BENGALURU CITY UNIVERSITY

CHOICE BASED CREDIT SYSTEM

(Semester Scheme with Multiple Entry and Exit Options for Under Graduate Course)

Syllabus for Home Science
(I & II Semester)

2021-22 onwards

Proceedings of the BOS in Home Science (UG & PG) for Bengaluru City University held on 30th September, 2021

A meeting of the BOS in Home Science (UG & PG) for Bengaluru City University held on 30th September, 2021 between 10:30 am to 5:00 pm in Smt. V.H.D Central Institute of Home Science, Seshadri Road, Bengaluru – 560 001.

The following members were present for the meeting:

Name and Designation

1. **Dr Usha Devi. C**
   Chairperson BOS in Home Science (UG, PG & PhD)
   Bengaluru City University (BCU)
   HOD, Dept. of Food and Nutrition & Research Centre,
   Smt. V.H.D Central Institute of Home Science,
   Seshadri Road, Bengaluru – 560 001.

2. **Dr. Vijayalaxmi A.H.M.,**
   Member
   Principal & Associate Professor,
   Department of Human Development and Research Centre,
   Smt. V.H.D Central Institute of Home Science,
   Seshadri Road, Bengaluru – 560 001

3. **Dr. Madhumathy S.,**
   Member
   HOD & Associate Professor,
   Department of Early Childhood Education and Administration,
   Smt. V.H.D Central Institute of Home Science,
   Seshadri Road, Bengaluru – 560 001

4. **Dr. Asha Jyothi U. H.,**
   Member
   HOD & Associate Professor,
   Department of Resource Management,
   Smt. V.H.D Central Institute of Home Science,
   Seshadri Road, Bengaluru – 560 001

5. **Dr. Grace Premila Victor.,**
   Member
   Associate Professor,
   Bishop Cotton Women's College,
   Field Marshal Kariyappa Road,
   Bengaluru – 560 025

Name and Designation

6. **Dr. Marie Kavitha Jayakaran.,**
   Member
   Associate Professor,
   Bishop Cotton Women's College,
   Field Marshal Kariyappa Road,
   Bengaluru – 560 025

7. **Dr. Shantha Maria B. V.,**
   Member
   Associate Professor,
   Home Science,
   Mount Carmel College , Autonomous,
   No. 58, Palace Road,
   Bengaluru – 560 052

8. **Dr. Sangeeta Pandey.,**
   Member
   Associate Professor,
   Nutrition and Dietetics,
   Mount Carmel College, Autonomous,
   No. 58, Palace Road,
   Bengaluru – 560 052

Members Absent

1. **Dr. Komala M**
   Member
   Professor,
   Department of Human Development,
   University of Mysore,
   Manasa Gangothri, Mysuru – 570 006

The meeting began with Dr Usha Devi C., Chairperson BOS in Home Science, welcoming the members to the meeting and appraising the members of the agenda scheduled for the meeting. She also informed the members that at present three colleges listed below are offering BA/BSc Home Science as one optional and BSc NDCZ courses at UG level and PG in Nutrition and Dietetics in one college.

a) Bishop Cotton Women's Christian College – BA/BSc Home Science as one optional and NDCZ course; and PG in Nutrition and Dietetics
b) Faith British Academy - BSc NDCZ course
c) S B A N M College, Yelahanka - BSc CND

1. The Board reviewed the NEP syllabus and made the necessary minor changes in the matrix and blown up syllabus of first and second semester and approved the same for the academic year 2021-2022 for all the courses.

2. Approval of the Ph.D Research guide ship of Dr Sujata Gupta, Department of Human Development, Mount Carmel College, Autonomous, Benguluru.
3. The Board included panel of examiners from Smt. V H D Central Institute of Home Science to the Panel of Examiners sent by Bengaluru City University and recommended the same to BCU (Annexure-I) and an additional list of panel from other colleges.
4. The Board also constitutes the BOE (UG/PG) for approval by the BCU (Annexure-II).

The meeting ended with the Chairperson thanking the members for attending the meeting.

30/09/2021

Dr. Vijayalaxmi A.H.M. Dr. Madhumathy S. Dr. Asha Jyothi U. H.

Dr. Grace Premila Victor. Dr. Marie Kavitha Jayakaran Dr. Shantha Maria B. V.

Dr. Sangeeta Pandey.

Dr. Usha Devi C,
Chairperson

Dr. USHA DEVI C, M.Sc., Ph.D.
Chairperson
BOS in Home Science (UG&PG)
Bangalore City University (BCU)
Central College Campus, Bangalore

BENGALURU CITY UNIVERSITY

CURRICULUM FRAMEWORK FOR FOUR-YEAR
UNDER GRADUATE PROGRAM (HONOURS)
AND MASTERS

[FIRST TWO SEMESTERS]

IN

HOME SCIENCE

2021

CONTENTS

Structure of B.A/ B.Sc Home Science as one

Discipline Major

(Model II A)

PREAMBLE

Home Science is both science and social science-art related multi-disciplinary field of study. The Learning Outcomes-based Curriculum Framework (LOCF) for B.Sc/B.A (Home Science) degree programme has been designed to integrate the application of sciences and humanities to create a cadre of home scientists to improve the quality of life of individuals, family, community and nation. Home science program is predominantly practical oriented and therefore helps to develop and polish various skills to empower the cadre required towards innovation, incubation and entrepreneurship along with professional and employable skills. Hands on experience with Project work/internship/fieldwork would help and build capacities for conducting primary research among the students. The curriculum has been structured to prepare the undergraduates to achieve skills to move forward with the development of the society/community/nation and entrepreneurship. The Curriculum incorporates multidimensional fundamental, core and applied aspects of various disciplines with Graduate Attributes (GAs) such as disciplinary knowledge, laboratory/field driven practical's, the art of writing & communication, self-learning, critical thinking, analytical & problem solving abilities, use of ICT, application of knowledge, lifelong learning, research-related skills, team spirit, multicultural competencies, leadership qualities, global vision, professional commitment and sensitizing with Sustainable Development Goals (SDGs) of United Nations. It also aims to build future ready professionals who would be socially responsible global citizens contributing to the overall development of the country. The model curriculum presented has a multidisciplinary approach keeping the New National Education Policy 2020

Model Curriculum

Name of the Degree Program: BA/B.Sc. Honours

Discipline Core:HomeScienceTotal Credits for the Program: 176

Starting year of implementation:2021-22

Program Outcomes:

By the end of the program the students will be able to:

(Refer to literature on outcome-based education (OBE) for details on Program Outcomes)

1. Deliver quality tertiary education through learning whiledoing.
2. Reflect universal and domain-specific values in HomeScience.
3. Involve, communicate, and engage keystakeholders.
4. Preach and practice change as acontinuum.
5. Develop the ability to address the complexities and interface among of self, societal and nationalpriorities.
6. Generate multi-skilled leaders with a holistic perspective that cuts across disciplines.
7. Instill both generic and subject-specific skills to succeed in the employment market.
8. Foster a genre of responsible students with a passion for lifelong learning andentrepreneurship.
9. Develop sensitivity, resourcefulness and competence to render service to families, communities, and the nation atlarge.
10. Promote research, innovation and design (product) development favoring all the disciplines in HomeScience.
11. Enhance digital literacy and apply them to engage in real time problem solving and ideation related to all fields of HomeScience.
12. Appreciate and benefit from the symbiotic relationship among the five core disciplines of Home Science – Resource Management, Food Science and Nutrition, Textiles and Clothing, Human Development and Family Studies and Extension andCommunication

Assessment:

Weightage for assessments (in percentage)

Type of Course	Formative Assessment / IA	Summative Assessment
Theory	60	40
Practical	25	25
Projects	-	-
Experiential Learning (Internships etc.)	-	-

Contents of Courses for Ba/B.Sc. Home Science as Major Subject

Model II A

Semester	Course No.	Course Category	Theory/Practical	Credits	Paper Title	Marks	
						S.A	I.A
1.	HSCT1.1	DSC A 1	Theory	4	Principles of Food and Nutrition	60	40
	HSCP1.1		Practical	2	Principles of Food and Nutrition	25	25
	HSCT1.2	OE- 1	Theory	3	Food Preservation	60	40
2.	HSCT2.1	DSC A2	Theory	4	Fundamentals of Human Development	60	40
	HSCP2.1		Practical	2	Fundamentals of Human Development	25	25
	HSCT2.2	OE- 2	Theory	3	Teaching Materials For Early Childhood Education	60	40
Exit Option with Certificate in Home Science (48 Credits)							
3.	HSCT3.1	DSC A 3	Theory	4	Early Childhood Care and Education	60	40
	HSCP3.1		Practical	2	Early Childhood Care and Education	25	25
	HSCT3.2	OE- 3	Theory	3	Income Generating Skills	60	40
4.	HSCT4.1	DSC A 4	Theory	4	Introduction to Textiles	60	40
	HSCP4.1		Practical	2	Introduction to Textiles	25	25
	HSCT4.2	OE- 4	Theory	3	FashionDesigning	60	40
Exit Option with Diploma in Home Science (96 Credits)							
5	HSCT5.1	DSC A 5	Theory	3	Resource Management and Consumer Economics	60	40
	HSCP5.1		Practical	2	Resource Management and Consumer Economics	25	25
	HSCT5.2	DSC A 6	Theory	3	Communication and Extension Education	60	40

	HSCP5.2		Practical	2	Communication and Extension Education	25	25
	HSCT5.3	VOC- 1	Theory	3	Special Education	60	40
6	HSCT6.1	DSC A 7	Theory	3	Human Development and Family Dynamics	60	40
	HSCP6.1		Practical	2	Human Development and Family Dynamics	25	25
	HSCT6.2		Theory	3	Interior Decoration	60	40
	HSCP6.2		Practical	2	Interior Decoration	25	25
	HSCT6.3		Theory	3	Designing Interior Spaces	60	40
Exit Option with Bachelor of Science Degree in Home Science (136 Credits)							
7.	HSCT7.1	DSC A 9	Theory	3	Traditional Textiles and Costumes of India	60	40
	HSCP7.1		Practical	2	Traditional Textiles and Costumes of India	25	25
	HSCT7.2	DSC A10	Theory	3	Children with Developmental Challenges	60	40
	HSCP7.2		Practical	2	Children with Developmental Challenges	25	25
	HSCT7.3	DSC A 11	Theory	3	Nutritional Management in Health and Disease	60	40
	HSCP7.3		Practical	2	Nutritional Management in Health and Disease	25	25
	HSCT7.4	DSE 1	Theory	3	Ergonomics in Design	60	40
	HSCT7.5	DSE 2	Theory	3	Public Health Nutrition	60	40
	HSCT7.6		Theory	3	Research Methodology	60	40
	HSCT8.1	DSC A12	Theory	3	Clothing and Fashion Illustration	60	40
	HSCP8.1		Practical	2	Clothing and Fashion Illustration	25	25
	HSCT8.2	DSC A 13	Theory	3	Entrepreneurship Development	60	40

8.	HSCP8.2		Practical	2	Entrepreneurship Development	25	25
	HSCT8.3	DSC A 14	Theory	3	Guidance and Counselling	60	40
	HSCP8.3		Practical	2	Guidance and Counselling	25	25
	HSCT8.4	DSE 3	Theory	3	Food Service Management	60	40
	HSCT8.5		Theory	6	Research Project OR Any two of the following electives / Internship (A) Food Preservationand Safety (B) EnergyConservation (C) ExtensionManagement (D) Gerontology	60	40
Award of Bachelor of Science Degree Honours Degree in Home Science (176credits)							

*In lieu of the research Project, two additional elective papers/ Internship may be offered.

Curriculum Structure for the Undergraduate Degree Program Ba/B.Sc.

Home Science

Total Credits for the Program: 176 Credits

Starting year of implementation: 2021-22

Name of the Degree Program: BA/BSc Degree/Honors

Discipline/Subject: Home Science as one Discipline A

Program Articulation Matrix:

This matrix lists only the core courses. Core courses are essential to earn the degree in that discipline/subject. They include courses such as theory, laboratory, project, internships etc. Elective courses may be listed separately.

Sem.	Title /Name of the course	Program outcomes that the course addresses (not more than 3 per course)	Pre-requisite course(s)	Pedagogy	Assessment
1	DSC A 1 Principles of Food and Nutrition	PO –4 PO -5 PO –7	12+/Equivalent Pass	• Demonstration • lecture	Formative and Summative Assessment
	OE- 1 Food Preservation	PO-3 PO-8 PO-9	12+/Equivalent Pass	• Demonstration • lecture	Formative and Summative Assessment
2	DSCA2 Fundamentals of Human Development	PO –4 PO –6 PO –8	12+/Equivalent Pass	• Lecture • FieldVisit	Formative and Summative Assessment
	OE-2 TeachingMaterials for Early Childhood Education	PO-1 PO-3 PO-8	12+/Equivalent Pass	• Demonstration • lecture	Formative and Summative Assessment

B.SC. HOME SCIENCE
SEMESTER 1

Course Title: **PRINCIPLES OF FOOD AND NUTRITION (DSC A1)**	
Total Contact Hours: 60Hrs	Course Credits: 4
Formative Assessment Marks: 40 marks	Duration of ESA / Exam: 3 Hrs
Model Syllabus Authors:	Summative Assessment Marks: 60 marks

Course Pre-requisite(s): Standard 12 and its equivalence with minimum 35%

Course Outcomes: (COs)

At the end of the course the student should be able to:

1. Understand the role and functions of nutrients, their requirements and the effect of deficiency andexcess.
2. Understand the concept of an adequate diet and the importance of meal planning for all age group

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes(POs)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Understand the role and functions of nutrients, their requirements and the effect of deficiency and excess	**x**		**x**						**x**			
Understand the concept of an adequate diet and the importance of meal planning for all age group			**x**	**x**							**x**	

B.SC. HOME SCIENCE
SEMESTER 1

Title of the Course: PRINCIPLES OF FOOD AND NUTRITION

Course : DSC A1	
Number of Theory Credits	**Number of lecturehours/semester**
4	**60**

CONTENT	**60 Hrs.**
Unit–1 Introduction toNutrition	**12 Hrs**
Chapter No. 1: Definition of nutrition, Malnutrition and Health, Functions of food, Food groups -Types of foodpyramids	**6 Hrs**
Chapter No. 2: Balanced diet - Meal planning – steps in meal planning	**6 Hrs**
Unit – 2Nutrients	**18 Hrs**
Chapter No. 3: Nutrients Macro and Micro nutrients- classification, Sources, functions and deficiency. A) Carbohydrates, B) Proteins C) Fats D) Minerals – Calcium, Iron, Iodine. E) Vitamins – Fat soluble vitamins – A, D, E & K Water soluble vitamins – vitamin C Thiamine, Riboflavin, Niacin	**15 Hrs**
Chapter No. 4: A) Water – Functions, sources and water balance B) Fibre – Functions and sources, C) Energy – factors affecting BMR	**3 Hrs**
Unit – 3 Methods of Cooking	**15 Hrs**
Chapter No. 5. Methods of cooking- Advantages and disadvantages a) Water – Boiling, steaming, pressure cooking b) Oil/Fat – Shallow frying,	

deep frying c) Air – Baking **Chapter No. 6.** Nutrition through lifecycle Nutritional requirement, dietary guidelines: Adulthood, Pregnancy, Lactation, Infancy -Complementary feeding, Pre-school, Adolescence, Old age.	**4 hrs** **11hrs**
Unit – 4 Food Preservation	**15 Hrs**
Chapter No. 7 - Food Preservation- Objectives and principles-Methods: dehydration, temperature regulation ,using preservatives like salt and sugar	**8 hrs**
Chapter No. 8 - Food Handling and storage - freezing thermal and non-thermal methods, Canning	**7hrs**
Unit – 4 Food Preservation	**15 Hrs**
Chapter No. 7 - Food Preservation- Objectives and principles-Methods: dehydration, temperature regulation ,using preservatives like salt and sugar	**8 hrs**
Chapter No. 8 - Food Handling and storage - freezing thermal and non-thermal methods, Canning	**7hrs**

Formative Assessment = 100 marks	
Assessment Occasion / type	**Weightage in Marks**
Test 1	15
Test 2	15
Assignment + Project	5 + 5
Total	**60 marks + 40 marks = 100 marks**

Practical Course:2Credits **30Hrs**

List of Experiments to be conducted

Unit 1: a) Weights and Measures

b) Food pyramids

Unit 2: Methods of cooking

a) Boiling, steaming
b) Pressure cooking, shallow and deep fatFrying
c) Dry heat -baking

Unit 3: Identification of nutrient rich foods and preparation of any three nutrient rich foods

Unit 4: Food preservation – salt, sugar and dehydration.

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2. Srilakshmi B, (2002), Nutrition Science. New Age International publishers. NewDelhi
3. Swaminathan M. (2002), Advanced text book on food and Nutrition. Volume I.Bappco.
4. Gopalan.C.,RamaSastry B.V., and S.C.Balasubramanian (2009), Nutritive value of Indian Foods.NIN.ICMR.Hyderabad.
5. Mudambi S R and Rajagopal M V, (2008), Fundamentals of Foods, Nutrition & diet therapy by New Age International Publishers, NewDelhi

Date **CourseCoordinator** **Subject CommitteeChairperson**

Ba/ B.Sc. HOME SCIENCE

SEMESTER 1

Course Title: **FOOD PRESERVATION (OE1)**	
Total Contact Hours: 45 Hrs	Course Credits: 3
Formative Assessment Marks: 40 marks	Duration of ESA/Exam: 3 hrs
Model Syllabus Authors:	Summative Assessment Marks: 60 marks

Course Pre-requisite(s): Standard 12 and its equivalence with minimum 35%

Course Outcomes (COs):

At the end of the course the student should be able to:

1. Know the principles of preservation behind the methods ofpreservation
2. Understand the stages of sugar cookery, quality of pectin and acidity in the development of preserved foodproducts
3. Acquire skills to formulate food basedproducts
4. Explore the principles of preservation in fruits and vegetables basedproducts
5. Skills to prepare cereals and pulse based preserved products and develop new products with retention of qualitycourse

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs)	1	2	3	4	5	6	7	8	9	10	11	12
Know the principles of preservation behind the methods of preservation			x		x							
Understand the stages of sugar cookery, quality of pectin and acidity in the developmentof preserved food products				x	x							
Acquire skills to formulate food basedproducts							x	x				

Explore the principles of preservation in fruits and vegetables based products							x		x			
Skills to prepare cereals and pulse based preserved products and develop new products with retention of qualitycourse					x		x					

Ba/ B.Sc. HOME SCIENCE
SEMESTER 1

Title of the Course: FOOD PRESERVATION

Course: OE 1	
Number of Theory Credits	**Number of lecturehours/semester**
3	**45**

CONTENT	**45 Hrs**
Unit-I Concept of Food Preservation	**10 Hrs**
Chapter No.1- Importance of Food Preservation, Types of Food spoilage by Microorganisms and by Enzymes, Basic Principles of Food Preservation Food preservatives- Use of Salt, Acid, Sugar, natural food preservatives and artificialpreservatives	**5 Hrs**
Chapter No. 2- Starting a food preserving unit, Product Promotion strategies and marketing skills	**5 Hrs**
Unit-II Preparation of dehydrated products	**20 Hrs**
Chapter No.3 Methods of drying & dehydration , different types of driers , freeze drying- lyophilization , packing & storage	**5 Hrs**
Chapter No. 4- Drying methods for the selected products -Rice, Sago, Wheat, Maida, Rice flakes, black gram dhal, green gram dhal, Horse gram dhal Roots and Tubers. Preparation of salted, dehydrated, preserves (Traditional Indian varieties of chips, Papads, Khakharas etc and Masala Powders, onion, garlic, ginger	**7 Hrs**

powder etc) **Chapter No. 5-** Hands on experience :Drying of vegetables- peas, potato, carrot, French beans, Reconstitution of dried vegetables, Drying & preparation of powders- garlic, ginger, spices mix etc	**8 Hrs**
Unit -III Preservation by Using Sugar, Chemicals, Salts and Fermentation	**15 Hrs**
Chapter No. 7 - Role of Pectin in Preserved foods, Stages in Sugar Cookery, Sugar Concentrates – Principles of Gel Formation. Hands on Experience: Preparation of Jam, Jelly, Marmalades, Sauce and Squash, Preserves, Candied, Glazed, Crystallized Fruits, Toffee, Evaluation of pH, Acidity and pectin quality, Preparation and Preservation of Fruit Juices,RTS	**8 Hrs**
Visit to Fruits and Vegetable processing industry **Chapter No. 8 -** Pickling – Principles Involved and Types of Pickles, Chemical Preservatives – Definition, Role of Preservation, Permitted Preservatives, FSSAI guidelines, Foods fermented by Yeasts and Bacteria, Wine and Cheese Making	**3 Hrs** **4 Hrs**
Chapter No. 9 - Hands on experience: Pickle making, Visit to Commercial Pickle Manufacturing/ Food Industry / Wine industry	

Formative Assessment = 100 marks	
Assessment Occasion / type	**Weightage in Marks**
Test 1	15
Test 2	15
Assignment + Project	5 + 5
3 Total	**60 marks + 40 marks = 100 marks**

Reference:

1. Maney S (2008). Foods, Facts and Principles, 3 rd Edition Published by Wiley Eastern, New Delhi. Usha Chandrasekhar (2002) Food Science and Application in Indian Cookery, Phoenix Publishing House P. Ltd., NewDelhi.
2. Raina U, Kashyap S, Narula V, Thomas S Suvira, VirS, Chopra S (2010) Basic Food Preparation: A Complete Manual, 4th Edition, Orient Black Swan Ltd,Mumbai
3. Srivastava R.P. (2012),Fruit and vegetable preservation – Principles and Practices, International Book Distributing Co., (IBDC), NewDelhi.
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5. Shafiur, Rahman, M. (2007), Handbook of Food Preservation, 2 nd edition, CRC press, NewDelhi

Date **CourseCoordinator** **Subject CommitteeChairperson**

Ba/B. Sc. HOME SCIENCE
SEMESTER 2

Course Title: **Fundamentals of Human Development (DSC A2)**	
Total Contact Hours: 60 Hrs.	Course Credits: 4
Formative Assessment Marks: 40 marks	Duration of ESA / Exam: 3 hrs.
Model Syllabus Authors:	Summative Assessment Marks: 60 marks

Course Pre-requisite(s): Standard 12 and its equivalence with minimum 35% Course Outcomes (COs):

At the end of the course the student should be able to:

1. Explain the need and the importance of studying human growth and development across lifespan.
2. Identify the biological and environmental factors affecting humandevelopment.
3. Describe the characteristics, needs and developmental tasks of different stages in the human lifecycle
4. Discuss the special features characteristic of each stage and its impact on the next stage
5. Explain the broad theoretical perspectives of differentresearchers.

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Explain the need for and importance of studying human growth and development across life span.		X		X	X						X	

Identify the biological and environmental factors affecting humandevelopment.								X	X		X	
Describe the characteristics, needs and developmental tasks of different stages in the human life cycle								X		X		X
Discuss the special features characteristic of each stage and its impact on the next stage			X	X								
Explain the broad theoretical perspectives of different researchers.			X	X					X			

Ba/B.Sc. HOME SCEINCE
SEMESTER 2

Title of the Course: FUNDAMENTALS OF HUMAN DEVELOPMENT

Course : DSC A2	
Number of Theory Credits	**Number of lecturehours/semester**
4	**60**

CONTENT	**60 Hrs**
Unit – 1 Introduction	**20 Hrs**
Chapter No. 1 Human Development – Definition, needs, and Scope; Domains of Development:	**3 Hrs**
Chapter No. 2 Concept and principles of Growth and development; Factors influencing growth and development.	**5 Hrs**
ChapterNo. 3 Methods of studying Human development, Prenatal development	**3 Hrs**
Chapter No. 4 Fertilization, Pregnancy–Signs, Symptoms, Complications, Discomforts; Stages of Prenatal Development	**5 Hrs**
Chapter No. 5 Child Birth - Process and types, Birth complications	**4 Hrs**
Unit – 2 Infancy and Early childhood Years	**20 Hrs**
Chapter No. 6. Infancy - Definition, Significance, Developmental Tasks, and developmental milestones; Physical growth, reflexes and perceptual	

abilities, Immunization Schedule; **Chapter No. 7.** Early Childhood Years- Definition, Developmental tasks; physical, motor, intellectual, language, emotional, social developmental milestones. importance of preschool education and Significance of play for all-round development **Chapter No. 8.** Piaget's cognitive Theory and Erik Erickson's Personality Theory.	**8 Hrs** **4 Hrs**
Unit – 3 Middle Childhood Years	**20 Hrs**
Chapter No. 9 The Middle Childhood Years - Definition, Developmental tasks. Highlights of Physical, Social, Emotional, Intellectual development. Significance of school and functions; Importance of extra-curricular activities, Peers - Importance and Influence, Interestdevelopment **Chapter No. 10** Role of Parents and Disciplinary Techniques; Role of siblings, peers and others in the development; Behaviorproblems	**12 Hrs** **8 Hrs**

Formative Assessment = 100 marks	
Assessment Occasion / type	**Weightage in Marks**
Test 1	15
Test 2	15
Assignment + Project	5 + 5
3 Total	**60 marks + 40 marks = 100 marks**

Practical:2Credits **60Hrs**

List of Experiments to be conducted

1. Prepare an album on the stages of prenataldevelopment.
2. Organize a lecture/workshop for parents on importance of the nutrition/ Needs of preschoolchildren.
3. Develop an activity to foster cognitive development in schoolchildren

FormativeAssessment	
Assessment Occasion/ type	**Weightage in Marks**
Test 1	15
Test 2	15
Assignment /Project	5+5
Total	60 marks + 40 marks = 100 marks

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1. Berk, L.E. (2005). Child development (5th ed.). New Delhi: PrenticeHall.
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Date **CourseCo-ordinator** **Subject CommitteeChairperson**

Ba/B.Sc. HOME SCIENCE

SEMESTER 2

Course Title: TEACHING MATERIALS FOR EARLY CHILDHOOD EDUCATION (OE 2)	
Total Contact Hours: 45 Hrs	**Course Credits: 3**
Formative Assessment Marks: 60marks	**Duration of ESA/Exam: 3 Hrs**
Model Syllabus Authors:	**Summative Assessment Marks: 40marks**

Course Pre-requisite(s): Standard 12 and its equivalence with minimum 35%

Course Outcomes (COs):

At the end of the course the student should be able to:

1. Understand the importance of teaching learningmaterials.
2. Understand the different teaching methods & materials for earlyyears
3. Understand the different teaching methods & materials developmentally challengedchildren

Course Articulation Matrix: Mapping of Course Outcomes (COs) with Program Outcomes (POs 1-12)

Course Outcomes (COs) / Program Outcomes (POs)	1	2	3	4	5	6	7	8	9	10	11	12
Understand the importance of teaching learningmaterials		X		x			x					
Understand the different teaching methods & materials for early years			x				x		x			
Understand the different teaching methods & materials developmentally challenged children			x				x		x			

B.Sc. HOME SCIENCE
SEMESTER 2

Title of the Course: TEACHING MATERIALS FOR EARLY CHILDHOOD EDUCATION

Course: OE 2	
Number of Theory Credits	**Number of lecturehours/semester**
3	**45**

CONTENT	**45 Hrs**
Chapter No. 1- Objectives of Teaching-Learning Materials, Orientation on different methods and materials used for teaching young children and studying the techniques of different methods. • The oral communication methods: (stories, songs, Music, description, explanation, etc.) and conversational methods (conversation, heuristic conversation, questioning on a special subject,etc.). • Exploratory learning methods: direct exploration of objects and phenomena (systematic and independent observation, small experiments, etc.) and indirect exploration (demonstration through pictures, films,etc.). • Methods based on the pupils' direct voluntary action (exercises, practical work, etc.) and simulated action (didactic games, learning through drama,etc.). • Use of natural materials (plants, shells, seeds, insects, rocks, sand, etc.) • Intuitive materials (cast and clay models, Puppets, blocks, puzzles, mazes, etc) • Figurative aids (pictures, photographs, atlas books, maps, albums, table games,etc.)	**15 Hrs**

• Printedteachingaids(children'sbooks,workbooks,etc.).Printed teaching aids Digital material (audio &videos)	
Unit-II – Development of Materials for Early years	**13 Hrs**
Chapter No. 2- Design and development of developmentally appropriate play materials to foster all round development in children using indigenous materials, Developing stories, songs with music and rhythm appropriate for infancy through earlychildhood	**8 Hrs**
Chapter No. 3 - Creative Activities - importance, Types and values promoted, method of giving instructions. Process of scripting for puppet plays and creative drama. a) Painting – free hand, finger, thread, wax resist&spray b) Printing -block, leaf, stencil,thumb c) Pasting – collage, paper mosaic,sand d) Miscellaneous-etching, marbling, dough modelling	**5 Hrs**
Unit –III- Development of Materials for developmentally challenged children	**12 Hrs**
Chapter No. 4- Creating teaching learning materials for developmentally challenged children (Blind, Dumb & deaf, Learning disabilities, Speech disorders, Mentally retarded, Gifted children, Slow learners)	**8 Hrs**
Chapter No. 5 - Designing & developing digital play materials like videos, audio aids or audio- Visual aids	**4 Hrs**

Formative Assessment = 100 marks	
Assessment Occasion / type	**Weightage in Marks**
Test 1	15
Test 2	15
Assignment + Project	5 + 5
3 Total	**60 marks + 40 marks = 100 marks**

Reference:

1. Contractor,M., 1984, Creative drama and puppetry in education, National book trust of India,Delhi
2. Devadas P. Rajammal and N. Jaya (1996), "A Textbook on child development", Mac Millan India Ltd. NewDelhi.
3. Nasim Siddiqi, Suman Bhatia and Suptika Biswas (2007) Early Childhood Care and Education –Book IV, DOABA HOUSE, NewDelhi.
4. Sen Gupta, M. (2009). Early Childhood Care and Education. New Delhi: PHI Learning Pvt.Ltd.
5. Soni,R., 2015,Theme based early childhood care and education programme- A Resource Book,NCERT

Date CourseCo-ordinator Subject CommitteeChairperson

Structure of
B.Sc. (Hons.) with

Nutrition and Dietetics as a

Major / Minor Subject & M.Sc.

Nutrition and Dietetics

(Model II A)

Preamble

The subject wise expert committee to draft model curriculum contents in Nutrition & Dietetics constituted by the Department of Higher Education, Government of Karnataka, Bangalore vide GO No. ED 260 UNE 2019 (PART-1) DATED 13.08.2021 is pleased to submit its partial report on the syllabus for the First Year (First & Second Semesters) B.Sc.(Basic/Honors) Nutrition and Dietetics and detailed Course Structure for B.Sc.(Honors) Nutrition and Dietetics and M.Sc.(OneYear) Nutrition andDietetics.

The committee discussed various models suggested by the Karnataka State Higher Education Council in its joint meetings with the Chairpersons of Board of Studies of all state universities in Karnataka and resolved to adopt Model IIA (Model Program Structure for the Bachelor of Arts (Basic/Hons.)/ Bachelor of Science (Basic/Hons.) for the subjects with practical with Nutrition and Dietetics as Major/Minor.

The B.Sc (Honors) programme in Nutrition and Dietetics intends to create competent professionals with in-depth understanding of various aspects offered under this programme. The programme offers a broad range of courses spanning across areas of community nutrition, food science, dietetics, and nutrition counseling. The four-year programme aims at conceptual understanding of the key elements of nutrition and dietetics. Students would be trained in areas such as nutritional assessment, diet planning, food product development, health communication, clinical nutrition, nutrition education and behavior modification. The programme would also introduce students to research methodology and statistics which would be pivotal indeveloping

reasoning, logic, problem solving and scientific temper. The students would be further exposed to continuous hands-on training through regular practical and internship experience. This would enable creative and critical thinking among the students. The comprehensive programme would enable students to keep themselves updated through internship, practical and projects.

The subject expert committee designed the Course Learning Outcome (CO) to help the learners to understand the main objectives of studying the courses by keeping in mind of the Programme outcomes (PO) of the graduate degree with honors in Nutrition and Dietetics or a graduate degree with Nutrition and Dietetics as a major subject.

As the field of Nutrition and Dietetics is vast, dynamic and an evolving area of specialization. This requires students to learn and be abreast with recent advances and evidence- based guidelines in the field of food and nutrition. Hence the subject expert committee suggests introduction of elective papers (for both Discipline electives and Open Electives) along with Discipline Core Courses. The BoS in Nutrition and Dietetics of universities may include additional electives based on the expertise of their staff and needs of the students. Student can select elective paper as per her/his needs and interest. The skills and attributes acquired during the programme would open doors to job opportunities in areas of food science, nutrition, health promotion, and disease management, also paves way for research and higher education for interested students.

Model Curriculum

Name of the Degree Program: M.Sc. Discipline

Core: Food Science and Nutrition Total Credits for

the Program: 265

Starting year of implementation: 2021-22

Program Outcomes:

By the end of the program the students will be able to:

PO 1	**Disciplinary Knowledge**: Understand the role and importance of food and nutrition for the welfare of the community and acquire the skills in planning diet, health and diseases
PO 2	**Communication Skills:** Learn and apply evidence-based guidelines in the field of dietetics, nutrition counselling, nutrition research laboratory, community
PO 3	**Critical thinking:** Understand the structure and functions of the different organs systems in relation to nutrition
PO 4	**Interpersonal and Problem Solving**: Design solutions and novel food products to meet the specified nutrient needs with appropriate consideration for the public health and safety.
PO 5	**Critical thinking, Communication and problem solving**: Comprehend, communicate effectively, plan, design and implement programs in the field of nutrition anddietetics
PO 6	**Decision making, Analytical and Research skills:** Understand and demonstrate the knowledge of food science, food science and quality control in societal and environmental contexts

PO 7	**Moralandethicalawareness/reasoningandResearchskills:**Apply ethical principles and commit to professional ethics and responsibilitiesin
	the field of nutrition, sports, food industry and health care sectors.
PO 8	**Interpersonal and Business skills:** Understand the applications of nutraceuticals and functional foods in the product development from conceptualization to evaluation of the quality of the food product
PO 9	**Analytical and Research skills:** Comprehend the knowledge and role of food additives in food industry in relation to its analytical techniques
PO 10	**Critical thinking, Analysis and Research skills:** Understand and apply the concept of nutrients and nutritional science in the evaluation of health and disease
PO 11	**Goal Setting and Problem-solving skills**: Enable students to pursue higher education and research

Assessment:

Weightage for assessments (in percentage)

Type of Course	Formative Assessment / IA	Summative Assessment
Theory	**40**	**60**
Practical	**25**	**25**
Projects	**40**	**60**
Experiential Learning (Internships etc.)	**80**	**20**

Content of Courses for B.Sc. Degree/Honours in Nutrition and Dietetics

Model II A

Semester	Course Code.	Category of course	Theory/ Practical	Credits	Paper Titles	Marks	
						S.A	I.A
I	NDT1.1	DSC	Theory	4	Fundamentals of nutrition	60	40
	NDP1.1	DSC	Practical	2	Fundamentals of nutrition	25	25
	NDT1.2	OE	Theory	3	Fundamentals of food and health / Healthy lifestyle andnutrition	60	40
II	NDT2.1	DSC	Theory	4	Principles of Food Science and Preservation	60	40
	NDP2.1	DSC	Practical	2	Principles of Food Science and Preservation	25	25
	NDT2.2	OE	Theory	3	Food safety and Hygiene/ Food Adulteration	60	40
Exit Option with Certificate in Nutrition and Dietetics (52 Credits)							
III	NDT3.1	DSC	Theory	4	Nutrition through life span	60	40
	NDP3.1	DSC	Practical	2	Nutrition through life span	25	25
	NDT3.2	OE	Theory	3	Nutritional Assessment/ Traditional Foods and Health	60	40
IV	NDT4.1	DSC	Theory	4	Human Physiology	60	40
	NDP4.1	DSC	Practical	2	Human Physiology	25	25
	NDT4.2	OE	Theory	3	Nutrition in weight management/ Diet in life style disorder	60	40
Exit Option with Diploma in Nutrition and Dietetics (100 Credits)							
V	NDT5.1	DSC	Theory	3	Clinical Nutrition &Dietetics –1	60	40
	NDP5.1	DSC	Practical	2	Clinical Nutrition &Dietetics –1	25	25

	NDT5.2	DSC	Theory	3	Intermediary metabolism	60	40
	NDP5.2	DSC	Practical	2	Intermediary metabolism	25	25
	NDT5.3	VOC	Theory	2	Food Product Development & Sensory analysis	60	40
	NDP5.3	VOC	Practical	1	Food Service Management	25	25
	NDT5.4	Minor	Theory	3	Nutrition Psychology and Diet Adherence	60	40
	NDP5.4	Minor	Practical	2	Nutrition Psychology and Diet Adherence	25	25
VI	NDT6.1	DSC	Theory	3	Clinical Nutrition &Dietetics –II	60	40
	NDP6.1	DSC	Practical	2	Clinical Nutrition &Dietetics –II	25	25
	NDT6.2	DSC	Theory	3	Community Nutrition &Public Health	60	40
	NDP6.2	DSC	Practical	2	Community Nutrition &Public Health	25	25
	NDP6.3	VOC	Practical	3	Food Analysis	25	25
	NDT6.4			2	Internship	25	25
	NDT6.5	Minor	Theory	3	Assessment of Nutritional Status	60	40
	NDP6.5	Minor	Practical	2	Assessment of Nutritional Status	25	25
Exit Option with Bachelor in Science Degree in Nutrition and Dietetics (144 Credits)							
	NDP5.3	VOC	Practical	1	Food Service Management	25	25
	NDT5.4	Minor	Theory	3	Nutrition Psychology and Diet Adherence	60	40
	NDP5.4	Minor	Practical	2	Nutrition Psychology and Diet Adherence	25	25

VI	NDT6.1	DSC	Theory	3	Clinical Nutrition &Dietetics –II	60	40
	NDP6.1	DSC	Practical	2	Clinical Nutrition &Dietetics –II	25	25
	NDT6.2	DSC	Theory	3	Community Nutrition &Public Health	60	40
	NDP6.2	DSC	Practical	2	Community Nutrition &Public Health	25	25
	NDP6.3	VOC	Practical	3	Food Analysis	25	25
	NDT6.4			2	Internship	25	25
	NDT6.5	Minor	Theory	3	Assessment of Nutritional Status	60	40
	NDP6.5	Minor	Practical	2	Assessment of Nutritional Status	25	25
Exit Option with Bachelor in Science Degree in Nutrition and Dietetics (144 Credits)							
VII	NDT7.1	DSC	Theory	3	Advanced Nutrition –I	60	40
	NDP7.1	DSC	Practical	2	Advanced Nutrition –I	25	25
	NDT7.2	DSC	Theory	3	Advanced Food Science	60	40
	NDP7.2	DSC	Practical	2	Advanced Food Science	25	25
	NDT7.3	DSC	Theory	3	Food Microbiology, Sanitation & Hygiene	60	40
	NDT7.4	DSE	Theory	3	Statistics for Nutrition Research / food and Drug interaction	60	40
	NDT7.5	DSE	Theory	3	Food Processing & Preservation / Functional food quality	60	40
	NDT7.6	DSE	Theory	3	Research Methodology	60	40
VIII	NDT8.1	DSC	Theory	3	Advances in Medical NutritionTherapy	70	40
	NDP8.1	DSC	Practical	2	Advances in Medical NutritionTherapy	25	25

	NDT8.2	DSC	Theory	3	Advanced Nutrition-II	60	40
	NDT8.3	DSC	Theory	3	Exercise physiology and nutrition	60	40
	NDT8.4	DSE	Theory	3	Nutrition counselling / Nutrition careprocess	60	40
	NDT8.5		Research Project/	6	Research Project	140	60
Exit Option with Bachelor in Science Honours in Nutrition and Dietetics (185 Credits)							
IX	NDT9.1	DSC	Theory	3	Nutraceuticals and FunctionalFoods	60	40
	NDP9.1	DSC	Practical	2	Nutraceuticals and FunctionalFoods	25	25
	NDT9.2	DSC	Theory	3	Nutrition in critical care	60	40
	NDP9.2	DSC	Practical	2	Nutrition in critical care	25	25
	NDT9.3	DSC	Theory	3	Food safety & quality assurance	60	40
	NDT9.4	DSE	Theory	3	Nutrition in emergencies / Food sanitation & hygiene	60	40
	NDT9.5	VOC	Theory	3	Maternal & child nutrition / Precision nutrition and Nutrigenomics	60	40
	NDT9.6	DSE	Theory	3	Food Additives/ Nutritional Biochemistry	60	40
X	NDT10.1	DSC	Theory	3	Sports Nutrition	60	40
	NDT10.1	DSC	Practical	2	Sports Nutrition	25	25
	NDT10.2	DSC	Theory	3	Program Planning and Nutrition	60	40
	NDT10.3	DSC	Theory	3	Nutrition Education in Community	60	40
	NDT10.4	DSE	Theory	3	Geriatric Nutrition / PediatricNutrition	60	40
	NDT10.5		Dissertation	6	Dissertation/ Research project	140	60

Award with Master in Science in Nutrition and Dietetics (265 Credits)

*In lieu of the research Project, two additional elective papers/ Internship may be offered

Abbreviation ND – Nutrition and Dietetics; DSC – Discipline Core; DSE –Discipline Specific Elective; T – Theory/ P – Practical; VOC-Vocational; OE- Open Elective; E-Elective ; MIN -minor

CURRICULUM STRUCTURE FOR UNDERGRADUATE DEGREE PROGRAM

Name of the Degree Program: B.Sc. (Honors)

Discipline / Subject: Nutrition and Dietetics

Starting Year of Implementation: 2021-22

PROGRAM ARTICULATION MATRIX

Semester	Course No	Program outcomes that the course addresses	Pre Requisite Course (s)	Pedagogy	Assessment
I	DSC 1 Fundamentals of nutrition	PO1 PO2	PUC/12th Science students	➢ MOOC ➢ Seminar ➢ Assignments ➢ Group ➢ Discussion ➢ Case Studies ➢ Lecture ➢ ICT ➢ Content Review ➢ Audio -VideoMaterials ➢ Demonstration ➢ Field Visits ➢ Hands OnTraining ➢ Observation ➢ On The FieldTraining ➢ Review ➢ Research ➢ Article ➢ Presentations ➢ Nutrition Education Tools And Module Development	Formative and Summative Assessment
	OE 1 Fundamentals of food and health / Health lifestyle and nutrition	PO1 PO2	PUC/12th Science students		Formative and Summative Assessment
II	DSC- 2 Principles of Food Science and Preservation	PO1 PO4 PO6	PUC/12th Science students		Formative and Summative Assessment
	OE- 1 Food safety and Hygiene/ Food Adulteration	PO1 PO4 PO6	PUC/12th Science students		Formative and Summative Assessment

Syllabus for B.Sc. with Nutrition and Dietetics as Major Subject & B.Sc. (Hons) Nutrition and Dietetics

B.Sc NUTRITION AND DIETETICS SEMESTER 1

Title of the Course: FUNDAMENTALS OF NUTRITION

Course Title: Fundamentals of Nutrition (DSC 1)	
Total Contact Hours: 45 Hours	Course Credits:3
Formative Assessment Marks: 40	Duration of ESA/Exam: 3 hours
Model Syllabus Authors:	Summative Assessment Marks: 60

Course Pre-requisite(s): PUC Science students

Course Outcomes (COs):

1. Gain knowledge in basic terminology, aspects of nutrition & functions of food in healthy lifesustenance
2. Understand function of nutrients, dietary sources, consequences of deficiency andexcess
3. Understand the food composition and concept of energybalance
4. Equip with knowledge and understanding on importance ofwater

Course Articulation Matrix:

Course Outcomes (COs) / Program Outcomes(POs)	1	2	3	4	5	6	7	8	9	10	11	12
Gain knowledge in basic terminology, aspects of nutrition & functions of food in healthy life sustenance	X											
Understand function of nutrients, dietary sources, consequences of deficiency and excess	X									x		
Understand the food composition and concept of energy balance	X											

Equip with knowledge and understanding on importance of water	**X**											

B.Sc NUTRITION AND DIETETICS SEMESTER 1

Title of the Course: FUNDAMENTALS OF NUTRITION

Course: DSC- 1	
Number of Theory Credits	**Number of lectureHours/semester**
3	**45**

Content	**45 Hrs**
Unit – 1 Introduction to Nutrition	**14 hours**
Understanding concept of nutrition, nutrients, nutritional status, malnutrition Functions of food, food groups, concept of balanced diet Methods of cooking and preservation of Nutrients Water: Functions, sources and water balance	
Unit - 2 Macronutrients	**14 hours**
Classification, Sources, Functions and Deficiency of Carbohydrates, Dietary Fibre Proteins and fats	
Unit - 3 Energy Metabolism	**14 hours**
Significance, components, factors influencing body composition, energy metabolism, BMR Measurement methods – Direct and Indirect Energy expenditure in activities, the use of doubly labeled water Influence of energy excess & deficit on body composition – obesity and under nutrition. Current methodology, Recommendations	

Unit – 4 Micro Nutrients - Sources, Functions and Deficiency	14 hours
Minerals: Calcium, Phosphorous, Iron, Iodine, Zinc Fat soluble vitamins (Vitamin A, D, E, K) Water soluble vitamins (B complex vitamins: Thiamine, Riboflavin, Niacin, Folic acid and Vitamin C)	

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
CIA	15+ 15
Presentation / Assignment	10
Total	30

Practical:2Credits **60Hrs**

List of Experiments to be conducted

1. Weights andmeasures
2. Methods ofcooking

a. Water – boiling, steaming, pressurecooking
b. Oil- Shallow frying, deepfrying

3. Identification of nutrient richfood
4. Planning and preparation of macro nutrient rich recipesclasses

a. Energy b.Protein

5. Planning and preparation of micro nutrientrecipes

a. Iron b. VitaminA

REFERENCES

1. Raheena Begum., (2009), AText book of Food, Nutrition & Dietetics, Sterling Publications, NewDelhi.
2. Mudambi S R and Rajagopal M V., (2008), Fundamentals of Food, Nutrition and Diet Therapy by New Age International Publishers, NewDelhi
3. Srilakshmi. B., (2009), Human Nutrition, New Age InternationalPublishers

Date **CourseCo-ordinator** **Subject CommitteeChairperson**

B.Sc NUTRITION AND DIETETICS SEMESTER 1

Title of the Course: FUNDAMENTALS OF FOOD & HEALTH -OE

Course Title: FUNDAMENTALS OF FOOD AND HEALTH (OE-1)	
Total Contact Hours: 45	Course Credits: 3
Formative Assessment Marks: 40	Duration of ESA/Exam: 3 hours
Model Syllabus Authors:	Summative Assessment Marks: 60

Course Outcomes (COs):

1. Gain knowledge on key nutrients and their implications onhealth
2. Familiarize with the concept of health and issues of public healthconcern
3. Understand the effect of novel and processed foods on general health and wellbeing

Course Articulation Matrix:

Course Outcomes (COs) / Program Outcomes(POs)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Gain knowledge on key nutrients and their implications on health	X											
Understand the effect of novel and processed foods on general health and well being	X											

B.Sc NUTRITION AND DIETETICS SEMESTER 1

Title of the Course: FUNDAMENTALS OF FOOD & HEALTH

Course: OE-1	
Number of Theory Credits	**Number of lectureHours/semester**
3	**45**

Content	**45 Hours**
Unit–1 Overview of Food &Macronutrients	**12 hours**
Overview of Food & Nutrients, Food choice and factors influencing food choice Classification of nutrients – macronutrients and micronutrients. Energy, Carbohydrates, Protein and Fats Classification, Functions and Sources Impact of macronutrients on health – Deficiency and Excess	
Unit - 2 Micronutrients & Water	**11 hours**
Micronutrients - Classification, Functions and Sources Impact of micronutrients on health – Deficiency and Excess Water – Role, Body fluids and electrolytes	
Unit – 3 Components of health	**11 hours**

Health – Definition, Components, Factors influencing health, Dietary guidelines Issues of public concern Malnutrition, Anemia, Vitamin A deficiency, Obesity, Diabetes and Hypertension	

Unit - 4 Foods for health and well being	**11 hours**
Functional foods – Probiotics, prebiotics and phytochemicals Health supplements, processed foods, organic foods Nutrition label – understanding and importance	
Unit - 4 Foods for health and well being	**11 hours**
Functional foods – Probiotics, prebiotics and phytochemicals Health supplements, processed foods, organic foods Nutrition label – understanding and importance	

Formative Assessment = 100 marks	
Assessment Occasion / type	**Weightage in Marks**
Test 1	15
Test 2	15
Assignment + Project	5 + 5
Total	**60 marks + 40 marks = 100 marks**

References

1. Antia F.P., Philip Abraham, Clinical Dietetics and Nutrition, Oxford University Press; 4thedition.
2. Kathleen Mahan L., Sylnia Escott-Stump, Krause's food, nutrition and diet therapy (11th edition). Saunders company,London.
3. Passmore R. and Davidson S. (1986) Human nutrition and Dietetics. Liming stone publishers.
4. Robinson C.H. Careme, Chenometh W.L., Garmick A.E. (1986) 16th edition Normal Therapeutic nutrient. Publish by Mc Millan Company NewYork.
5. Shil's M.E., Alfon J.A., Shike M (1994), Modern nutrition inhealthand diseases eighthedition.
6. William S.R., Nutrition and Diet Therapy fourth edition C.V. MosCompany.

Date **CourseCo-ordinator** **Subject CommitteeChairperson**

B.Sc. NUTRITION AND DIETETICS SEMESTER 2

Title of the Course: PRINCIPLES OF FOOD SCIENCE & PRESERVATION

Course Title: **Principles of Food Science & Preservation (DSC- 2)**	
Total Contact Hours: 45	Course Credits: 3
Formative Assessment Marks:40	Duration of ESA/Exam: 3 hrs
Model Syllabus Authors:	Summative Assessment Marks: 60

Course Pre-requisite(s): 12 std / PUC SCIENCE

Course Outcomes (COs):

1. Apply basic nutrition knowledge in making foods choices and obtaining an adequatediet
2. Learn to distinguish and relate the characteristics and properties offoods
3. Apply the knowledge gained on characteristics and properties of foods during cooking
4. Develop appropriate food preparation and processing methods to ensurequality standards

Course Articulation Matrix:

Course Outcomes (COs) / Program Outcomes(POs)	1	2	3	4	5	6	7	8	9	10	11	12
Learn to distinguish and relate the characteristics and properties of foods	X					X						
Apply the knowledge gained on characteristics and properties of foods during cooking.				X								
Develop appropriate food preparation and processing methods to ensure quality standards				X		X						

B.Sc NUTRITION AND DIETETICS SEMESTER 2

Title of the Course: Principles of Food Science & Preservation

Course: DSC- 2	
Number of Theory Credits	**Number of lectureHours/semester**
3	**45**

CONTENT	**56 Hours**
Unit – 1	**14 hours**
Introduction to Food Science Properties of food (a) Colloids, sols, gels, foam- (b) Emulsion formation- (c) Bound and free water -(d) pH Value, osmosis and osmotic pressure- (e) Boiling, melting and freezing points Sensory Evaluation- Subjective andobjective. Cereals & Millets-Production, importance &composition- Cereal Products. Wheat, rice maize, ragi and sorghum. Malting and cooking of cereals, non-enzymatic reactions, Leaving agents. Fermented products, Milling of wheat, Parboiling ofRice, Pulses- composition, toxic constituents and cooking of pulses, variety and processing	

Unit – 2	14 hours
Fruits and vegetables – Production composition, pigments, flavors and variety- changes during cooking-enzymatic browning, non-enzymatic browning. Milk and milk products- composition, storage- Processing of milk- Coagulation- Milk products available in India. Egg- structure, composition, storage, grade, quality, selection, Role of egg in food preparation, coagulation.	16hrs
Unit – 3	**14 hours**
Sugar, Jaggery and honey - Composition, different forms of sugar, storage- Behaviors of syrups at different temperatures- Crystallization and caramelization Oil and Fats- Composition, types, storage, plasticity, Hydrogenation and processing .Changes during heating- Fats as shortening agents, smoking point, Rancidity, specific fat (Lard, Butter,Margarine) Meat, Fish poultry-structure, composition, storage, Post mortem changes in meat, Curing of meat, Tenderization, Aging of meat, selection, Meat cookery.	
Unit – 4	**14 hours**
Methods of cooking, nutrient loss during cooking Concepts of food safety and standards Food Preservation, food spoilage, method of preservation by low temperature, high temperature, dehydration, food irradiation	

Formative Assessment = 100 marks	
Assessment Occasion / type	**Weightage in Marks**
Test 1	15
Test 2	15
Assignment + Project	5 + 5
Total	**60 marks + 40 marks = 100 marks**

Practical:2Credits **60Hrs**

List of Experiments to be conducted

1. Weights & measures, standardization of common foodpreparation.
2. Sensoryevaluation
3. Starch cookery I-microscopic observation of different starches gel formationand gelatinization.
4. Starch cookery II- Rice and Wheat preparation, factors influencingdoughdevelopment and gluten formation.Leavened products, milk cookery-casein formation, curdsetting.
5. Fermented products and pulsecookery.
6. Vegetable cookery- Effect on pigments and enzymatic browning in fruits and vegetables
7. Egg cookery and fat and oil cookery.
8. Sugar and Jaggery- Syrup formation, crystallization andcaramelization.

9. Leavened products, milk cookery-casein formation, curdsetting.
10. Fermented products and pulsecookery.
11. Vegetable cookery- Effect on pigments and enzymatic browning in fruits and vegetables
12. Egg cookery and fat and oil cookery.
13. Sugar and Jaggery- Syrup formation, crystallization andcaramelization.

Formative Assessment	
Assessment Occasion/ type	**Weightage in Marks**
CIA	15+15
Presentation / Assignment	10
Total	40

References

1. Arora K., Gupta K.V.,Theory ofcooking
2. Bennen Marion. Introductoryfoods
3. Lavies. (1998) Food commodities. Heinemann Ltd,London
4. Lowe Bella Experimentalcookery
5. Norman N Potter, Joseph H Hotchkiss (1999) Food scienceTechnology
6. Peckham. Foundation of foodpreparation
7. Srilakshmi. Food Science. New Age International Publishers, NewDelhi.

Sari Edelstein, 2014, Food Science-An ecological approach, Jones & Bartlett Learning,MA

Date **CourseCo-ordinator** **Subject CommitteeChairperson**

B.Sc NUTRITION AND DIETETICS SEMESTER 2

Course Title: **FOOD SAFETY AND HYGIENE (OE- 2)**	
Total Contact Hours: 45	Course Credits: 3
Formative Assessment Marks: 40	Duration of ESA/Exam: 3 hours
Model Syllabus Authors:	Summative Assessment Marks: 60

Course Outcomes (COs):

1. Gain knowledge on food safety and their implications onhealth
2. Familiarize with the concept of food safety issues on publichealth
3. Understand the standards, laws and regulations regarding foodsafety

Course Articulation Matrix:

Course Outcomes (COs) / Program Outcomes (POs)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Gain knowledge on food safety and their implications on health	X											
Familiarize with the concept of food safety issues on public health	X					X						
Understand the standards, laws and regulations regarding food safety						X						

B.Sc NUTRITION AND DIETETICS SEMESTER 2

Title of the Course: FUNDAMENTALS OF FOOD SAFETY AND HYGIENE (OE-2)

Number of Theory Credits	Number of lecture hours/semester
3	45

Content	45 Hours
Unit–1 Introduction to FoodSafety	**11hours**
Concept and meaning of Food Safety, food adulteration, food hazards Food laws and regulations – National (FSSAI) and international (FAO) food laws, Governingbodies Exposure, estimation, toxicological requirements and risk analysis Safety aspects of water and beverages Safety assessment of food contaminants and pesticide residues	
Unit – 2 Food Safety: Principles of prevention	**11 hours**
Reduce microbial contamination and control growth Eliminate source of contaminants Sanitation: principle and purposes	
Unit – 3 Food Protection	**11 hours**

Food protection by: Thermal transfer methods, Chemical methods, Biocontrol methods and biotechnology, Irradiation methods Foodborne Illness Risk Factors Food worker Education and training	
Unit - 4 Food Hygiene	**12 hours**
Food hygiene law and the importance of food safety. Food Safety Hazards. Temperature control, food deliveries, refrigeration, low and high-risk foods,	

use by dates and best before dates, and stock rotation (FIFO). Cross-Contamination Hand hygiene, further hygiene considerations, protective clothing, reporting illness and first aid.	
use by dates and best before dates, and stock rotation (FIFO). Cross-Contamination Hand hygiene, further hygiene considerations, protective clothing, reporting illness and first aid.	

Formative Assessment = 100 marks	
Assessment Occasion / type	**Weightage in Marks**
Test 1	15
Test 2	15
Assignment + Project	5 + 5
Total	**60 marks + 40 marks = 100 marks**

References

1. Food Safety-Theory and Practice:Paul L. Knechtges, Jones & BartlettLearning,2012
2. Food Hygiene and Sanitation With case studies, Sunetra Roday, 2nd Edition, Tata McGraw Hill Education PvtLtd.,2011
3. Kirk, R.S and Sawyer , R.: Pearson's composition and analysis of foods, Longman Scientific and technical. 9th Edition, England.1991
4. Bryan,F.L: Hazardous Analysis Critical Control Point Evaluation. A guide to identifying Hazards and assessing risks associated with food preparation and storage. WHO,Geneva.1992
5. Bureau of Indian Standards: Specifications and Standardmethods.

Date **CourseCo-ordinator** **Subject CommitteeChairperson**