National Education Policy-2020

Common Minimum Syllabus for Uttarakhand State Universities and Colleges

Syllabus Bachelor of Science (Home Science) / Master of Science Home Science (Food and Nutrition/Textil and Apparel Designing)

DEPARTMENT OF HOME SCIENCE

SURAJMAL AGARWAL PRIVATE KANYA MAHAVIDYALAYA

Kichha, Udham Singh Nagar Uttarakhand (Affiliated to Kamaun University, Nainital, Uttarakhand

EXPERT COMMITTEE

S.NO.	NAME	DESIGNATION	DEPARTMENT	AFFILIATION
1.	Prof. Lata Pandey	Convener and Head	Department of Home Science D.S.B Campus	Kumaun University, Nainital
2.	Dr. Chhavi Arya	Expert, Associate Professor	Department of Home Science, D.S.B Campus	Kumaun University, Nainital
3.	Dr. Meena Batham	Expert, Associate Professor	Department of Fabric and Apparel Science, Institute of Home Economics, Delhi	Delhi University
4.	Dr. Mukta Singh	Expert, Head	Department of Home Science, M.M.V.	B.H.U., Uttar Pradesh
5.	Dr. Manisha Ghalot	Expert, Head	Deptt. of Apparel & Textile Science	GBPUA&T, Pantnagar
6..	Dr. Rekha Naithani	Expert, Head	Department of Home Science	BGR Campus, Pauri, C.U. Garhwal
7.	Dr. Sunita Rani	Expert, Head	Department of Home Science	Kumaun University, Nainital
8.	Mr. Satish Kandpal	Registrar	Gyanarthi College, Kashipur	Kumaun University, Nainital

SYLLABUS PREPARATION COMMITTEE

S. NO.	NAME	DESIGNATION	DEPARTMENT	AFFILIATION
1.	Dr. Sunita Rani	Head	Department of Home Science, SAPKM, Kichha	Kumaun University, Nainital
2.	Dr. Janki Joshi	Assistant Professor	Department of Home Science, SAPKM, Kichha	Kumaun University, Nainital
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5.	Dr. Jyoti Pant	Assistant Professor	Department of Home Science, SAPKM, Kichha	Kumaun University, Nainital
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Contents

FOOD AND NUTRITION

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Course Title- Research Methodology

Course Title- Elementary Human Physiology

Course Title - Food Safety and Quality Control

Course Title - Dissertation on Major or Minor/ Academic Project/ Entreprenuership

Semester VIII

Course Title- Recent Trends in Food Science and Nutrition

Course Title- Principles of Food Preservation

Course Title - Advanced Community Nutrition

Course Title - Practical based on Principles of Food Preservation and Advanced Community Nutrition

Course Title - Dissertation on Major or Minor/ Academic Project/ Entreprenuership

Master in Home Science (Food and Nutrition)

Semester-IX

Course Title- Clinical Nutrition and Dietetics

Course Title- Food Microbiology

Course Title- Practical on Clinical Nutrition and Dietetics Nutrition through life cycle

Course Title- Basics of Nutrition and Hygiene

Course Title- Dissertation on Major or Minor/ Academic Project/ Entreprenuership

Semester-X

Course Title- Nutrition through Life Cycle

Course Title- Food Quality Analysis

Course Title- Food Product Development and Marketing

Course Title- Practical based on Food Quality Analysis and Food Product Development and Marketing

Course Title- Dissertation on Major or Minor/ Academic Project/ Entreprenuership

Bachelor of Home Science (Honours with Research)(Food and Nutrition)						
FOURTH YEAR	**VII**	**DSC-19**	Food Service Management		Practical	4
		DSE-9	Research Methodology	***Home Science students can choose given three DSE courses Or Two DSE courses and GE course from other department Or One DSE with two GE courses from other department.***	Theory	4
		DSE-10	Elementary Human Physiology		Theory	4
		DSE-11	Food Safety and Quality Control		Theory	4
		GE-7	***Home science students will choose GE subject from other department***			
		Dissertation	Dissertation on Major or Minor/ Academic Project/ Entrepreneurship Practical		Practical	**6**
	VIII	**DSC-20**	Recent Trends in Food Science and Nutrition		Theory	4
		DSE-12	Principles of Food Preservation	***Home Science students can choose given three DSE courses Or Two DSE courses and GE course from other department Or One DSE with two GE courses from other department.***	Theory	4
		DSE-13	Advanced Community Nutrition		Theory	4
		DSE-14	Practical based on Principles of Food Preservation and Advanced Community Nutrition		Practical	4
		GE-8	***Home science students will choose GE subject from other department***			
		Dissertation	Dissertation on Major or Minor/ Academic Project/ Entreprenuership Practical		Practical	**6**
Students on exit shall be awarded Bachelor in Home Science (Honours with Research) after securing the requisite 176 credits on completing semester VIII						
Master in Home Science (Food and Nutrition)						

FIFTH YEAR	**IX**	**DSC-21**	Clinical Nutrition and Dietetics		Theory	4
		DSE-15	Food Microbiology	***Home Science students can choose three given DSE courses Or Two DSE courses and GE course from other department Or One DSE with two GE courses from other department.***	Theory	4
		DSE-16	Practical on Clinical Nutrition and Dietetics		Practical	4
		DSE-17	Basics of Nutrition and Hygiene		Theory	4
		GE-9	***Home science students will choose GE subject from other department***			
		Dissertation	Dissertation on Major or Minor/ Academic Project/ Entreprenuership		Practical	6
	X	**DSC-22**	Nutrition Through Life Cycle		Theory	4
		DSE-18	Food Quality Analysis	***Home Science students can choose given three DSE courses Or Two DSE courses and GE course from other department Or One DSE with two GE courses from other department.***	Theory	4
		DSE-19	Food Product Development and Marketing		Theory	4
		DSE-20	Practical based on Food Quality Analysis and Food Product Development and Marketing		Practical	4
		GE-10	***Home science students will choose GE subject from other department***			
		Dissertation	Dissertation on Major or Minor/ Academic Project/ Entreprenuership		Practical	6
Students on exit shall be awarded Master in Home Science (Food and Nutrition) after securing the requisite 220 credits on completing semester X						

Programme Specific Outcomes (PSOs) (Master's Degree) **After this programme, the learners will be able to:**	
PSO 1	The aim of journal club is to stimulate continuing intellectual curiosity in students to discover new ideas so that they can re-look at old ideas and develop insightful connections among ideas.
PSO 2	Furthermore, it encourages them to exchange ideas focused on a source, thereby providing a unique and intellectual experience to the students.
PSO 3	Understand the role of food and nutrition for the welfare of the community Excel in the area of personal and public health nutrition and apply skill based knowledge in food industry.
PSO 4	To make them easy how to preserve the food and learn to understand about the jam, jelly and pickle processing methods. Acquire entrepreneurial skills in the field of food science and nutrition, Excel as academicians and research personnel,
PSO 5	The students are able to understand about the food service management and setup their own canteen after studying this. Develop comprehensive and analytical skills in food industries.
PSO 6	Enable them to understand the laws of food safety and detect the adulteration in foods. Take up professions in community upliftment programmes. Gain insight in public health nutrition for employment in State and Central government.
PSO 7	The purpose of teaching research methodology is to acquaint students with research and statistical methods and imparting knowledge of Computer applications for data analysis
PSO 8	The primary aim of the programme is to train the students in the method of scientific inquire and independent research. This is accomplished through advanced coursework and active participation with the faculty in their research programmes.

FOOD AND NUTRITION

Semester-VII
Bachelor in Home Science (Honours with Research)
DISCIPLINE SPECIFIC COURSE (DSC-19) – Food Service Management
No. of Hours-120

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title	Credits	Credit distribution of the course			Eligibility Criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
DSC-19 Food Service Management	4	0	0	4	Passed class XII with science, Arts and commerce	Nil

Bachelor of Home Science (Honours with Research)

Programme: Bachelor of Home Science (Honours with Research)	**Year: Fourth**	**Semester:Seventh** **Paper: DSC-19**

Subject- Home Science

Course- DSC-19	**Course Title: Food Service Management**

Course Outcomes: The students at the completion of the course will be able to:

- To learn about the concept of management of Food Service System
- To enhance the students about different food service systems

Credits: 4	**Discipline Specific Course**
Max. Marks: As per Univ. rules	**Min. Passing Marks:** As per Univ. rules

Unit	Topics	No. of Hours
I	Standardization of recipes of snacks and meals for portion and cost.	20
II	Standardization of recipes of snacks and meals for children	15
III	Running a canteen for fifty persons.	40
IV	Planning, preparation and service for special occasions.	25
V	Visit to nearby food service institutions.	20

Suggested Readings: .

- Food Service Management: Howto Succeed in the High-risk Restaurant Business by Someone Who Did. By Bill Wentz. Atlantic Publishing Group.
- Restaurant Marketing for Owners and Managers**.** By Patti J. Shock. Wiley Restaurant Basics Series, publisher.
- The Non-Commercial Food Service Manager's Handbook: A Complete Guide for Hospitals, Nursing Homes, Military, Prisons, Schools and Churches**.** By Douglas R. Brown and Shri Henkel. Atlantic Publishing Group Inc.
- Managing Food and Nutrition Services for Culinary, Hospitality, and Nutrition

Professions. By Sari Edelstein, editor. Jones and Bartlett Learning, publisher.
Catering Management.Mohini Sethiand Surjeet Malhan. Revised second edition.New Age international Limited Publishers.

Suggested equivalent online courses: On Swayam, Vidyamitra.inflibnet.ac.in, literature-study-online.com, epg-pathshala, egyankosh.ac.in

Suggested Continuous Evaluation Methods: Seminar/ Presentation on any topic of the above syllabus· Test with multiple choice questions/ short and long answer questions· Attendance

Semester-VII
Bachelor in Home Science (Honours with Research)
DICIPLINE SPECIFIC ELECTIVE (DSE-9) - Research Methodology
No. of Hours-60

CREDIT DISTRIBUTION, ELIGIBILITYAND PRE-REQUISITES OF THE COURSE

Course Title	Credits	Credit distribution of the course			Eligibility Criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
DSE-9 Research Methodology	4	4	0	0	Passed class XII with science, Arts and commerce	Nil

Bachelor of Home Science (Honours with Research)		
Programme: Bachelor of Home Science (Honours with Research)	**Year: Fourth**	**Semester: Seventh** **Paper: DSE-9**
Subject- Home Science		
Course- DSE-9	**Course Title: Research Methodology**	
Course Outcomes: The students at the completion of the course will be able to: • To learn about the concept of training • To enhance the students about different training methods and their use		
Credits: 4	**Discipline Specific Elective**	
Max. Marks: As per Univ. rules	**Min. Passing Marks:** As per Univ. rules	

Unit	Topics	No. of hours
I	Research Methodology: An Introduction, Meaning of Research, Objectives of Research, Types of Research, Research Approaches, Significance of Research, Research Process.	12
II	Sampling Design: meaning and definition of sampling, Steps in Sampling Design, Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs, probability sampling and non-probability sampling. Hypotheses, types of hypothesis, variables and types of variables.	12

III	Methods and tools of data collection: Collection of Primary Data, Observation Method, Interview Method, Collection of Data through Questionnaires, Collection of Data through Schedules, Difference between Questionnaires and Schedules, Collection of Secondary Data,	12
IV	.Data processing methods, Graphical Representation of data, General guidelines for presenting data, tables, graphs and illustrations, Interpretation and generalization and analysis of data.	12
V	Scientific reporting, points to be considered in report writing, Footnotes, Bibliographic citation, Citation style, Preparation of an abstract	12

Suggested Readings:

- C. R. Kothari, GauravGarg, 2014 Research Methodology Method and Techniques, (IIIrdedition), New age International Publishers.
- C R. kothari research methodology methods and techniques Wiley eastern.limited
- Bandarker, P.L. and Wilknson T.S. 2000, Methodology and Techniques of Social Research, Himalaya Publishing House, Mumbai.
- Bhatnagar, GL. 1990: Research Methods and Measurements in Academy, New Delhi.
- Dooly, D, 1995, Strageies for interpreting Qualitative data: sage Publication California

Suggested equivalent online courses: On Swayam, Vidyamitra.inflibnet.ac.in, literature-study-online.com, epg-pathshala, egyankosh.ac.in

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Semester-VII
Bachelor in Home Science (Honours with Research)
DISCIPLINE SPECIFIC ELECTIVE (DSE-10) – Elementary Human Physiology
No. of Hours-60

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title	Credits	Credit distribution of the course			Eligibility Criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
DSE-10 Elementary Human Physiology	4	4	0	0	Passed class XII with science, Arts and commerce	Nil

Bachelor of Home Science (Honours with Research)		
Programme: Bachelor of Home Science (Honours with Research)	**Year: Fourth**	**Semester:Seventh** **Paper: DSE-10**
Subject- Home Science		
Course- DSE-10	**Course Title: Elementary Human Physiology**	

Course Outcomes: The students at the completion of the course will be able to:
- Understand the basic concepts of human physiology
- Understand the Functioning of major body systems
- Analyze role of nutrients in body functions

Credits: 4	**Discipline Specific Elective**
Max. Marks: As per Univ. rules	**Min. Passing Marks:** As per Univ. rules

Unit	Topics	No. of Hours
I	Physiological process, structural and functional basis of human body, skeletal system, joints and muscular system	10
II	Functions of brain and spinal cord. Nerve impulse reflex action and sense organs	5
III	Composition and functions of blood and lymph, heart and course of blood circulation, blood pressure, pulse and heart sounds	5
IV	Respiratory apparatus, mechanism of respiration, respiratory rates, volume and transport of gases	10
V	Physiology of Kidney and skin	10
VI	Physiology of digestion, digestive enzymes and their functions,	10

	functions of liver. Absorption from the intestine	
VII	• The location, secretion and functions of various endocrine glands • Male reproductive organs and their functions • Female reproductive organs and their functions • Pregnancy, parturition and milk secretion	10

Suggested Readings:

- Khurana, I. 2021. Textbook of Medical Physiologyb(3rd ed.). Elsevier India.
- Jain, A.K. 2019. Textbook of Physiology (7th ed.). Jaypee Brothers Medical Publishers.

Suggested equivalent online courses: On Swayam, Vidyamitra.inflibnet.ac.in, literature-study-online.com, epg-pathshala, egyankosh.ac.in

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Semester-VII
Bachelor of Home Science (Honours with Research)
DISCIPLINE SPECIFIC ELECTIVE (DSE-11) Food Safety and Quality Control

No. of Hours-60

CREDIT DISTRIBUTION, ELIGIBILITYAND PRE-REQUISITES OF THE COURSE

Course Title	Credits	Credit distribution ofthe course			Eligibility Criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
DSE- 11 Food Safety and Quality Control	4	4	0	0	Passed class XII with science, Arts and commerce	Nil

Bachelor of Home Science (Honours with Research)		
Programme: Bachelor of Home Science (Honours with Research)	**Year: Fourth**	**Semester: Seventh** **Paper: DSE-11**
Subject- Home Science		
Course- DSE-11	**Course Title: Food Safety and Quality Control**	

Course outcomes: The Student at the completion of the course will be able to:

- To familiarize students to applyprotocol for safe food handling techniques, water and waste management
- To understand the role of food packaging and the importance of Nutrition labeling.
- To analyse consequences of food poisoning and infection on the health of individuals
- To Understand the basic principles food preservation methods

Credits: 4	**Discipline Specific Elective**
Max. Marks: As per Univ. rules	**Min. Passing Marks:** As per Univ. rules

Unit	Topics	No. of Lectures
I	Qualitystandards, assurance and factors affecting quality.	10
II	Methods and techniques for assessment of food quality. 1. Objective evaluation: Physical parameters and their testing. 2. Sensory evaluation: Sensory characteristics of foods, conducting sensory tests, selection of taste panel, type of tests- difference, ranking, sensitivity and descriptive tests. 3. Nutritional evaluation: Proximate composition, iron, calcium phosphorus, vitamin C.	10
III	Food safety: Microbiological evaluation of raw material/products, microbiological limits, colony count, coliform streptococci and their indicators.	10
IV	Food adulteration: common adulterants and their ill effects.	5
V	Food standards, food laws and regulations: PFA, Essential Commodity Act, FPO, MPO, MMPO, Misbranding, BIS, Agmark, Export Quality Control and Inspection Act.	15

VI	Food safety, safetyhazards and risks, HACCP as a method to prevent food bore illness, ISO.	10

Suggested Readings:

- Mahindra N. S, 2008, Food Additives, Characteristics, Detection and Estimation, APH Publishing Corporation, New Delhi
- Ward law G.M, Hamp J S, 2007, Perspectives in Nutrition, 7th edition, Mc Graw Hill
- The Food Safety and Standards Act along with Rules and Regulations, 2011, Delhi, Commercial Law Publishers (India) Pvt Ltd.
- Khanna K et al, 2013, Text Book of Nutrition and Dietetics, Phoenix publications
- Sethi P and Lakra P, Aahaarvigyaan, Poshanevam suraksha, 2015, Elite Publishing House.

1. Sharma S, Wadhwa A, 2003, Nutrition in the Community- a text book, Elite publishing house.

Suggested equivalent online courses: On Swayam, Vidyamitra.inflibnet.ac.in, literature-study-online.com, epg-pathshala, egyankosh.ac.in

Suggested Continuous Evaluation Methods: Seminar/ Presentation on anytopic of the above syllabus Test with multiple choice questions/ short and long answer questions Attendance

Semester-VIII
Bachelor in Home Science (Honours with Research)
DICIPLINE SPECIFIC COURSE (DSC-20) – Recent Trends in Food Science and Nutrition

No. of Hours-60

CREDIT DISTRIBUTION, ELIGIBILITYAND PRE-REQUISITES OF THE COURSE

Course Title	Credits	Credit distribution of the course			Eligibility Criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
DSC-20 Recent Trends in Food Science and Nutrition	4	4	0	0	Passed class XII with science, Arts and commerce	Nil

Bachelor in Home Science (Honours with Research)		
Programme/Class: Bachelor in Home Science (Honours with Research)	Year: Fourth	Semester: Eighth Paper: DSC- 20
Subject: Home Science		
Course- DSC-20	Course Title: Recent Trends in Food Science and Nutrition	

Course outcomes: The Student at the completion of the course will be able to:

- To know the methods of research used in human and animal studies related to nutrition
- To know the recent concepts in Food Science

Credits: 4	Discipline Specific Course
Max. Marks: As per Univ. Rule	Min. Passing Marks: As per Univ. rules

Unit	Topics	No. of Hours
I	Methods of research used in human and animal studies related to nutrition. (cross sectional, longitudinal, retrospective, prospective, cohort and so on, available source of information to review the literature for research)	10
II	Nutrition and mental development	5
III	Nutrition and work performance including exercise and sports	5
IV	Nutrition for space and mines/under water	5
V	Nutrition and Infection	5
VI	Nutrition and phyto-chemicals	5

VII	Recent concepts in Human Nutrition: nutrigenomics, metabolomics, neutraceuticals, phytochemicals	10
VIII	Recent concepts in Food Science: genetically modified foods, functional foods, health foods and novel foods, organically grown foods, Emerging technologies in food processing, Application of nano-technology in food processing	10
IX	Newer packaging materials: edible gums and coatings, automation in food processing operation available India	5

Recommended Readings:

- Debasis Bagehi. Nutraceuticals and Functional Food Regulations if the United States and around the World. Academic Press.

Suggested equivalent online courses: On Swayam, Vidyamitra.inflibnet.ac.in, literature-study-online.com, epg-pathshala, egyankosh.ac.in

Suggested Continuous Evaluation Methods: Seminar/ Presentation on any topic of the above syllabus Test with multiple choice questions/ short and long answer questions Attendance

Semester-VIII

Bachelor of Home Science (Honours with Research)

DISCIPLINE SPECIFIC ELECTIVE (DSE-12)- Principles of Food Preservation

No. of Hours-60

CREDIT DISTRIBUTION, ELIGIBILITYAND PRE-REQUISITES OF THE COURSE

Course Title	Credits	Credit distribution of the course			Eligibility Criteria	Pre-requisite ofthe course (if any)
		Lecture	Tutorial	Practical/ Practice		
DSE-12 Principles of Food Preservation	4	4	0	0	Passed class XII with science, Arts and commerce	Nil

Bachelorof Home Science (Honours with Research)		
Programme: Bachelorof Home Science (Honours with Research)	Year: Fourth	Semester: Eighth Paper: DSE-12

Subject- Home Science	
Course- DSE-12	Course Title: Principles of Food Preservation

Course outcomes: The Student at the completion of the course will be able to:

- Describe different processing and food preservation techniques based on different food materials like low temperature processing, high temperature processing, irradiation, preservation by chemicals and high concentration.
- List different food processing techniques, various methods used to preserve foods and factors influencing the shelf-life of the food products.
- Identify different packaging techniques used for food packaging and also effects of different processing techniques on palatability and nutritive value of food.
- Write down the basic principles of different preservation methods.

Credits: 4	Discipline Specific Elective
Max. Marks: As per Univ. rules	Min. Passing Marks: As per Univ. rules

Unit	Topics	No. of hours
I	Food processing and preservation principles, method of preservation: • Pasteurization (definition, time-temperature combination and equipment) • Sterilization (definition, time-temperature combination and equipment) • Blanching (definition, time-temperature combination and equipment, adequacy in blanching), • Canning (definition, manufacturing process, defects of cans)	15

II	Freezing and Refrigeration: Introduction to refrigeration, cool storage; Freezing: introduction, principle of freezing, freezing methods- air freezing, plate freezing, liquid immersion freezing and cryogenic freezing, changes during freezing, advantages and disadvantages of freezing and changes in food during freezing storage; introduction to thawing, changes during thawing and its effect on food.	15
III	Food drying/ dehydration: definition, free and bound moisture, concept of water activity, factors affecting drying, moisture content (wet basis and dry basis), drying methods and equipment: sun/solar drying, cabinet dryer, tunnel dryer, spray dryer, freeze dryer, fluidized bed dryer; changes in food during drying	15
IV	Food irradiation- definition, units of radiation, mechanism of actions, uses of radiation processing in food industry, kinds of ionizing radiation used in food irradiation; food fermentation.	15

Suggested Readings:

- Fellows, P. Food Processing Technology Principles and Practices. CRC Press, Boca Raton Boston New York Washington, DC.
- Jongen, W. M. F. 2002. Fruit and Vegetable Processing: Improving quality, Woodhead Publishing Ltd, England
- Somogayi, L. P., Ramaswamy, H. S. and Hui, Y. H. 1996. Processing Fruits: Science and Technology, Vol 1. Biology, Principles and Applications. CRC Press, Florida
- Smith, D. S., Cash, J. N., Nip, Y. K. and Hui, Y. H. 1997. Processing vegetables: Science and Technology. Technomic Publishing Company Inc, USA.
- Dauthy, M. E. 1995. Fruit and Vegetable Processing. Food and Agriculture Organization of the United Nations, Rome.

Suggested equivalent online courses: On Swayam, Vidyamitra.inflibnet.ac.in, literature-study-online.com, epg-pathshala, egyankosh.ac.in

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Semester-VIII
Bachelor of Home Science (Honours with Research)
DISCIPLINE SPECIFIC ELECTIVE (DSE-13) Advanced Community Nutrition

No. of Hours-60

CREDIT DISTRIBUTION, ELIGIBILITYAND PRE-REQUISITES OF THE COURSE

Course Title	Credits	Credit distribution of the course			Eligibility Criteria	Pre-requisite ofthe course (if any)
		Lecture	Tutorial	Practical/ Practice		
DSE-13 Advanced Community Nutrition	4	4	0	0	Passed class XII with science, Arts and commerce	Nil

Bachelorof Home Science (Honours with Research)		
Programme: Bachelorof Home Science (Honours with Research)	**Year: Fourth**	**Semester: Eighth** **Paper: DSE-13**
Subject- Home Science		
Course- DSE-13	**Course Title: Advanced Community Nutrition**	

Course outcomes: The Student at the completion of the course will be able to:

- Understand the concepts of community nutrition
- Analyze public health nutrition problems
- Evaluate national nutrition programmes and policies

Credits: 4	**Discipline Specific Elective**
Max. Marks: As per Univ. rules	**Min. Passing Marks:** As per Univ. rules

Unit	Topics	No. of hours
I	**Methods for assessing nutritional status: indirect methods-** demography, population dynamics and vital events and their health implications, indicators of health and nutrition (IMR, TMR, MMR); **direct methods-** anthropometry, biochemical, clinical, dietary and functional methods of assessments.	5
II	**Pregnancy:** physiological adjustments, nutritional requirements, nutritional status of Indian pregnant women, effect of malnutrition on outcome of pregnancy.	5
III	**Lactation:** physiology of lactation, factors affecting lactation, nutritional requirements, effect of lactation on maternal malnutrition and fertility	5

IV	**Infancy:** growth and development, nutritional requirements, feeding pattern, compositional differences between human milk and milk substitute and their suitability for infant feeding. weaning practices, weaning and supplementary foods.	5
V	**Preschool age:** growth and development, nutritional requirements, special care in feeding them, nutritional problems specific to this age.	5
VI	**School age and adolescent:** growth and development, nutritional requirements, special care in feeding preschoolers, nutritional problems specific to this age.	5
VII	**Young adults:** nutritional requirements, nutritional status of Indian adult population, nutritional problems common to this age.	5
VIII	**Elderly:** nutritional requirements, special needs, nutritional problems.	5
IX	**Major nutritional problems prevalent in India:** prevalence, causes, manifestation and prevention.	5
X	**Food security:** definition, national and household food security, factors affecting food security system, national and international systems to improve food security.	5
XI	**Nutrition policy and programs: national nutrition policy,** need for nutrition policy, policy strategies and their implementation; **nutrition programs-** National Anemia Prevention, prevention of night blindness, National Iodine Prophylaxis Program, ICDS, national nutrition surveillance system, food for work etc; NGO in community development operations.	5
XII	**Nutrition education-** rationale, planning, execution and evaluation.	5

Suggested Readings:

- Gopaldas, T. & Seshadri, S. 1987. Nutrition Monitoring and Assessment. Oxford University Press.
- Jeanette B Endres. 1990. Community Nutrition Challenges and Oppurtunities. Merill.
- Mclaren D. S. 1977. Nutrition in the Community. John Wiley& Sons.
- Shukla, P. K. 1982. Nutritional Problems of India. Prentice Hall of India.

Suggested equivalent online courses: On Swayam, Vidyamitra.inflibnet.ac.in, literature-study-online.com, epg-pathshala, egyankosh.ac.in

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Semester-VIII

Bachelor of Home Science (Honours with Research)

DISCIPLINE SPECIFIC ELECTIVE (DSE-14)- Practical based on Principles of Food Preservation and Advanced Community Nutrition

No. of Hours-120

CREDIT DISTRIBUTION, ELIGIBILITYAND PRE-REQUISITES OF THE COURSE

Course Title	Credits	Credit distribution of the course			Eligibility Criteria	Pre-requisite ofthe course (if any)
		Lecture	Tutorial	Practical/ Practice		
DSE-14 Practical based on Principles of Food Preservation and Advanced Community Nutrition	4	0	0	4	Passed class XII with science, Arts and commerce	Nil

Bachelorof Home Science (Honours with Research)		
Programme: Bachelor of Home Science (Honours with Research)	Year: Fourth	Semester: Eighth Paper: DSE-14

Subject- Home Science	
Course- DSE-14	Course Title: Practical based on Principles of Food Preservation and Advanced Community Nutrition

Course outcomes: The Student at the completion of the course will be able to:

- Learn different food processing techniques and various methods used to preserve foods
- Analyze public health nutrition problems
- Evaluate national nutrition programmes and policies

Credits: 4	**Discipline Specific Elective**
Max. Marks: As per Univ. rules	**Min. Passing Marks:** As per Univ. rules

Unit	Topics	No. of hours
I	Preparation and pasteurization of fruit juice	10
1I	Dehydration and drying of fruits and vegetables, Preservation by freezing and refrigeration	10
III	Preparation of Jam, Jelly & squash	10
IV	Blanching of seasonal fruits and vegetables	10

V	Pickle preparation	10
VI	Visit to Food Processing Industry	10
VII	Planning and conducting diet survey in a rural / urban area (different age groups and Socioeconomic status may be included)	10
VIII	Planning and organizing nutrition education programs in the community.	10
IX	Processing of the data- data entry using statistical package and formulation of tables.	10
X	Application of statistical methods - Mean, frequency, SD, chi-square and F- test.	10
XI	Interpretation of results and preparation of reports using different graphical and tabular presentation.	10
XII	Visit to ICDS centre	10

Suggested Readings:

- Srilakshmi B. 2001. Food Science. New Age International.
- Mudami, S. 1997. Food Science. New Age International (P) Limited Pub.
- Gopaldas, T. & Seshadri, S. 1987. Nutrition Monitoring and Assessment. Oxford University Press.
- Jeanette B Endres. 1990. Community Nutrition Challenges and Oppurtunities. Merill.

Suggested equivalent online courses: On Swayam, Vidyamitra.inflibnet.ac.in, literature-study-online.com, epg-pathshala, egyankosh.ac.in

Suggested Continuous Evaluation Methods: Seminar/ Presentation on any topic of the above syllabus Test with multiple choice questions/ short and long answer questions Attendance

Semester-IX
Master in Home Science (Food and Nutrition)
DISCIPLINE SPECIFIC ELECTIVE (DSC 21) - Clinical Nutrition and Dietetics
No. of Hours-60

CREDIT DISTRIBUTION, ELIGIBILITYAND PRE-REQUISITES OF THE COURSE

Course Title	Credits	Credit distribution of the course			Eligibility Criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/Practice		
DSC- 21 Clinical Nutrition and Dietetics	4	4	0	0	Passed B.Sc. with Home Science or Science	Nil

Master in Home Science (Food and Nutrition)		
Programme/Class: Master in Home Science (Food and Nutrition)	**Year: Fifth**	**Semester: Ninth Paper- DSC-21**
Course : DSC-21	**Course Title: Clinical Nutrition and Dietetics**	

Course outcomes:
The student at the completion of the course will be able to:

- Understand the basics of normal diet, therapeutic diet related with specific disease condition
- Students will be able to know different feeding methods used in hospitals.

Credits: 4	**Discipline Specific Course**
Max. Marks: As per Univ. rules	**Min. Passing marks: As per Univ. rules**

Practical	Topics	No. of Lectures
I	**Introduction to Clinical Nutrition and Dietetics;** Definition and role of dietitian in Health Care; The Nutritional Care Process (NCP) - Nutrition assessment, Nutrition diagnosis, Nutrition intervention, Nutrition monitoring and evaluation, Documentation	5
II	Adaptation of therapeutic diets- Therapeutic diets, types of dietary adaptations for therapeutic needs, normal nutrition: a base of therapeutic diets; diet prescription, routine hospital diets- normal or generic diets, liquid diets, soft diets; Mode of feeding- oral feeding, tube or enteral feeding, peripheral vein feeding, total parenteral nutrition.	5
III	Nutritional care in weight management: weight imbalance- classification, calculation of ideal body weight; obesity- etiology, energy balance, metabolic changes and clinical manifestations, consequences, management of obesity- dietary and lifestyle modifications, pharmaceutical management, surgical management, preventive aspects; underweight- etiology, metabolic changes and clinical manifestations, dietary management.	5
IV	Nutritional management of coronary heart disease (CHD): prevalence,	5

	etiology and pathophysiology of CHD; common disorders of CHD and their management- dyslipidemia, atherosclerosis, hypertension, angina pectoris, hypertension, myocardial infarction, congestive cardiac failure, rheumatic heart disease; prevention of CHD.	
V	Nutritional management of metabolic diseases: diabetes mellitus- prevention, classification, etiology, metabolic changes, symptoms, diagnosis, complications and management; gout- role of protein and purines, etiopathology, clinical features and complications, management; inborn errors of metabolism- phenylketonuria, tyrosinemia, maple syrup urine disease, homocystinuria, galactosemia.	5
VI	Nutritional management of gastrointestinal diseases and disorders: Diarrhoea, constipation, oesophagitis, gastrooesophageal reflux disease, dyspepsia, gastritis, diverticular disease, steatorrhoea, lactose intolerance, inflammatory bowel disease.	5
VII	Nutritional management in liver, gall bladder and pancreatic diseases: Liver disease- viral hepatitis, liver cirrhosis, hepatic encephalopathy; gall bladder and billiary tract disease; acute and chronic pancreatitis	5
VIII	Nutritional management of renal diseases- etiology, clinical and metabolic manifestations and dietary management of acute and chronic nephritis, nephrotic syndrome, acute and chronic renal failure, end stage renal disease and renal calculi.	5
IX	Nutritional management of neurological disorders- etiology, clinical features and nutritional management of dysphagia, alzheimer's disease, parkinson's disease, epilepsy, neuro trauma and spinal trauma.	5
X	Nutritional management of cancer: Development, characteristics and identification of cancer cells, etiology factors, clinical manifestation, nutritional requirement, dietary management and prevention	5
XI	Nutritional management of infections and fevers: defense mechanism in the body, nutrition and infection, metabolic changes during infection, classification and etiology of fever/infection, typhoid, tuberculosis, HIV infection and AIDS	5
XII	Nutritional management of eating disorders- anorexia nervosa, bulimia nervosa, binge eating, management of eating disorders	5

Suggested Readings:

- Anderson L., Dibble M.V., Turkki P.R., Mitchel H.S. & Rynbergen H.1982. Nutrition in Health and Disease. JB Lippincott Co2
- RDA, 2020.Recommended Dietary Allowance for Indians.ICMR.
- Khanna K., Gupta S., Seth R.& Puri S.1997.TextBook of Nutrition and Dietetics.PhoenixPubl. Srilakshmi B.2002.Nutrition Science.New Age International.
- Swaminathan, M.1988. Principles of Nutrition and Dietetics.BAPPCO.

Suggested equivalent online courses: On Swayam, Vidyamitra.inflibnet.ac.in, literature-

study- online.com, epg-pathshala, egyankosh.ac.in

Suggested Continuous Evaluation Methods: Seminar/ Presentation on any topic of the above syllabus Test with multiple choice questions/ short and long answer questions Attendance

Semester-IX
Master in Home Science (Food and Nutrition)
DISCIPLINE SPECIFIC ELECTIVE DSE-15 - Food Microbiology

No. of Hours-60

CREDIT DISTRIBUTION, ELIGIBILITYAND PRE-REQUISITES OF THE COURSE

Course Title	Credits	Credit distribution of the course			Eligibility Criteria	Pre-requisiteof the course (if any)
		Lecture	Tutorial	Practical/Practice		
DSE-15- Food Microbiology	4	4	0	0	Passed B.Sc. with Home Science or Science	Nil

Master in Home Science (Food and Nutrition)		
Programme/Class: Master in Home Science (Food and Nutrition)	**Year: Fifth**	**Semester: Ninth** **Paper: DSE-15**
Subject: Home Science		
Course- DSE -15	**Course Title: Food Microbiology**	

Course outcome:
The Student at the completion of the course will be able to:
- To know about different microorganisms occurring in food.
- To be able to know food spoilage and factors responsible for food spoilage.

Credits: 4	**Discipline Specific Elective**
Max. Marks: As per Univ. Rule	**Min. Passing Marks: As per Univ. rules**

Unit	Topics	No. of Hours
I	Microbiology of foods- • Basic concepts • Role of micro-organisms in fermented foods.	10
II	Micro-organisms in foods: • Bacteria • Fungi • Yeasts • Moulds • Viruses • Parasites	10
III	Occurrence and growth of micro-organisms in food: • Microbiologyof air, water and soil, • Sources of food contamination,	10
IV	Factors affecting the growth of micro-organisms- • Nutrition, oxygen, temperature, moisture, osmotic pressure, pH, light, control and destruction of micro-organisms.	10

V	Food spoilage- • Factors responsible for food spoilage • Chemical changes due to spoilage • Spoilage of meat, poultryand fish; fruits and vegetables; cereals and • cereal products; milk and milk products; soft drinks; fruit juices, fruit preserves.	10
VI	Food hazards of microbial origin: • Food borne diseases; • Food borne intoxications- staphylococcal poisoning, bacillus cereus poisoning, botulism; • Food borne infections- Salmonellosis, Shigellosis, Vibrio Parahaemolyticus gastroenteritis, E. coli Diarrhoea, Hepatitis A, Shellfish poisoning; • Food borne toxic infections- clostridium perfringens gastroenteritis, E.coli gastroenteritis, cholera, listeriosis, Yersinia Enterocolitica gastroenteritis, Campylobacter Jejuni Diarrhoea; mycotoxins	10

Suggested Readings:

- Frazier, W.C. 1988. Food Microbiology. Tata McGraw Hill

Suggested equivalent online courses: On Swayam, Vidyamitra.inflibnet.ac.in, literature-study-online.com, epg-pathshala, egyankosh.ac.in

Suggested Continuous Evaluation Methods: Seminar/ Presentation on any topic of the above syllabus Test with multiple choice questions/ short and long answer questions Attendance

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Semester-IX
Master in Home Science (Food and Nutrition)
DSE 16 – Practical on Clinical Nutrition and Dietetics

No. of Hours-120

CREDIT DISTRIBUTION, ELIGIBILITYAND PRE-REQUISITES OF THE COURSE

Course Title	Credits	Credit distribution of the course			Eligibility Criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/Practice		
DSE- 16- Practical on Clinical Nutrition and Dietetics	4	0	0	4	Passed B.Sc. with Home Science or Science	Nil

Master in Home Science (Food and Nutrition)		
Programme/Class: Master in Home Science (Food and Nutrition)	**Year: Fifth**	**Semester: Ninth Paper- DSE-16**
Course : DSE-16	**Course Title: Practical on Clinical Nutrition and Dietetics**	

Course outcomes:
The student at the completion of the course will be able to:

- Understand the basics of normal diet, therapeutic diet related with specific disease condition
- Students will be able to know different feeding methods used in hospitals.

Credits: 4	**DISCIPLINE SPECIFIC ELECTIVE**
Max. Marks: As per Univ. rules	**Min. Passing marks: As per Univ. rules**

Practical	Topics	No. of Lectures
I	Planning and preparation of normal diet for children.	10
II	Planning and preparation of diet for a hypertension patient.	10
III	Planning and preparation of diet for a renal disease patient.	10
IV	Planning and preparation of diet for a patient suffering from peptic ulcer.	10
V	Planning and preparation of diet for a patient suffering from liver disease.	10
VI	Planning and preparation of diet for a patient suffering from gastro intestinal diseases.	10
VII	Planning and preparation of diet for a patient suffering from coronary heart diseases.	20
VIII	Planning and preparation of diet for a patient suffering from – • Stress • Trauma • Surgery • Burns	20
IX	Planning and preparation of diet for an eating disorder • Anorexia nervosa • Bulimia nervosa • Binge eating	20

Suggested Readings:

- Anderson L., Dibble M.V., Turkki P.R., Mitchel H.S. & Rynbergen H.1982. Nutrition in Health and Disease. JB Lippincott Co2
- RDA, 2020.Recommended Dietary Allowance for Indians.ICMR.
- Khanna K., Gupta S., Seth R.& Puri S.1997.TextBook of Nutrition and Dietetics.PhoenixPubl. Srilakshmi B.2002.Nutrition Science.New Age International.
- Swaminathan, M.1988. Principles of Nutrition and Dietetics.BAPPCO.

Suggested equivalent online courses: On Swayam, Vidyamitra.inflibnet.ac.in, literature-study- online.com, epg-pathshala, egyankosh.ac.in

Suggested Continuous Evaluation Methods: Seminar/ Presentation on any topic of the above syllabus Test with multiple choice questions/ short and long answer questions Attendance

Semester-IX
Master in Home Science (Food and Nutrition)
DICIPLINE SPECIFIC ELECTIVE (DSE-17) – Basics of Nutrition and Hygiene

No. of Hours-60

CREDIT DISTRIBUTION, ELIGIBILITYAND PRE-REQUISITES OF THE COURSE

Course Title	Credits	Credit distribution of the course			Eligibility Criteria	Pre-requisite of the course(if any)
		Lecture	Tutorial	Practical / Practice		
DSE-17 - Basics of Nutrition and Hygiene	4	4	0	0	Passed B.Sc. with Home Science or Science	Nil

Master in Home Science (Food and Nutrition)		
Programme/Class: Master in Home Science (Food and Nutrition)	**Year: Fifth**	**Semester: Ninth** **Paper: DSE-17**
Subject: Home Science		
Course- DSE- 17	**Course Title: Basics of Nutrition and Hygiene**	

Course outcome:
The student at the completion of the course will be able to:
- Students will get familiar with different methods of cooking.
- Acquaint students with practical knowledge of nutrient-rich foods.

Credits: 4	**Discipline Specific Elective**
Max. Marks: As per Univ. Rule	**Min. Passing Marks: As per Univ. rules**

Unit	Topics	No. of Hours
I	Introduction to food and its functions, food groups, meaning of nutrition, concept of health.	10
II	Composition, classification, functions, sources, digestion, absorption and utilization of macronutrients (Carbohydrates, Fat, Protein) and Energy.	10
III	Composition, functions, sources, digestion, absorption and utilization of micronutrients (Vitamins and Minerals), sources, functions, requirement and deficiency diseases.	15
IV	Food Spoilage, factors contributing to food spoilage, personal hygiene, evaluating food for freshness, evaluating canned food for spoilage, food hygiene during cooking and serving, public health department and food sanitation. Food sanitation at household level.	15
V	Agents of contamination, sources and reservoirs of infection, modes of transmission of infection, mode of entry into a susceptible host, prevention and control of infection and disease.	10

Suggested Readings:

- Dr. Brinda Singh, Manav Sharirevam Kriya Vigyan Panchcheel Prakashan, Jaipur, 2015, 15th Ed.
- Chatterjee, C.C, "Human Physiology" Medical Allied Agency: Vol I, II.

Sumati R Mudami, "Fundamentals of food Nutrition and Diet Therapy",New Age International Pvt. Ltd, New Delhi, 6th Ed. (2018)
Punita Sethi and Poonam Lakda, "Aahar Vigyan, Suraksha evam Poshan"; Elite Publishing House, New Delhi; 2015
Dr. Anita Singh, Aahar Evam Poshan Vigyan, star Publication, Agra
Dr. Devina Sahai, Aahar Vigyan, New Age International Publishers, New Delhi

Suggested equivalent online courses: On Swayam, Vidyamitra.inflibnet.ac.in, literature-study-online.com, epg-pathshala, egyankosh.ac.in

Suggested Continuous Evaluation Methods: Seminar/ Presentation on any topic of the above syllabus □ Test with multiple choice questions/ short and long answer questions □ Attendance

Semester-X
Master in Home Science (Food and Nutrition)

DISCIPLINE SPECIFIC COURSE (DSC-22) - Nutrition through Life Cycle

No. of Hours-60

CREDIT DISTRIBUTION, ELIGIBILITYAND PRE-REQUISITES OF THE COURSE

Course Title	Credits	Credit distribution of the course			Eligibility Criteria	Pre-requisiteof the course (if any)
		Lecture	Tutorial	Practical/Practice		
DSC-22 Nutrition Through Life Cycle	4	4	0	0	Passed B.Sc. with Home Scienceor Science	Nil

Master in Home Science (Food and Nutrition)		
Programme/Class: Master in Home Science (Food and Nutrition)	**Year: Fifth**	**Semester: Tenth** **Paper: DSC-22**
Subject: Home Science		
Course- DSC-22	**Course Title: Nutrition Through Life Cycle**	

Course outcome:
The Student at the completion of the course will be able to:
- Know the role of diet in preventing the degenerative diseases
- Know the major milestones in different age groups.

Credits: 4	**Discipline Specific Course**
Max. Marks: As per Univ. Rule	**Min. Passing Marks: As per Univ. rules**

Unit	Topics	No. of Hours
I	Nutritional status: malnutrition, under nutrition, over nutrition, factors associated with malnutrition, morbidity, and mortality. Global and national data on malnutrition, recommended dietary intake.	10
II	Nutritional in Pregnancy and Lactation: Stages of gestation, maternal weight gain, complications of pregnancy, nutritional problems and dietary management, the importance of nutrition during and before pregnancy, teenage pregnancy - nutritional problems, and dietary management. Nutrition in Lactation: Physiology of lactation, hormonal control, and reflex action, the efficiency of milk production, problems of breastfeeding, the nutritional composition of breast milk, nutritional concerns during lactation, special foods during lactation, dietary modification.	15

III	Nutrition in Infancy, Pre-School and School Children Infant feeding: nutritional needs, premature infant and their feeding, weaning foods. Feeding problems, infant formulae lactose intolerance. Nutrition in Pre-school - Physiological development related to nutrition, feeding problems, behavioral characteristics, nutritional requirement. Nutrition in school children - feeding school children and factors to be considered. Nutritional requirements, feeding problems.	15
IV	Nutrition in Adolescents and Adults – Physical changes, Nutritional requirements dietary practices, Nutritional problems.	10
V	Geriatric Nutrition- Nutritional requirements of the elderly & dietary management to meet nutritional needs.	10

Suggested Readings:

- Srilakshmi B, Dietetics, sixth edition, New age Publishing Press, New Delhi, 2011 2.
- Gopalan C., Ramanathan, P.V. Balasubramanian, S.C., Nutritive value of Indian foods, NIN, Hyderabad, 2001.

Suggested equivalent online courses: On Swayam, Vidyamitra.inflibnet.ac.in, literature-study-online.com, epg-pathshala, egyankosh.ac.in

Suggested Continuous Evaluation Methods: Seminar/ Presentation on any topic of the above syllabus Test with multiple choice questions/ short and long answer questions Attendance

Semester-X
Master in Home Science (Food and Nutrition)
DICIPLINE SPECIFIC ELECTIVE (DSE-18) – Food Quality Analysis

No. of Hours-60

CREDIT DISTRIBUTION, ELIGIBILITYAND PRE REQUISITES OF THE COURSE

Course Title	Credits	Credit distribution of the course			Eligibility Criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/Practice		
DSE-18 Food Quality Analysis	4	4	0	0	Passed B.Sc. with Home Science or Science	Nil

Master in Home Science (Food and Nutrition)		
Programme/Class: Master in Home Science (Food and Nutrition)	**Year: Fifth**	**Semester: Tenth** **Paper: DSE-18**
Subject: Home Science		
Course- DSE-18	**Course Title: Food Quality Analysis**	

Course outcome:
The Student at the completion of the course will be able to:
- To understand physical, rheological properties of foods
- To get acquainted with sensory analysis of food.
- To get knowledge about food intoxicants.

Credits: 4	**Discipline Specific Elective**
Max. Marks: As per Univ. Rule	**Min. Passing Marks: As per Univ. rules**

Unit	Topics	No. of Hours
I	Chemical changes in foods during processing.	10
II	Physical and rheological properties of foods.	10
III	Changes in flavor components and natural food pigments during processing and storage.	10
IV	Bioavailability of micronutrients: vitamins and minerals.	10
V	Sensory evaluation methods for foods.	10
VI	Food intoxicants: Enzyme inhibitors; lathyrogens; goitrogens; cyanogenic glycosides; phenolics; oxalates; phytates; alkaloids; carcinogens; polycyclic aromatic hydrocarbons; allergens.	10

Suggested Readings:

AOAC. 1975. Official Methods of Analysis of the Association of Official Analytical Chemists. 12th edition, Washington. D. C.

Raghuramulu, N.; Nair, K.M. and Kalyanasundaram, S. 2003. A Manual of Laboratroy Techniques. National Institute of Nutrition. ICMR. Hyderabad.

Ranganna , S. 1986. Handbook of Analysis and Quality Control for Fruit and Vegetable Product. Tata McGraw Hill Pub. Co. Ltd., New Delhi

Suggested equivalent online courses: On Swayam, Vidyamitra.inflibnet.ac.in, literature-study-online.com, epg-pathshala, egyankosh.ac.in

Suggested Continuous Evaluation Methods: Seminar/ Presentation on any topic of the above syllabus □ Test with multiple choice questions/ short and long answer questions □ Attendance

Semester-X

Master in Home Science (Food and Nutrition)

DISCIPLINE SPECIFIC ELECTIVE (DSE- 19) Food Product Development and Marketing

No. of Hours-60

CREDIT DISTRIBUTION, ELIGIBILITYAND PRE-REQUISITES OF THE COURSE

Course Title	Credits	Credit distribution of the course			Eligibility Criteria	Pre- requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
DSE-19 Food Product Development and Marketing	4	4	0	0	Passed B.Sc. with Home Scienceor Science	Nil

Master in Home Science (Food and Nutrition)		
Programme/Class: Master in Home Science (Food and Nutrition)	**Year: Fifth**	**Semester: Tenth Paper: DSE-19**
Subject: Home Science		
Course- DSE-19	**Course Title: Food Product Development and Marketing**	

Course outcome:

The student at the completion of the course will be able to:

- To understand various aspects of the development of a food product.
- Standardize and generate the process flow chart for a new food product

Credits: 4	**Discipline Specific Elective**
Max. Marks: As per Univ. Rule	**Min. Passing Marks: As per Univ. rules**

Unit	Topics	No. of Hours
I	Product development – • Need for product development • factors influencing product development, • Sensory evaluation during product life cycle. • Trends in Social Change as a Base for New Product Development. • Food product development in India, • Advantages of new food product development and its new trends.	10

II	**Introduction to advanced technologies used in food processing** - agglomeration, agitation, air classification, membrane technology (reverse osmosis and ultra filtration), high pressure, surface heat exchanger, ohmic resistance heating, super critical extraction.	10
III	Food fortification- • Objectives • Principles • Technologies.	10
IV	Food packaging • Principles in the development of safe and protecting packing • Packaging materials (metals, glass, paper and plastics)	10
V	Sweetening agents- • Natural sweeteners • Artificial sweeteners • Composition and use of sweeteners	5
VI	Food additives- • Functions • Uses • Chemical, technological and toxicological aspects of food additives	5
VII	**Food Flavors:** spices and flavoring constituents, flavors in food industries.	5
VIII	**Entrepreneurship and marketing** - starting and managing an enterprise, entrepreneurship, advertising, marketing.	5

Suggested Readings:

- Pomeranz, Yeshajahu, ed. Food analysis: theory and practice. Springer Science & Business Media,2013.
- Nollet, Leo ML, and Fidel Toldrá, eds. Food analysis by HPLC. CRC press, 2012.
- Hart, Frank L., and Harry J. Fisher. Modern food analysis. Springer Science & Business Media, 2012.
- Fuller, Gordon W. New food product development: from concept to marketplace. CRC Press, 2016.
- Smith, Jim, and Edward Charter, eds. "Functional food product development."2011.

Suggested equivalent online courses: On Swayam, Vidyamitra.inflibnet.ac.in, literature-study- online.com, epg-pathshala, egyankosh.ac.in

Suggested Continuous Evaluation Methods: Seminar/ Presentation on any topic of the above syllabus Test with multiple choice questions/ short and long answer questions Attendance

Semester-X

Master in Home Science (Food and Nutrition)

DISCIPLINE SPECIFIC ELECTIVE (DSE- 20) Practical based on Food Quality Analysis and Food Product Development and Marketing

No. of Hours-120

CREDIT DISTRIBUTION, ELIGIBILITYAND PRE-REQUISITES OF THE COURSE

Course Title	Credits	Credit distribution of the course			Eligibility Criteria	Pre- requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
DSE-20 Practical based on Food Quality Analysis and Food Product Development and Marketing	4	0	0	4	Passed B.Sc. with Home Science or Science	Nil
Master in Home Science (Food and Nutrition)						
Programme/Class: Master in Home Science (Food and Nutrition)		Year: Fifth			Semester: Tenth Paper: DSE-20	
Subject: Home Science						
Course- DSE-20		Course Title: Practical based on Food Quality Analysis and Food Product Development and Marketing				

Course outcome:

The student at the completion of the course will be able to:

- To understand various aspects of the development of a food product.
- Standardize and generate the process flow chart for a new food product

Credits: 4	**Discipline Specific Elective**
Max. Marks: As per Univ. Rule	**Min. Passing Marks: As per Univ. rules**

Unit	Topics	No. of Hours
I	Physical tests of grain quality	15
II	Sensory evaluation of foods: Selection of panel, training of panel members, objective test of sensory evaluation and consumer acceptability	20
III	Adulteration tests: a. Milk b. Spices c. Oil d. Tea leaves **e.** Honey	20

IV	Product Development and Standardization • Cereal and Pulse Based Foods • Fruit Juices, Squash and Jams • Pickles, Ketchup, Sauce • Weaning Foods • Convenience foods, RTS, and RTE foods • Healthy Bakery foods	30
V	Marketing of a Food Product • Selection of a Product, Preparation, Standardization, and Cooking • Selection of Packaging Material, Labelling, Cost Calculation, and Marketing • Presentation of Report	30
VI	Visit to a food processing industry	5

Suggested Readings:

- Pomeranz, Yeshajahu, ed. Food analysis: theory and practice. Springer Science & Business Media,2013.
- Nollet, Leo ML, and Fidel Toldrá, eds. Food analysis by HPLC. CRC press, 2012.
- Hart, Frank L., and Harry J. Fisher. Modern food analysis. Springer Science & Business Media, 2012.
- Fuller, Gordon W. New food product development: from concept to marketplace. CRC Press, 2016.
- Smith, Jim, and Edward Charter, eds. "Functional food product development."2011.

Suggested equivalent online courses: On Swayam, Vidyamitra.inflibnet.ac.in, literature-study- online.com, epg-pathshala, egyankosh.ac.in

Suggested Continuous Evaluation Methods: Seminar/ Presentation on any topic of the above syllabus Test with multiple choice questions/ short and long answer questions Attendance