S	S	M	M	S	S	S	S
CO5	S	S	S	S	M	L	S	M	M	S

Mapping with Programme Specific Outcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3
CO2	3	3	3	2	3
CO3	2	3	3	3	3
CO4	3	3	2	3	3
CO5	3	2	3	3	3
Weightage	14	14	14	14	15
Weighted percentage (rounded off) of Course Contribution to Pos	3	3	3	3	3

Title of the Course		APTITUDE AND REASONING SKILL FOR COMPETITIVE EXAMINATIONS									
Category	Year	III	L	T	P	O	Credits	Inst Hrs	Marks		
	Sem	VI							CIA	External	Total
Professional Competency Skill	VI		Y	Y			2	2	25	75	100

Learning Objectives
To enable the students to:
To acquaint the students in quantitative aptitude and logical reasoning required for various competitive examinations.
Gain knowledge and recognize the importance of aptitude and reasoning skill to excel in campus interviews.

UNIT	CONTENT	HOURS
UNIT I	Quantitative Ability (Basic Mathematics) Number Systems, LCM and HCF, Simplification, Square Roots and Cube Roots, Average, Problems on Ages, Percentages, Problems on Numbers.	5
UNIT II	Quantitative Ability (Advanced Mathematics) Probability, Profit and Loss, Simple and Compound Interest, Time, Speed and Distance, Time & Work, Ratio and Proportion.	5
UNIT III	Data Interpretation Tables, Column Graphs, Bar Graphs, Line Charts, Pie Chart, Venn Diagrams	5
UNIT IV	Verbal and Non-Verbal Reasoning Analogy, Blood Relation, Directional Sense, Number and Letter Series, Coding – Decoding, Calendars, Clocks, Venn Diagrams, Mathematical Operations, logical sequence of work, Mirror-image, Water-image, Completion of incomplete pattern, Grouping of identical figures	10
UNIT V	Logical Reasoning Statement–Argument, Statement Assumptions, Statement–Course of action, Statement and Conclusions, Cause and Effect reasoning, Deriving conclusion from passages, Theme detection.	5
	Total	30

COURSE OUTCOMES

After successful completion of the course the student will be able

- to: **CO1.** Understand the basic concepts of quantitative aptitude.
- CO2.** Gain in depth knowledge on various concepts of logical reasoning skills.
- CO3.** Excel and be able to solve aptitude and reasoning papers in campus interview.
- CO4.** Acquire satisfactory competency in use of reasoning.
- CO5.** Compete efficiently in national and international level competitive exams.

REFERENCES

1. Aggarwal, R. S. (2000). *A Modern Approach to Verbal & Non Verbal Reasoning*. S.Chand.
2. Sijwali, B. Sand
Indu Sijwali (2014). *Analytical and Logical Reasoning*, Arihant Publications.
3. Guha A, (2020) *Quantitative Aptitude by Competitive Examinations*, 7th Edition, McGraw Hill Education Publication.
4. Rajgotra, A. & Pradhan P (2020). *Wileys Exam Xpert A simpler Approach to Logical Reasoning*, Willey Publications

E-LEARNING RESOURCES

1. <https://prepinsta.com/>
2. <https://www.indiabix.com/>
3. <https://www.javatpoint.com>

Mapping with Programme Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	M	S	S	S	M	S	L	M	S	S
CO2	M	S	S	S	M	S	L	M	S	S
CO3	M	S	S	S	M	S	L	M	S	S
CO4	M	S	S	S	M	S	L	M	S	S
CO5	M	S	S	S	M	S	L	M	S	S

Mapping with Programme Specific Outcomes

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	3	3	3	3
CO2	2	3	3	3	3
CO3	2	3	3	3	3
CO4	2	3	3	3	3
CO5	2	3	3	3	3
Weightage	10	15	15	15	15
Weighted percentage (rounded off) of Course Contribution to Pos	2	3	3	3	3