

दिल्ली विश्वविद्यालय
UNIVERSITY OF DELHI



**Bachelor of Arts Programme with Nutrition
and Health Education**

(Effective from Academic Year 2019-20)

**SYLLABUS AND SCHEME OF EXAMINATION
FOR B.A. PROGRAMME WITH NUTRITION AND HEALTH
EDUCATION**

**Three year full time programme
(Choice-Based Credit System)**



Syllabus applicable for students seeking admission in 2019 onwards

**DEPARTMENT OF HOME SCIENCE
UNIVERSITY OF DELHI
Approved in AC meeting 15.7.2019**

List of Contents

Page No.

Preamble

1. Introduction to B.A. Programme with Nutrition and Health Education	1
2. Learning Outcome-based Curriculum Framework in B.A. Programme with Nutrition and Health Education	1
2.1. Nature and Extent of the Programme in B.A. Programme with Nutrition and Health Education	1
2.2. Aims of Bachelor Degree Programme in B.A. Programme with Nutrition and Health Education	1
3. Graduate Attributes in B.A. Programme with Nutrition and Health Education	2
4. Qualification Descriptors for Graduates for B.A. Programme with Nutrition and Health Education	2
5. Programme Learning Outcomes for B.A. Programme with Nutrition and Health Education	2
6. Structure of B.A. Programme with Nutrition and Health Education	3
6.1. Credit Distribution	4
6.2. Semester-wise Distribution of Courses	5
7. Courses for B.A. Programme with Nutrition and Health Education	7-49

Preamble

The objective of any programme at Higher Education Institute is to prepare their students for the society at large. The University of Delhi envisions all its programmes in the best interest of their students and in this endeavour it offers a new vision to all its Under-Graduate courses. It imbibes a Learning Outcome-based Curriculum Framework (LOCF) for all its Under Graduate programmes.

The LOCF approach is envisioned to provide a focused, outcome-based syllabus at the undergraduate level with an agenda to structure the teaching-learning experiences in a more student-centric manner. The LOCF approach has been adopted to strengthen students' experiences as they engage themselves in the programme of their choice. The Under-Graduate Programmes will prepare the students for both, academia and employability.

Each programme vividly elaborates its nature and promises the outcomes that are to be accomplished by studying the courses. The programmes also state the attributes that it offers to inculcate at the graduation level. The graduate attributes encompass values related to well-being, emotional stability, critical thinking, social justice and also skills for employability. In short, each programme prepares students for sustainability and life-long learning.

The new curriculum of B.A. Programme with Nutrition and Health Education flexibility of programme structure while ensuring that the student gets a strong foundation in the subject and gains in-depth knowledge of all the aspects of the field.

The University of Delhi hopes the LOCF approach of the B.A. Programme with Nutrition and Health Education will help students in making an informed decision regarding the goals that they wish to pursue in further education and life, at large.

1. Introduction to B.A. Programme with Nutrition and Health Education

The Choice-Based Credit System offers flexibility of programme structure while ensuring that the student gets a strong foundation in the subject and gains in-depth knowledge of all the aspects of the field. Learning outcomes-based curriculum framework is designed around the CBCS and is intended to suit the present day needs of the student in terms of securing their path towards higher studies or employment.

Nutrition has been recognized and given a special role in national development. This programme gains more significance in light of National Nutrition Mission. The curriculum aims at training students to take up leadership roles in extension and community outreach programs. Familiarizing them with the use of newer technologies, methods in family and community linkages, and sustainable use of resources for human development are the hall mark of this programme. It aims at enriching the minds of the students who have interest in learning finer points of nutrition. Nutrition generates lot of concerns, and population at large is conscious of their diet and its relation to health. Nutrition is the key to facilitate the study and enhance the quality of human life. Its approach is therefore inherently interdisciplinary. Its curriculum engages the student through teaching and extension.

This programme aims to develop a holistic and multidimensional understanding of the basic aspects of nutrients, food science, nutritional concerns in various stages of life cycle, food safety, food security as well as the current vast spectrum of malnutrition. This programme equips the students for skill development, academic understanding, entrepreneurship, community role and employment in various fields such as community nutrition, health clinics, NGOs, etc.

2. Learning Outcome-based Curriculum Framework in B.A. Programme with Nutrition and Health Education

2.1 Nature and Extent of the Programme in B.A. Programme with Nutrition and Health Education

The student gets a B.A programme degree with Nutrition and Health Education as one of the discipline subjects. Learning outcomes specify what graduates completing the program of study are expected to know, understand and be able to do at the end of their program of study. This approach allows for flexibility and innovation in program design and syllabi development, teaching learning process, student assessment at different levels and periodic program review.

2.2 Aims of Bachelor Degree Programme in B.A. Programme with Nutrition and Health Education

The aims of B. A. Programme with Nutrition and Health Education are to:

- To enhance the capability of the student to look after her nutritional needs and the needs of her family
- To impart skills to work as a community nutrition educator and contribute towards enhancing the nutritional status of communities
- To impart entrepreneurial skills to set up a home based catering unit and provide nutrition based solutions

3. Graduate Attributes in B.A. Programme with Nutrition and Health Education

Disciplinary knowledge

- Capable of demonstrating
 - (i) comprehensive knowledge and understanding of major concepts in nutrition, health and its sub fields
 - (ii) Ability to use nutrition related tools for consultancy and extension purposes

Communication Skills

- Skilled communicator: Ability to communicate nutrition and health related knowledge to the society at large to bring about behaviour change.

Problem solving

- Sense of enquiry: Capability for asking relevant questions relating to issues and problems in the field of nutrition and formulating strategies to resolve them.

Cooperation and team work

Will be able to work in nutrition teams

Self directed learning

Will be able to provide nutrition based solutions

4. Qualification Descriptors for Graduates for B.A. Programme with Nutrition and Health Education

- Demonstrate an understanding of the academic field of nutrition and its linkages with related disciplinary areas.
- Use knowledge, understanding and skills required for identifying nutrition related issues and problems and drawing on a wide range of information and its application in addressing those issues.
- Setting up an entrepreneurial venture to offer health and nutrition based solutions and services.

5. Programme Learning Outcomes for B.A. Programme with Nutrition and Health Education

After completing the programme, the learner should be able to:

- Demonstrate the understanding of fundamentals of food, nutrition and health
- Recognize the importance of nutrition during the various stages of life.
- Demonstrate the understanding of etiology and management of nutritional disorders ranging from nutritional deficiencies to lifestyle diseases as well as common ailments
- Recognize the significance of (i) food safety, food quality, food laws and regulations (ii) ongoing national nutrition programs (iii) technologies for improving food and nutrition security
- Demonstrate skills in assessment of nutritional status
- Demonstrate skills in planning and preparing balanced diets for normal persons and in states of malnutrition/ disease
- Demonstrate skills for playing the role of nutrition/ health educators in the community
- Demonstrate entrepreneurship skills for setting up a home-based catering unit

6. Structure Of B.A. Programme With Nutrition and Health Education

Under Choice Based Credit System the programme is of 3-year duration, divided into 3 parts- Part I, Part II and Part III. Each part consists of 2 semesters. Thus there will be a total of six semesters. Each semester will consist of 15 weeks.

The programme offers 16 courses as follows:

- Discipline Specific Core (DSC) courses: 4
- Discipline Specific Elective (DSE) courses: 2
- Skill Enhancement Elective Courses (SEC): 4
- Generic Electives (GE): 2

For each course:

- Choices are given of more papers in DSE, SEC and GE.
- The detailed syllabus and list of suggested readings is appended.
- Teaching time allotted for each course is 1 hour / week / credit for theory; 2 hours/ week/ credit for practical

Each practical batch should be of 15-20 students.

6.1 Credit Distribution

Category of course	Name of Papers	Theory Credits	Practical Credits
Discipline Specific Core (DSC) Course	1. Fundamentals of Nutrition and Food Science	4	2
	2. Nutrition for the Family	4	2
	3. Introduction to Food Safety	4	2
	4. Public Health Nutrition	4	2
Discipline Specific Elective (DSE) Course	1. Public Nutrition	4	2
	2. Entrepreneurship for Small Catering Units	4	2
	3. Therapeutic Nutrition	4	2
Skill Enhancement Course (SEC)	1. Home Based Catering	4	
	2. Nutrition and Fitness	4	
	3. Bakery Science	2	2
	4. Maternal and Child Nutrition	4	
	5. Food and Nutrition	2	2
Generic Elective (GE)	1. Human Nutrition	4	2
	2. Nutrition: A Life Span Approach	4	2
	3. Current Concerns in Public Health Nutrition	4	2
	4. Culinary Food Science	4	2

6.2 Semester-wise Distribution of Courses

Semester	Core Course (CC) (12 papers)	Ability Enhancement Compulsory Course (AECC) (2 papers)	Skill Enhancement Course SEC) (4 papers)	Discipline Specific Elective (DSE) (4 papers)	Generic Elective (GE) (2 papers)
I	CC 1: English / MIL (Hindi)	AECC 1: English/MIL / (Hindi, Sanskrit) Communication/ Environmental Science	-	-	-
	CC 2: Discipline Course - 1A				
	CC 3: Discipline Course – 2 A				
II	CC 4: MIL (Hindi)/ English	AECC 2: English/MIL / (Hindi, Sanskrit) Communication/ Environmental Science	-	-	-
	CC 5: Discipline Course - 1B				
	CC 6: Discipline Course - 2B				
III	CC 7: English / MIL (Hindi)	-	SEC-1	-	-
	CC 8: Discipline Course - 1C				
	CC 9: Discipline Course - 2C				
IV	CC 10: MIL (Hindi)/ English	-	SEC-2	-	-
	CC 11: Discipline Course – 1D				
	CC 12: Discipline Course – 2D				
V	-	-	SEC-3	DSE-1A DSE-2A	GE-1
VI	-	-	SEC-4	DSE-1B DSE-2B	GE-2

12 DSC + 2 AECC + 4 SEC + 4 DSE + 2 GE = Total Credits: 132

7. Courses for B.A. Programme with Nutrition and Health Education

DISCIPLINE SPECIFIC CORE COURSE DSC- NHE: CREDITS-6

- A: Fundamentals of Nutrition and Food Science
- B: Nutrition for the Family
- C: Introduction to Food Safety
- D: Public Health Nutrition

DISCIPLINE SPECIFIC ELECTIVE (DSE) COURSE: CREDITS-6

- DSE-NHE-1: Public Nutrition (Semester V)
- DSE-NHE-2: Entrepreneurship for Small Catering Unit (Semester V)
- DSE-NHE-3: Therapeutic nutrition (Semester VI)

SKILL ENHANCEMENT ELECTIVE COURSE (SEC): CREDITS-4

- SEC-NHE-1: Home Based Catering (Semester III, V)
- SEC-NHE-2: Nutrition and Fitness (Semester IV, VI)
- SEC-NHE-3 Bakery Science (Semester IV, VI)
- SEC-NHE-4: Maternal and Child Nutrition (Semester IV, VI)
- SEC-NHE-5: Food and Nutrition (Semester III, V)

GENERIC ELECTIVE (GE) COURSE: CREDITS-6

- GE-NHE-1: Human Nutrition (Semester V)
- GE-NHE-2: Nutrition: A Life Span Approach (Semester V)
- GE-NHE-3: Current Concerns in Public Health Nutrition (Semester VI)
- GE-NHE-4: Culinary Food Science (Semester VI)

**DSC-NHE-A: FUNDAMENTALS OF NUTRITION AND FOOD SCIENCE
(CREDITS: 6; THEORY-4, PRACTICAL-2)**

COURSE OBJECTIVES:

- To familiarize students with fundamentals of food, nutrients and their relationship to health.
- To study functions, dietary sources and clinical manifestations of deficiency or excess of nutrients.
- To create awareness regarding various aspects of culinary science.

COURSE LEARNING OUTCOMES: After completion of the course the learner will be able to:

- Understand basic concepts in food and nutrition and interpret relation between food, nutrition and health.
- Know various functions of food.
- Describe functions, dietary sources and clinical manifestations of deficiency or excess of important nutrients.
- Know the advantages of cooking and understand healthy cooking practices.
- Describe various methods of cooking and the principles underlying them.
- Analyze the effect of various methods of cooking on nutrients and non-nutritional components of food.
- Understand the importance of weights and measures in cooking, prepare market order and do the table setting.
- Demonstrate skills in basic food preparation, understand nutritional quality and concept of portion size.

THEORY:

CONTENTS

PERIODS: 60 (4 credits)

UNIT I: Basic Concepts in Food and Nutrition

6

- Basic terms used in the study of food and nutrition
- Understanding relationship between food, nutrition and health
- Functions of food-physiological, psychological and social

Rekhi T &Yadav H.(2015). Fundamentals of food and nutrition. Delhi: Elite Publishing House (P) Ltd.
Chapter 1, pg 3-11

UNIT II: Nutrients

27

Functions, dietary sources and clinical manifestations of deficiency/ excess of the following:

- Carbohydrates-classification including dietary fibre
- Fat-classification of fatty acids
- Protein including protein quality
- Fat soluble vitamins A, D, E, K
- Water soluble vitamins-thiamine, riboflavin, niacin, pyridoxine, folate, vitamin B₁₂ and Vitamin C
- Minerals-calcium, iron, iodine, zinc, sodium and potassium

Rekhi T &Yadav H.(2015). *Fundamentals of food and nutrition*. Delhi: Elite Publishing House (P) Ltd.
Chapters 11-16, pg 125-248

UNIT III: Culinary Science

27

- Advantages of cooking food
- Principles of cooking
- Pre-preparation steps in cooking- an overview
- Cooking methods
-Moist heat methods

- Dry heat methods
- Methods using fat as a medium
- Others: Microwave cooking, Solar cooking
- Role of cereals, pulses, milk, eggs, fat and sugar in cookery
- Effect of cooking on food components
- Minimizing nutrient losses during food preparation

Rekhi T &Yadav H.(2015). *Fundamentals of food and nutrition*. Delhi: Elite Publishing House (P) Ltd. Chapters 2, pg 15-26

Mudambi SR & Rajagopal MV.(2012). *Fundamentals of food, nutrition and diet therapy*; (6thed). Delhi: New Age International (P) Ltd. Chapter 19-20, pg 226-240

PRACTICAL:

PERIODS: 60 (2 credits)

- Weights and measures: preparing market order and table setting.
- Food preparation, understanding the principles involved, nutritional quality and portion size.
 - Beverages: hot tea/coffee, milk shake/lassi, fruit based beverages.
 - Cereals: boiled rice, pulao, chapatti, parantha, puri, pastas.
 - Pulses: whole, dehusked.
 - Vegetables: curries, dry preparations.
 - Milk and milk products: kheer, custard.
 - Meat, fish and poultry preparations.
 - Egg preparations: boiled, poached, fried, scrambled, omelettes, egg pudding.
 - Soups: broth, plain and cream soups.
 - Baked products: biscuits/cookies, cream cakes, sponge cake preparations, tarts and pies.
 - Snacks: pakoras, cutlets, samosas, upma, poha, sandwiches.
 - Salads: salads and salad dressings.

COMPULSORY READING:

- Mudambi SR & Rajagopal MV.(2012). *Fundamentals of food, nutrition and diet therapy*; (6thed). Delhi: New Age International (P) Ltd.
- Raina U et al.(2010). *Basic food preparation-a complete manual*. (4thed). Delhi: Orient Blackswan.
- Rekhi T &Yadav H.(2015). *Fundamentals of food and nutrition*. Delhi: Elite Publishing House (P) Ltd.

ADDITIONAL RESOURCES:

- Agarwal A & Udipi SA.(2014).*Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd.
- Bamji MS, Rao NP, Reddy V.(2017).*Textbook of human nutrition*. (4thed). Delhi: Oxford and IBH Publishing co. (P) Ltd.
- Mudambi SR, Rao SM, Rajagopal MV.(2012). *Food science*.(2nded). Delhi: New Age International (P) Ltd.
- Sethi P& Lakra P (2015). *Aahar vigyan, poshan evam suraksha* (Hindi).Delhi: Elite Publishing House (P) Ltd.
- Srilakshmi B.(2018). *Nutrition science*.(6thed). Delhi: New Age International (P) Ltd.
- Srilakshmi B.(2018). *Food science*.(7thed). Delhi: New Age International (P) Ltd.
- Wardlaw GM, Hampl JS.(2019). *Perspectives in nutrition*. (11thed). New York, NY: McGraw Hill.

TEACHING LEARNING PROCESS:

- Lectures
- Use of prescribed textbooks and handouts
- Power point presentations

- Practicum

ASSESSMENT METHODS:

As per University of Delhi norms

For each course the assessment is as follows:

For theory (maximum marks 100):

-End semester exam: 75 marks

-Internal Assessment: 25 marks (Class test- 10 marks; Assignment- 10 marks; Attendance- 5 marks)

For practical (maximum marks 50):

-End-semester practical exam: 25 marks

-Continuous evaluation of practicals on a predecided key: 25 marks

KEY WORDS:

- Department of Home Science
- Nutrients
- Cooking

Facilitating the achievement of course learning objectives

Unit no.	Course learning outcomes	Teaching and learning activities	Assessment tasks
1	Students would understand key terms used in the study of food and nutrition	Interactive lectures on concepts related to food, nutrition and health	Short answer questions
2	Students would have gained knowledge of nutrients, their sources and deficiency states	Theory classes on the functions of nutrients and other concepts, pictorial representation of food sources, deficiency symptoms	Objective questions on various concepts related to nutrients
3	Students would have gained a comprehensive understanding of the art and science of cooking and its effect on nutritional value of foods	Theory classes and power point presentations describing cooking methods and their implications in nutrition	Assignment on choosing healthy cooking methods and describing recipes based on them along with the underlying principles.

***Assessment tasks listed here are indicative and may vary.**

**DSC-NHE-B: NUTRITION FOR THE FAMILY
(CREDITS: 6; THEORY-4, PRACTICAL-2)**

COURSE OBJECTIVES:

- To introduce students to the basic concepts of meal planning.
- To equip them with knowledge of physiological changes, nutritional requirements, nutritional concerns and healthy food choices during the life cycle.

COURSE LEARNING OUTCOMES: After completing the course the learner will be able to:

- Describe food groups, food pyramid and the concept of a balanced diet.
- Understand the importance of food exchange list and use them for meal planning.
- Understand the factors effecting meal planning.
- Know the features of dietary guidelines for Indians and the relevance of the same.
- Explain the physiological changes, nutritional guidelines and healthy food habits during adulthood, pregnancy, lactation and old age.
- Describe growth and development, nutritional guidelines and nutritional concerns during infancy, preschool years, school age and adolescence.
- Plan and prepare balanced meals and nutritious snacks for various age groups.

THEORY:

CONTENTS

PERIODS: 60 (4 credits)

UNIT I: Basic Concepts of Meal Planning

16

- Food groups and concept of balanced diet
- Food exchange list
- Concept of Dietary Reference Intakes
- Factors effecting meal planning and food related behavior
- Dietary guidelines for Indians and food pyramid

Food

Chadha R & Mathur P (eds).(2015). *Nutrition: a life cycle approach*.Delhi: Orient Blackswan. Chapter 2, 15-16, pg 15-30,223-251

UNIT II: Nutrition during Adult Years

24

Physiological changes, RDA, nutritional guidelines, nutritional concerns and healthy food choices for:

- Adult man and woman
- Pregnant woman
- Lactating mother
- Elderly

Chadha R & Mathur P (eds).(2015). *Nutrition: a life cycle approach*.Delhi: Orient Blackswan. Chapter 17-19, 24, pg 252-301, 355-364

UNIT III: Nutrition during Childhood

20

Growth and development, growth reference/ standards, RDA, nutritional guidelines, nutritional concerns and healthy food choices for:

- Infants
- Preschool children
- School going children
- Adolescents

PRACTICAL:

PERIODS: 60 (2 credits)

- Introduction to meal planning
- Use of food exchange lists in planning and preparation of diets and dishes for :
 - Adults
 - Pregnant and lactating women
 - Preschool child
 - School age child and adolescent
 - Elderly

COMPULSORY READING:

- Chadha R & Mathur P (eds).(2015). *Nutrition: a life cycle approach*.Delhi: Orient Blackswan.
- Khanna K et al.(2013). *Textbook of nutrition and dietetics*. Delhi: Elite Publishing House (P) Ltd.
- Longvah T et al (2017). *Indian food composition tables*. Hyderabad, Telangana: National Institute of Nutrition.
- Siddhu A, Bhatia N, Singh K, Gupta S (eds). (2017). *Lady Irwin College Technical series 6: Compilation of food exchange list*. Delhi: Global Books Organisation.

ADDITIONAL RESOURCES:

- Agarwal A & Udipi SA.(2014).*Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd.

- Edelstein S, Sharlin J (eds). (2009). *Life cycle nutrition- an evidence based approach*. Burlington, MA: Jones and Barlett Publishers.
- Wardlaw GM, Hampl JS.(2019). *Perspectives in nutrition*. (11thed). New York, NY: McGraw Hill.

TEACHING LEARNING PROCESS:

- Lectures
- Use of prescribed textbooks and handouts
- Power point presentations
- Practicum

ASSESSMENT METHODS:

As per University of Delhi norms.

For each course the assessment is as follows:

For theory (maximum marks 100):

-End semester exam: 75 marks

-Internal Assessment: 25 marks (Class test- 10 marks; Assignment- 10 marks; Attendance- 5 marks)

For practical (maximum marks 50):

-End-semester practical exam: 25 marks

-Continuous evaluation of practicals on a predecided key: 25 marks

KEY WORDS:

- Department of Home Science
- Food exchange list
- Dietary guidelines
- RDA
- Balanced diet

Facilitating the achievement of course learning objectives

Unit no.	Course learning outcomes	Teaching and learning activities	Assessment tasks
1	Students would have understood basics of meal planning and guidelines for the same	Correlating theory and use of exchange lists and food composition tables to plan balanced diets	Planning full days' diets and snacks for different age groups
2	Students would gain knowledge about the physiological considerations and nutritional needs during adult years as well as ways to meet those needs	Lectures and discussions	Class test with short and long answer questions
3	Students would gain an understanding about the development pattern and nutritional needs during childhood as well as ways to meet those needs	Theory classes on detailed account of all sub topics. Using students' imagination to develop newer healthy recipes	Class test with MCQs and subjective questions

***Assessment tasks listed here are indicative and may vary.**

**DSC-NHE-C: INTRODUCTION TO FOOD SAFETY
(CREDITS: 6; THEORY-4, PRACTICAL-2)**

COURSE OBJECTIVES:

- To impart knowledge about various aspects of food safety and hygiene and related regulations in order to create consumer awareness.

- To create awareness regarding contamination and adulteration of food and ways and means to prevent the same.

COURSE LEARNING OUTCOMES: After completing this course the learner will be able to:

- Understand how to select, purchase and store food to ensure food safety.
- Explain the importance, challenges and factors affecting food safety as well as assess food safety issues at the field level.
- Know the importance of hazards, control measures, monitoring and corrective actions regarding HACCP.
- Describe safe handling practices related to food, personnel and equipment.
- Know about food additives and their proper use in safe food production.
- Understand issues related to food adulteration and related ill effects.
- Interpret and prepare food labels.
- Describe ways in which food-borne micro-organisms can cause illness in the body and give examples.
- Understand the role of FSSAI in ensuring food quality and safety.

THEORY:

CONTENTS

PERIODS: 60 (4 credits)

UNIT I: Foods

10

Nutritional contribution, selection and storage of the following:

- Cereals and cereal products
- Pulses
- Oils and fats
- Sugars
- Vegetables and fruits
- Milk and milk products
- Eggs and flesh foods

Mudambi SR & Rajagopal MV.(2012). *Fundamentals of food, nutrition and diet therapy*; (6th ed). Delhi: New Age International (P) Ltd. Chapter 18, pg 213-225

UNIT II: Food safety

35

- Concept, importance and challenges to food safety, factors affecting food safety
- Contamination of food and safe food handling practices; street food safety
- Food safety measures: basic concept of HACCP
- Food regulations
 - Codex Alimentarius
 - Food Safety and Standards (FSS) Act: Features and Regulations
- Definition and benefits of food additives
- Types of additives
 - Preservatives
 - Antioxidants
 - Sweeteners
 - Food colours
 - Flavouring agents
 - Emulsifying and stabilizing agents
 - Leavening agents
- Safety of food additives
- Nutrition labelling

Suri S & Malhotra A.(2014). *Food Science, Nutrition and Safety*. Delhi: Pearson. Chapters 20,24,25-28, pg 263-271;332-333, 335-370

Mathur P.(2018). *Food safety and quality control*; Delhi: Orient Blackswan. Chapter 15, pg 250-265.

Chadha R & Mathur P (eds).(2015). *Nutrition: a life cycle approach*.Delhi: Orient Blackswan. Chapters 14, pg 204-219

UNIT III: Adulteration and Contamination

15

- Definition of food adulteration
- Adulterants in commonly consumed food items and their ill effects
- Food and water borne illnesses- bacterial, viral and fungal-and their prevention

Mathur P.(2018). *Food safety and quality control*; Delhi: Orient Blackswan. Chapter 4-5,11, pg 68-101, 178-196.

Sethi P& Lakra P (2015). *Aahar vigyan, poshan evam suraksha* (Hindi). Delhi: Elite Publishing House (P) Ltd. Chapter 22, pg 381-406

PRACTICAL :

PERIODS: 60 (2 credits)

- Market survey of preserved fruit and vegetable products
- Evaluation of a food label
- Development of a food label
- Simple tests to detect food adulteration
- Case study on food safety issues

COMPULSORY READING:

- Mathur P.(2018). *Food safety and quality control*; Delhi: Orient Blackswan.
- Sethi P& Lakra P (2015). *Aahar vigyan, poshan evam suraksha* (Hindi). Delhi: Elite Publishing House (P) Ltd.
- Suri S & Malhotra A.(2014). *Food Science, Nutrition and Safety*. Delhi: Pearson.

ADDITIONAL RESOURCES:

- Agarwal A & Udipi SA.(2014). *Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd.
- Chadha R & Mathur P (eds).(2015). *Nutrition: a life cycle approach*.Delhi: Orient Blackswan. Chapters 14, pg 204-219
- Mudambi SR & Rajagopal MV.(2012). *Fundamentals of food, nutrition and diet therapy*; (6th ed). Delhi: New Age International (P) Ltd.
- Rekhi T &Yadav H.(2015). *Fundamentals of food and nutrition*. Delhi: Elite Publishing House (P) Ltd.
- Srilakshmi B.(2018). *Food science*. (7th ed). Delhi: New Age International (P) Ltd.
- *The Food Safety and Standards Act 2006* (2018). (11th ed). Delhi: Commercial Law Publishers (India) (P) Ltd.

WEBSITES:

Food Safety and Standards Authority of India: <http://www.fssai.gov.in>

TEACHING LEARNING PROCESS:

- Lectures
- Practicum and field based training
- Use of prescribed textbooks and handouts
- Power-point presentations

ASSESSMENT METHODS:

As per University of Delhi norms

For each course the assessment is as follows:

For theory (maximum marks 100):

-End semester exam: 75 marks

-Internal Assessment: 25 marks (Class test- 10 marks; Assignment- 10 marks; Attendance- 5 marks)

For practical (maximum marks 50):

-End-semester practical exam: 25 marks

-Continuous evaluation of practicals on a predecided key: 25 marks

KEYWORDS:

- Department of Home Science
- Food safety
- Food standards

Facilitating the achievement of course learning objectives

Unit no.	Course learning outcomes	Teaching and learning activities	Assessment tasks
1	Students would gain knowledge regarding role of different foods, their purchase and proper storage	Structured lectures and pictorial presentation, where relevant	Class test with objective and long answer questions
2	Students would understand the importance of food safety and hygiene and ways and means to ensure it. They would also become aware of food additives and food labels in the context of processed foods.	Theory classes and hands on experience of conducting market survey of processed foods	Case study of food service establishment to gain an insight into food safety and hygiene issues
3	Students would become aware of the dangers of food adulteration and become an enlightened consumer	Lecture, discussion and presentation of case studies involving food poisoning and other food related illnesses	Objective type test along with practical detection of adulteration

***Assessment tasks listed here are indicative and may vary.**

**DSC-NHE-D: PUBLIC HEALTH NUTRITION
(CREDITS: 6; THEORY-4, PRACTICAL-2)**

COURSE OBJECTIVES:

- To enable students to identify and contribute to the prevention of public health problems in the country.
- To equip students with knowledge to deal with nutrition for special conditions.
- To create awareness of recent concerns of food security and technologies for improving food and nutrition security.

COURSE LEARNING OUTCOMES: After completion of the course the learner will be able to:

- Understand the Public Health Nutrition concept and health care system operating in the country.
- Identify the causes, symptoms, prevention and treatment of various deficiency diseases.
- Assess the ill effects of smoking, alcoholism and drug addiction on health.
- Know the causes and prevention of AIDS and AIDS control programme.
- Understand the importance of nutrition for physical fitness and sport.
- Analyze the feeding problems of children with special needs and resolve them.
- Know the nutritional needs during calamities and emergencies.
- Describe concepts related to food security and identify the technologies and programs for improving food and nutrition security.
- Plan and prepare diet and snacks for persons suffering from various deficiency diseases.

THEORY:

CONTENTS

PERIODS: 60 (4 credits)

UNIT I: Introduction to Public Health Nutrition

3

- Definition of Public Health Nutrition
- Levels of health care services

Sharma S & Wadhwa A. (2003). *Nutrition in the community- a textbook*. Delhi: Elite Publishing House (P) Ltd. Chapter 1.1 pg 3-15

UNIT II: Nutritional Deficiency Diseases

15

Causes, symptoms, treatment, prevention of the following:

- Protein Energy Malnutrition (PEM)
- Vitamin A Deficiency (VAD)
- Iron Deficiency Anaemia (IDA)
- Iodine Deficiency Disorders (IDD)
- Zinc Deficiency
- Vitamin D deficiency
- Fluorosis

Bamji MS, Rao NP, Reddy V. (2017). *Textbook of human nutrition*. (4thed). Delhi: Oxford and IBH Publishing co. (P) Ltd. Chapters 18-21,30; Pg 265-321, 445-461

Agarwal A & Udipi SA. (2014). *Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd. Chapter 6,12, pg 187-193, 426-458

UNIT III: Social Health Problems

12

- Smoking
- Alcoholism
- Drug addiction
- AIDS including AIDS control Programme

School of Open Learning, NHE Study Material-1, lesson-18, *Social Health Problems* (e-resource)

UNIT IV: Nutrition for Special Conditions

15

- Introduction to nutrition for physical fitness and sport
- Feeding problems in children with special needs
- Considerations during natural and man-made disasters e.g. floods, war - basic guidelines in disaster management.

Chadha R & Mathur P (eds). (2015). *Nutrition: a lifecycle approach*. Delhi: Orient Blackswan. Chapter 26, pg 379-390

Agarwal A & Udipi SA. (2014). *Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd. Chapter 14, pg 536-542

UNIT V: Food and Nutrition Security

15

- Key terms, pillars of food security, challenges
- Technologies for food and nutrition security
- National programs for ensuring food and nutrition security

Agarwal A & Udipi SA. (2014). *Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd. Chapter 13, pg 488-520

PRACTICAL:

PERIODS: 60 (2 credits)

Planning and preparation of:

- Full day's diet for a child suffering from PEM
- Snacks/ dishes for PEM, VAD and IDA for children, pregnant and lactating women.

COMPULSORY READING:

- Agarwal A & Udipi SA. (2014). *Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd.

- Bamji MS, Rao NP, Reddy V.(2017).*Textbook of human nutrition*. (4thed). Delhi: Oxford and IBH Publishing co. (P) Ltd.
- Chadha R &Mathur P (eds).(2015). *Nutrition: a lifecycle approach*. Delhi: Orient Blackswan.

ADDITIONAL RESOURCES:

- Bamji MS, Rao NP, Reddy V.(2017).*Textbook of human nutrition*. (4thed). Delhi: Oxford and IBH Publishing co. (P) Ltd.
- Gibney et al.(2004). *Public health nutrition*. Hoboken, NJ: Blackwell Publishing.
- Khanna K et al.(2013). *Textbook of nutrition and dietetics*; Delhi: Elite Publishing House (P) Ltd.
- Longvah T et al (2017). *Indian food composition tables* .Hyderabad, Telangana: National Institute of Nutrition.
- Mudambi SR &Rajagopal MV.(2012). *Fundamentals of food, nutrition and diet therapy*; (6thed). Delhi: New Age International (P) Ltd.
- Raina U et al.(2010). *Basic food preparation-a complete manual*. (4thed). Delhi: Orient Blackswan.
- Sethi P&Lakra P (2015). *Aahar vigyan, poshan evam suraksha (Hindi)*.Delhi: Elite Publishing House (P) Ltd.
- Sharma S &Wadhwa A. (2003). *Nutrition in the community- a textbook*. Delhi: Elite Publishing House (P) Ltd.
- Siddhu A, Bhatia N, Singh K, Gupta S (eds). (2017). *Lady Irwin College Technical series 6: Compilation of food exchange list*. Delhi: Global Books Organisation.
- Srilakshmi B.(2019). *Dietetics*. (8th ed).Delhi. New Age International (P) Ltd.
- Vir S. (2011). *Public health nutrition in developing countries Vol I and II*. Delhi: Woodhead Publishing.

TEACHING LEARNING PROCESS:

- Lectures
- Use of prescribed methods and handouts
- Power point presentation
- Practicum

ASSESSMENT METHODS:

As per University of Delhi norms

For each course the assessment is as follows:

For theory (maximum marks 100):

-End semester exam: 75 marks

-Internal Assessment: 25 marks (Class test- 10 marks; Assignment- 10 marks; Attendance- 5 marks)

For practical (maximum marks 50):

-End-semester practical exam: 25 marks

-Continuous evaluation of practicals on a predecided key: 25 marks

KEYWORDS:

- Department of Home Science
- Deficiency disease
- Food security
- Physical fitness

Facilitating the achievement of course learning objectives

Unit no.	Course learning outcomes	Teaching and learning activities	Assessment tasks
1	Students will get an overview of various aspects of public health	Theory class	Class test

	nutrition		
2	Students would get an in-depth knowledge of various nutritional deficiencies and their public health significance	Lectures, power point presentations, discussion and searching e-resources on latest developments	Applicable based objective and long answer question
3	Students will get an insight into ill effects of social health problems and ways to treat them	Discussions	Preparing public education material to create awareness about social health problems
4	Students would gain an understanding of the importance of nutrition for fitness. They would learn how to deal with children with feeding problems and nutritional management in disasters	Lectures, visual presentation, discussion	Class test
5	Students will gain knowledge of the concept of food security and the steps that can be taken to achieve the same	Theory class supplemented with searching e-resources for latest government programmes	Case study on devising a strategy for improving food and nutrition security in a given set-up; short and long answer questions

***Assessment tasks listed here are indicative and may vary.**

**DSE-NHE-1: PUBLIC NUTRITION
(CREDITS: 6; THEORY-4, PRACTICAL-2)**

COURSE OBJECTIVES:

- To make students aware of public nutrition concept and various national nutrition programmes.
- To impart knowledge of various methods of assessment of nutritional status.
- To explain the role of nutrition education in bringing about behavior change.

COURSE LEARNING OUTCOMES: After completing the course, the learner will be able to:

- Understand the concept and scope of public nutrition and know the role of Public Nutritionist
- Explain various other government programmes implemented to overcome malnutrition.
- Understand objectives and importance of assessment of nutritional status.
- Interpret direct and indirect methods of assessment of nutritional status.
- Know about objectives, principle and scope of nutrition education.
- Analyze importance of communication for behaviour change.
- Understand how to plan a nutrition education programme for a community and use suitable methods/ tools for its implementation.
- Assess the diet by FFQ and 24 hour recall method.
- Plan and cook low cost nutritious recipes for various age group.
- Plot and interpret growth charts.

THEORY:

CONTENTS

PERIODS: 60 (4 credits)

UNIT I: Concept and Scope of Public Nutrition

5

- Definition and multidisciplinary nature of public nutrition
- Concept and scope
- Role of public nutritionist

Sharma S &Wadhwa A. (2003). *Nutrition in the community- a textbook*. Delhi: Elite Publishing House (P) Ltd. Chapter 1.1, pg 3-5

IGNOU.(2017). MFN006, *Public Nutrition*, Delhi. Unit 1, pg 9-11,21-22

UNIT II: National Nutrition Programmes

15

- ICDS
- Mid-day Meal Programme
- Programmes for prevention of anaemia, vitamin A deficiency and iodine deficiency disorders
- National Nutrition Mission

IGNOU.(2017). MFN006, *Public Nutrition*, Delhi. Unit 10, pg 203-215

Programme Evaluation Organization, Planning Commission, GOI, (March 2011), *Evaluation study on ICDS, Vol I*, New Delhi. Pg 1-16

Niti Ayog, GOI (2017) *Nourishing India – National Nutrition Strategy*. New Delhi. Chapters 3-6, pg 24-38

UNIT III: Assessment of Nutritional Status

15

- Objectives and importance
- Methods of assessment
 - Direct: clinical signs, nutritional anthropometry, biochemical and biophysical tests
 - Indirect: diet surveys, vital statistics

Sharma S &Wadhwa A. (2003). *Nutrition in the community- a textbook*. Delhi: Elite Publishing House (P) Ltd. Chapter 5.1, pg 165-189

Bamji MS, Rao NP, Reddy V.(2017). *Textbook of human nutrition*. (4thed). Delhi: Oxford and IBH Publishing co. (P) Ltd.Chapter 8-10, pg 113-153

UNIT IV: Nutrition Education

25

- Objectives, principles and scope of nutrition and health education and promotion
- Behaviour Change Communication
- Planning a nutrition education programme for the community
- Teaching methods/ teaching aids: demonstration, flash cards and flip books, traditional folk media, electronic media, print media, computers and internet

Park K.(2015). *Textbook of preventive and social medicine*. (23rded). Jabalpur, MP: Banarsidas Bhanot Publishers. Chapter 19, pg 861-867

IGNOU.(2017). MFN006, *Public Nutrition*, Delhi. Unit 15-16, pg 331-367

PRACTICAL:

PERIODS: 60 (2 credits)

- Modifying local recipes for behaviour change communication.
- Assessment of Nutritional Status:
 - Anthropometry- weight and height measurements.
 - Plotting and interpretation of growth charts for children below 5 years.
 - Identification of clinical signs of common nutritional disorders.
 - Dietary assessment- FFQ and 24 hour diet recall.
- Use of teaching method/ teaching aid for nutrition education.

COMPULSORY READING:

- Agarwal A &Udipi SA.(2014). *Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd.
- Bamji MS, Rao NP, Reddy V.(2017). *Textbook of human nutrition*. (4thed). Delhi: Oxford and IBH Publishing co. (P) Ltd.
- IGNOU.(2017). MFN006, *Public Nutrition*, Delhi.
- Sharma S &Wadhwa A. (2003). *Nutrition in the community- a textbook*. Delhi: Elite Publishing House (P) Ltd.

- Supe SV.(2015). *Textbook of extension education*. (2nded). Udaipur, Rajasthan: Agrotech Publishing.

ADDITIONAL RESOURCES:

- Gibney et al.(2004). *Public health nutrition*. Hoboken, NJ: Blackwell Publishing.
- Niti Ayog, GOI (2017) *Nourishing India – National Nutrition Strategy*. New Delhi. Chapters 3-6, pg 24-38
- Park K.(2015). *Textbook of preventive and social medicine*. (23rded). Jabalpur, MP: Banarsidas Bhanot Publishers.
- Programme Evaluation Organization, Planning Commission, GOI, (March 2011), *Evaluation study on ICDS, Vol I*, New Delhi. Pg 1-16

TEACHING LEARNING PROCESS:

- Lectures
- Use of prescribed textbooks and handouts
- Power point presentations
- Practicum

ASSESSMENT METHODS:

As per University of Delhi norms

For each course the assessment is as follows:

For theory (maximum marks 100):

-End semester exam: 75 marks

-Internal Assessment: 25 marks (Class test- 10 marks; Assignment- 10 marks; Attendance- 5 marks)

For practical (maximum marks 50):

-End-semester practical exam: 25 marks

-Continuous evaluation of practicals on a predecided key: 25 marks

KEYWORDS:

- Department of Home Science
- Public nutrition
- Nutritional status
- Nutrition education

Facilitating the achievement of course learning objectives

Unit no.	Course learning outcomes	Teaching and learning activities	Assessment tasks
1	Students will get an overview of concept and scope of public nutrition	Theory class	Class test
2	Students would get an in-depth knowledge of various national nutrition programmes to combat malnutrition	Lectures, power point presentations, and searching e-resources on programme updates	Short and long answer question
3	Students will get an insight into the methods of assessment of nutritional status and their significance	Lectures supported by demonstration of techniques of nutritional status assessment	Preparing and interpreting growth charts; class test
4	Students would gain an understanding of the importance of nutrition education in bringing about behaviour change. They would become familiar with the methods to reach out to the community.	Lectures, demonstration, discussion	Developing a nutrition education plan in order to communicate health and nutrition related messages.

***Assessment tasks listed here are indicative and may vary.**

**DSE-NHE-2: ENTREPRENEURSHIP FOR SMALL CATERING UNITS
(CREDITS: 6; THEORY 4, PRACTICAL 2)**

COURSE OBJECTIVES:

- To impart concepts of menu planning, purchasing, receiving, storage, food production, space and equipment.
- To develop concept of financial and personnel management.
- To enable students to develop project plan to open a food service unit.

COURSE LEARNING OUTCOMES: After completing this course, the learner will able to:

- Describe the origin and kinds of food service units.
- Discuss importance and types of menu and factors affecting menu planning.
- Understand basic principles of organization and management.
- Develop insight into food production process, highlighting areas like food purchase, storage, quantity food production, food service and food hygiene
- Explain the role of space, equipment, budget, costs and personnel in catering business
- Plan for a small food service unit.
- Conduct market survey of foods and food service units and develop checklist for good hygiene practices.
- Demonstrate skills in standardizing recipes and plan menus for packed meals, tiffins for school/ college canteen.

THEORY:

CONTENTS

PERIODS: 60 (4 credits)

UNIT I: Introduction to Food Service Units

4

- Origin of food service units
- Kinds of food service units

Sethi Mohini. (2016). *Institutional Food Management*. 2nd ed. Delhi. New Age International (P) Ltd. Chapter 1, pg 3-14.

UNIT II: Menu Planning

8

- Importance of menu
- Factors affecting menu planning
- Types of menu

Sethi Mohini. (2016). *Institutional Food Management*. 2nd ed. Delhi. New Age International (P) Ltd. Chapter 17, pg 264-291.

UNIT III: Organization and Management

6

- Principles of management
- Functions of manager

Sethi M, Malhan S. (2015). *Catering management: An integrated Approach*; 3rd ed. Delhi. New Age International (P) Ltd. Chapter 1, pg 3-21

UNIT IV: Food Production Process

14

- Food purchasing and receiving
- Storage
- Quantity food production -standardization of recipes, recipe adjustments and portion control, quantity food production techniques

- Food service
- Food hygiene and sanitation

UNIT V: Spaces, Equipment, Financial and Personnel Management

16

- Space -types of kitchen areas, flow of work and work area relationship
- Equipment- factors affecting selection of equipment
- Importance of financial management
- Budgets and budgeting process
- Cost concepts
- Functions of a personnel manager
- Job description and job specification

Sethi Mohini. (2016). *Institutional Food Management*. 2nd ed. Delhi. New Age International (P) Ltd. Chapter 6, 10, 21,22,25; pg 99-129, 166-176, 371-421, 467-476.

UNIT VI: Planning a Small Food Service Unit

12

- Preliminary planning, survey of types of units, identifying clientele, menu, operations and delivery
- Planning the set up-identifying resources, developing project plan, determining investments

IGNOU (2017) MFN 007 *Entrepreneurship and food service Management*, Delhi. Chapter 2-3, pg 45-85.

PRACTICAL:

PERIODS: 60 (2 credits)

- Market survey for food items both raw and processed.
- Survey of food service units.
- Standardization of a recipe.
- Preparing quick foods for scaling up for quantity productions.
- Planning menus for the following: packed meals for office employees, nutritious tiffins for school children, school/college canteen menus.
- Demonstration of a specialized cuisine.
- Develop a checklist for good hygiene practices.

COMPULSORY READINGS :

- IGNOU (2017) MFN 007 *Entrepreneurship and food service Management*, Delhi.
- Sethi M, Malhan S. (2015). *Catering management: An integrated Approach*; 3rd ed. Delhi. New Age International (P) Ltd.
- Sethi Mohini. (2016). *Institutional Food Management*. 2nd ed. Delhi. New Age International (P) Ltd.

ADDITIONAL RESOURCES:

- Roday S. (2003). *Food Hygiene & Sanitation*. Noida: Tata Mc Graw Hill Publication Ltd.
- Saxena R.P. (2010). *Food Service and Catering Management*. Delhi: Anmol Publications Pvt Ltd.
- Taneja S and Gupta S.L. (2001). *Entrepreneurship Development*. Delhi: Galgotia Publishing.

TEACHING LEARNING PROCESS:

- Lecture
- Use of prescribed textbooks and handouts
- Power point presentation
- Field visit
- Project based learning

ASSESSMENT METHODS:

As per University of Delhi norms

For each course the assessment is as follows:

For theory (maximum marks 100):

-End semester exam: 75 marks

-Internal Assessment: 25 marks (Class test- 10 marks; Assignment- 10 marks; Attendance- 5 marks)

For practical (maximum marks 50):

-End-semester practical exam: 25 marks

-Continuous evaluation of practicals on a predecided key: 25 marks

KEYWORDS:

- Department of Home Science
- Entrepreneurship
- Food service
- Menu planning

Facilitating the achievement of course learning objectives

Unit no.	Course learning outcomes	Teaching and learning activities	Assessment tasks
1	Students will get an overview of basic aspects of food service units	Theory class	Class test
2	Students would get an in-depth understanding of the various dimensions of menu planning	Lectures, power point presentations, discussion and visual representation	Applicable based short and long answer questions
3	Students will get an insight into the organizational and managerial aspects of running a food service unit	Discussions with examples	Test, mock exercises
4	Students would gain knowledge of the various processes involved in food production i.e purchase, storage, quantity production, food service and food hygiene	Theory classes, discussion, market survey	Class test, practical application of standardization of recipes, portion control etc.
5	Students will understand the role of space, equipment, budget, costs and personnel in catering management	Theory supplemented with case studies	Class test with short and long answer questions
6	Students will acquire skill in developing a plan for a small food service unit	Lecture, discussion	Preparation of plan to set up a home based catering unit complete in all respects

***Assessment tasks listed here are indicative and may vary.**

**DSE-NHE-3: THERAPEUTIC NUTRITION
(CREDITS: 6; THEORY 4, PRACTICAL 2)**

COURSE OBJECTIVES:

- To impart understanding regarding etiology, symptoms and nutritional management of some common ailments.
- To develop skills in planning and preparation of therapeutic diets.
- To inculcate skills to be able to perform market surveys.

COURSE LEARNING OUTCOMES: After completing this course the learner will be able to:

- Explain therapeutic adaptations of normal diet.
- Understand the etiology, symptoms and nutritional management of some common diseases.
- Explain etiology, assessment and management of weight imbalances and eating disorders.
- Describe risk factors, assessment, complications and dietary management of Diabetes, Hypertension , Atherosclerosis

- Demonstrate skills in modifying diets and planning therapeutic diets for various conditions.
- Conduct market survey of therapeutic foods.

THEORY:

CONTENTS

PERIODS: 60 (4 credits)

UNIT I: Principles of Nutrition Care

4

- Therapeutic adaptations of the normal diet
- Progressive diets- clear fluid, full fluid, soft and regular

Khanna K et al.(2013). *Textbook of nutrition and dietetics*; Delhi: Elite Publishing House (P) Ltd. Chapter 11, pg 165-172.

UNIT II: Infections and Fevers

12

Etiology, clinical features and nutritional management of infections and fever:

- Typhoid (acute fever)
- Tuberculosis (chronic fever)
- HIV

Khanna K et al.(2013). *Textbook of nutrition and dietetics*; Delhi: Elite Publishing House (P) Ltd. Chapter 12, pg 184-199

UNIT III: Diseases of the GI Tract

15

Etiology, clinical features and nutritional management of the following GI tract disorders:

- Diarrhoea
- Constipation
- Lactose Intolerance
- Celiac disease
- Infective Hepatitis (liver)

Khanna K et al.(2013). *Textbook of nutrition and dietetics*; Delhi: Elite Publishing House (P) Ltd. Chapter 14-15, pg 220-263.

UNIT IV: Weight Management and Eating Disorders

14

Etiology, clinical features and nutritional management of:

- Weight Imbalance- overweight and obesity; underweight
- Eating disorders-Anorexia nervosa and Bulimia.

Khanna K et al.(2013). *Textbook of nutrition and dietetics*; Delhi: Elite Publishing House (P) Ltd. Chapter 13, pg 200-218.

UNIT V: Non Communicable Diseases (NCDs)

15

Etiology, clinical features, basic diagnosis and nutritional management of:

- Diabetes Mellitus
- Metabolic Syndrome
- Hypertension
- Atherosclerosis.

Khanna K et al.(2013). *Textbook of nutrition and dietetics*; Delhi: Elite Publishing House (P) Ltd .Chapter 16-17, pg 277-336.

PRACTICALS

PERIODS: 60 (2 credits)

Planning, preparation and service of diets/dishes for the following:

- Therapeutic diets-normal, soft, clear and full fluid
- Fevers: acute and chronic
- Diarrhoea and Constipation
- Obesity
- Type 2 Diabetes

- Hypertension and Atherosclerosis
- Survey of Therapeutic foods in market

COMPULSORY READING:

- Khanna K et al.(2013). *Textbook of nutrition and dietetics*; Delhi: Elite Publishing House (P) Ltd.
- Longvah T et al (2017). *Indian food composition tables*. Hyderabad, Telangana: National Institute of Nutrition.
- Siddhu A, Bhatia N, Singh K, Gupta S (eds). (2017). *Lady Irwin College Technical series 6: Compilation of food exchange list*. Delhi: Global Books Organisation.
- Srilakshmi B.(2019). *Dietetics*. (8th ed). Delhi: New Age International (P) Ltd

ADDITIONAL RESOURCES:

- Agarwal A & Udipi SA.(2014). *Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd.
- Bamji MS, Rao NP, Reddy V.(2017). *Textbook of human nutrition*. (4th ed). Delhi: Oxford and IBH Publishing co. (P) Ltd.
- Indian Dietetic Association. (2018). *Clinical Dietetics Manual*. (2nd ed). Delhi: Elite Publishing House (P) Ltd.
- Mahan LK & Raymond JL.(2016). *Krause’s food and the nutrition care process*. (14th ed). Amsterdam: Elsevier.
- Mudambi SR & Rajagopal MV.(2012). *Fundamentals of food, nutrition and diet therapy*; (6th ed). Delhi: New Age International (P) Ltd.
- Staci Nix.(2017). *William’s Basic Nutrition and Diet Therapy*. (15th ed). Amsterdam: Elsevier.

TEACHING LEARNING PROCESS:

- Lecture
- Use of prescribed textbooks and handouts
- Power point presentation
- Practicum
- Market survey

ASSESSMENT METHODS:

As per University of Delhi norms

For each course the assessment is as follows:

For theory (maximum marks 100):

-End semester exam: 75 marks

-Internal Assessment: 25 marks (Class test- 10 marks; Assignment- 10 marks; Attendance- 5 marks)

For practical (maximum marks 50):

-End-semester practical exam: 25 marks

-Continuous evaluation of practicals on a predecided key: 25 marks

KEY-WORDS:

- Department of Home Science
- Therapeutic diets
- Dietary modification

Facilitating the achievement of course learning objectives

Unit no.	Course learning outcomes	Teaching and learning activities	Assessment tasks
1	Students will understand the need for adapting normal diets for therapeutic purposes	Theory class	Class test
2	Students would get an in-depth	Lectures, case studies	Modifying normal diet

	knowledge of the causation, clinical features and management of infections and fevers		in different kinds of fevers
3	Students will get an insight into the etiology, symptoms and medical nutrition therapy for GI tract disorders	Theory, discussion and power point presentation	Preparing diets and dishes for disease conditions, objective and subjective test
4	Students would gain an understanding of various issues related to body weight, their implications and management	Lecture, power point presentation, discussion	Developing a plan to bring about weight loss
5	Students will gain knowledge of the dangers of non-communicable diseases and understand ways and means to prevent their occurrence	Theory class supplemented with case studies, searching e-resources for latest guidelines	Case study of a person suffering from NCDs and suggesting solutions; short and long answer questions

***Assessment tasks listed here are indicative and may vary.**

SEC-NHE1: HOME BASED CATERING (CREDITS:4 ;THEORY:4)

COURSE OBJECTIVES:

- To impart concepts of menu planning, purchasing, receiving, storage, food production, space and equipment.
- To develop concept regarding management of resources.
- To develop skill to plan and set up a small food service unit

COURSE LEARNING OUTCOMES: After completing this course the learner will be able to:

- List the various factors contributing to growth of food service industry.
- Know the kinds of food service establishments.
- Describe the various aspects of food production, including menu planning, food purchase, storage and quantity food production.
- Develop understanding of standardization of recipe.
- Describe the importance of hygiene and sanitation in a food service unit.
- Understand various resources and their optimum utilization.
- Plan for a small food service unit, keeping basic principles in mind.

THEORY:

CONTENTS

PERIODS: 60 (4 credits)

UNIT I: Introduction to Food Service

8

- Factors contributing to the growth of food service industry
- Kinds of food service establishments
- Recent trends in food service industry

Sethi M.(2016). *Institutional food management*. (2nd ed). Delhi: New Age International (P) Ltd. Chapter 1,33; pg 3-14, 589-597

UNIT II: Food Production

20

- Menu planning: importance of menu, factors affecting menu planning, menu planning for different kinds of food service units/ types of menus
 - Food purchase and storage
 - Quantity food production: food production system and process, methods of cooking, standardization of recipes and portion control
 - Food service
 - Hygiene and sanitation-environmental hygiene, hygiene in food handling, personnel hygiene
- Sethi M, Malhan S. (2015). *Catering management: An integrated Approach*; 3rd ed. Delhi. New Age International (P) Ltd. Chapter 13-17, 28; pg 181-262, 395-411.

UNIT III: Resources

20

- Finances- cost concepts, factors responsible for losses, guidelines for controlling food costs.
 - Manpower- staff scheduling, recruitment, selection, training
 - Equipment- selection, purchasing methods, maintenance
- Sethi M, Malhan S. (2015). *Catering management: An integrated Approach*; 3rd ed. Delhi. New Age International (P) Ltd. Chapter 20-21,25,27, 8, 10-11; pg 280-292, 363-373, 383-389, 126-136,143-152.

UNIT IV: Planning of a Food Service Unit

12

- Preliminary planning -principles of management, phases of planning
- Planning the set up- identifying the clientele, market survey, developing project plan, determining investments, responsibilities of manager
- IGNOU (2017) MFN 007 *Entrepreneurship and food service Management*, Delhi. Chapter 2-3, pg 45-85.

COMPULSORY READING:

- IGNOU (2017) MFN 007 *Entrepreneurship and food service Management*, Delhi.
- Sethi M.(2016). *Institutional food management*. (2nd ed). Delhi: New Age International (P) Ltd.
- Sethi M & Malhan S.(2015). *Catering management: an integrated approach*. (3rd ed). Delhi: New Age International (P) Ltd

ADDITIONAL RESOURCES:

- Roday S. (2003). *Food Hygiene & Sanitation*. Noida: Tata Mc Graw Hill Publication Ltd.
- Saxena R.P. (2010). *Food Service and Catering Management*. Delhi: Anmol Publications Pvt Ltd.

TEACHING LEARNING PROCESS:

- Lecture
- Use of prescribed textbooks and handouts
- Power point presentation

ASSESSMENT METHODS:

As per University of Delhi norms.

For each course the assessment is as follows:

For theory (maximum marks 100):

-End semester exam: 75 marks

-Internal Assessment: 25 marks (Class test- 10 marks; Assignment- 10 marks; Attendance- 5 marks)

KEYWORDS:

- Department of Home Science
- Entrepreneurship
- Food service
- Menu planning

Facilitating the achievement of course learning objectives

Unit no.	Course learning outcomes	Teaching and learning activities	Assessment tasks
1	Students will get an overview of basic aspects of food service units	Theory class	Class test
2	Students would get an in-depth understanding of the various dimensions of menu planning and processes involved in food production and food hygiene	Lectures, power point presentations, discussion and visual representation	Preparing different types of menus, class test
3	Students will understand the role of equipment, budget, costs and personnel in catering management	Theory supplemented with case studies	Test, mock exercises
4	Students will acquire skill in developing a plan for a small food service unit	Lecture, discussion	Preparation of plan to set up a home based catering unit complete in all respects

*Assessment tasks listed here are indicative and may vary.

SEC-NHE-2: NUTRITION AND FITNESS (CREDITS: 4; THEORY: 4)

COURSE OBJECTIVES:

- To provide students the basic knowledge of nutritional supplements.
- To explain the significance of fitness and sports in maintaining health.
- To explain the importance and types of physical activity.

COURSE LEARNING OUTCOMES: After completing this course the learner will be able to:

- Understand the concept of fitness and basic terminologies related to it.
- Describe the basic nutritional guidelines/ recommendations for fitness and sports.
- List the basic categories of nutritional supplements.
- Explain the importance and benefits of physical activity.
- Classify physical activities based on frequency, intensity, and type.
- Assess the etiology and health implications of overweight and obesity.
- Prepare a diet and weight management plan.

THEORY:

CONTENT

PERIODS: 60 (4 credits)

UNIT I: Understanding Fitness

14

- Definition of fitness, health and related terms
- Assessment of fitness
- Approaches for keeping fit

Williams MH.(2007). *Nutrition for health, fitness and sport*. (8th ed). New York, NY: McGraw Hill. Chapter 1, pg 4-13

Chadha R & Mathur P (eds).(2015). *Nutrition: a lifecycle approach*. Delhi: Orient Blackswan. Chapter 25, pg 365-368

UNIT II: Importance of Nutrition

16

- Role of nutrition in fitness
- Nutritional guidelines for health and fitness
- Nutritional supplements

- Dietary recommendations for sports.
- Ergogenic aids.

Williams MH.(2007). *Nutrition for health, fitness and sport*. (8th ed). New York, NY: McGraw Hill. Chapter 1,2, pg 17-21, 49-54.

Chadha R & Mathur P (eds).(2015). *Nutrition: a lifecycle approach*. Delhi: Orient Blackswan. Chapter 25, pg 371-378

UNIT III: Importance of Physical Activity

14

- Importance and benefits of physical activity
- Physical activity- frequency, intensity, time and type with examples
- Physical activity guidelines and physical activity pyramid.
- Physical activity and exercise through the lifespan.

Williams MH.(2007). *Nutrition for health, fitness and sport*. (8th ed). New York, NY: McGraw Hill. Chapter 1, pg 8-9

Chadha R & Mathur P (eds).(2015). *Nutrition: a lifecycle approach*. Delhi: Orient Blackswan. Chapter 25, pg 368-369

UNIT IV: Weight Management

16

- Assessment, etiology, health complications of overweight and obesity
- Diet and exercise for weight management
- Fad diets
- Principles of planning weight reducing diets

Khanna K et al.(2013). *Textbook of nutrition and dietetics*; Delhi: Elite Publishing House (P) Ltd .Chapter 13, pg 200-219.

Williams MH.(2007). *Nutrition for health, fitness and sport*. (8th ed). New York, NY: McGraw Hill. Chapter 11 pg 406-409,417-420, 428-429.

COMPULSORY READING:

- Agarwal A & Udipi SA.(2014). *Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd.
- Chadha R & Mathur P (eds).(2015). *Nutrition: a lifecycle approach*. Delhi: Orient Blackswan.
- Khanna K et al.(2013). *Textbook of nutrition and dietetics*; Delhi: Elite Publishing House (P) Ltd .
- Srilakshmi B, Sugathi V, Ashok KC.(2017). *Exercise physiology, fitness and sports nutrition*. Delhi: New Age International (P) Ltd.

ADDITIONAL RESOURCES:

- Williams MH.(2017). *Nutrition for health, fitness and sport*. (11th ed). New York, NY: McGraw Hill

TEACHING LEARNING PROCESS:

- Power point presentations
- Lectures
- Use of prescribed textbooks and handouts
- Experimental learning

ASSESSMENT METHODS:

As per University of Delhi norms

For each course the assessment is as follows:

For theory (maximum marks 100):

-End semester exam: 75 marks

-Internal Assessment: 25 marks (Class test- 10 marks; Assignment- 10 marks; Attendance- 5 marks)

KEYWORDS:

- Obesity
- Weight management
- Fad diets
- Department of Home Science

Facilitating the achievement of course learning objectives

Unit no.	Course learning outcomes	Teaching and learning activities	Assessment tasks
1	Students will get an overview of various aspects of fitness	Theory class	Class test
2	Students would get an in-depth knowledge of role of nutrition in attaining fitness	Lectures, power point presentations, discussion	Applicable based objective and long answer question
3	Students will get an insight into the different dimensions of physical activity and its relevance in maintaining good health	Discussions	Preparing practical guidelines to create awareness about physical activity
4	Students would gain an understanding of various issues related to body weight, their implications and management	Lectures, visual presentation, discussion	Developing a weight loss plan

***Assessment tasks listed here are indicative and may vary.**

SEC-NHE-3: BAKERY SCIENCE (CREDITS: 4; THEORY:2, PRACTICAL:2)

COURSE OBJECTIVES:

- To impart knowledge related to baking technology.
- To introduce students to the techniques and skills of baking cakes, biscuits, bread, buns, pizza base and pastry.

COURSE LEARNING OUTCOMES: After completion of the course the learner will be able to:

- Understand the significance of ingredients, processes and product characteristics in bakery.
- Demonstrate skill in preparation of cream and sponge cakes, short crust pastry, bread, buns, dinner rolls, pizza base, biscuits and cookies.
- Know about bakery equipment, their selection and maintenance.

THEORY:

CONTENTS

PERIODS: 30 (2 credits)

UNIT I: Basic Concepts of Bakery

22

Ingredients and processes used for preparation of -

- Cream cakes and sponge cakes
- Short crust pastry
- Breads, buns and pizza base
- Cookies and biscuits

Yogambal AK.(2012). *Textbook of baking and confectionery*.(2nded).Delhi: PHI. Chapter 1,12,14-15; pg 1- 13, 77-98, 111-127

UNIT II: Bakery Process and Equipment

8

- Product characteristics, common bakery faults and corrective measures
- Bakery equipment- types, selection, operations and maintenance

PRACTICAL:

PERIODS: 60 (2 credits)

Practical training in baking of:

- Cream cake
- Sponge cake preparations
- Short crust pastry
- Breads, buns, dinner rolls and pizza base
- Biscuits and cookies

COMPULSORY READING:

- Dubey S.C(2007) *Basic Baking- Science and Craft*. Society of Indian Bakers, Delhi.
- Kingslee John J.(2019). *Professional textbook to bakery and confectionery*. (2nded). Delhi: New Age International (P) Ltd
- Raina U et al.(2010). *Basic food preparation-a complete manual*. (4thed). Delhi: Orient Blackswan
- Yogambal AK.(2012). *Textbook of baking and confectionery*.(2nded).Delhi: PHI

ADDITIONAL RESOURCES:

- Matz .A. (1998) *Bakery Technology and Engineering*, Delhi, CBS Publishers.

TEACHING LEARNING PROCESS:

- Lectures
- Power point presentations
- Use of prescribed textbooks and demonstrations
- Practicum

ASSESSMENT METHODS:

As per University of Delhi norms.

For each course the assessment is as follows:

For theory (maximum marks 50):

-End semester exam: 50 marks

For practical (maximum marks 50): Continuous evaluation.

KEY WORDS:

- Department of Home Science
- Baked products
- Bakery equipment

Facilitating the achievement of course learning objectives

Unit no.	Course learning outcomes	Teaching and learning activities	Assessment tasks
1	Students will get an in-depth knowledge of the principles and processes in bakery and ingredients used in various baked products	Theory class supplemented with detailed examples	Demonstrate skill in baking
2	Students would get an overview of the various characteristics of baked products, bakery equipment and related issues	Lectures, discussion	Applicable based objective and long answer question

***Assessment tasks listed here are indicative and may vary.**

(CREDITS: 4; THEORY:4)

COURSE OBJECTIVES:

- To impart knowledge of principles underlying maternal and child nutrition and its impact.
- To develop understanding of Infant and Young Child Feeding (IYCF) guidelines.

COURSE LEARNING OUTCOMES: After completing this course the learner will be able to:

- State the nutritional requirements during pregnancy.
- Understand the common disorders during pregnancy and other issues relating to maternal health.
- Describe the nutritional needs of nursing mothers and infants
- Explain the biology and importance of breastfeeding and the implications of low birth weight.
- Explain Infant and Young Child Feeding (IYCF) guidelines.
- Identify and assess malnutrition in infants and children.
- Interpret various statistics related to child health and infant mortality.

THEORY:

CONTENTS:

PERIODS: 60 (4 Credits)

UNIT I: Pregnancy

16

- Nutritional needs during pregnancy, common disorders of pregnancy (anaemia, HIV infection, pregnancy induced hypertension), relationship between maternal diet and birth outcome.
- Maternal health and nutritional status, maternal mortality and issues relating to maternal health.

Chadha R & Mathur P (eds).(2015). *Nutrition: a lifecycle approach*: Delhi. Orient Blackswan. Chapter 18, pg 271-291

UNIT II: Lactation

14

- Nutritional needs of nursing mothers and infants, determinants of birth weight and consequences of low birth weight
- Breastfeeding biology, breastfeeding support and counseling

Chadha R & Mathur P (eds).(2015). *Nutrition: a lifecycle approach*: Delhi. Orient Blackswan. Chapter 19, pg 292-301

UNIT III: Infancy

16

- Infant and young child feeding and care – current feeding practices and nutritional concerns, guidelines for infant and young child feeding- breast feeding, weaning and complementary feeding.
- Assessment and management of moderate and severe malnutrition among children, micro- nutrient malnutrition among preschool children.
- Child health and morbidity, neonatal, infant and child mortality, IMR and U5MR; link between mortality and malnutrition.

Agarwal A & Udipi SA.(2014). *Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd. Chapter 11, pg 387-406

Park K.(2015). *Textbook of preventive and social medicine*. (23rded). Jabalpur, MP: Banarsidas Bhanot Publishers. Chapter 10, pg 638-644.

UNIT IV: National Programmes

14

Overview of maternal and child nutrition policies and programmes.

Khanna K et al.(2013). *Textbook of nutrition and dietetics*; Delhi: Elite Publishing House (P) Ltd. Chapter 7.2, pg 301-320

COMPULSORY READING:

- Agarwal A & Udipi SA.(2014). *Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd.
- Bamji MS, Rao NP, Reddy V.(2017). *Textbook of human nutrition*. (4th ed). Delhi: Oxford and IBH Publishing co. (P) Ltd.
- Chadha R & Mathur P (eds).(2015). *Nutrition: a lifecycle approach*: Delhi. Orient Blackswan.

ADDITIONAL RESOURCES:

- Ghosh S.(1997). *Nutrition and child care- a practical guide*. Delhi: Jaypee Brothers (P) Ltd.
- Khanna K et al.(2013). *Textbook of nutrition and dietetics*; Delhi: Elite Publishing House (P) Ltd.
- Mudambi SR & Rajagopal MV.(2012). *Fundamentals of food, nutrition and diet therapy*; (6th ed). Delhi: New Age International (P) Ltd.
- Park K.(2015). *Textbook of preventive and social medicine*. (23rded). Jabalpur, MP: Banarsidas Bhanot Publishers.
- Singh N.(2015) *Our kids eat everything*. Delhi: Hachette.
- Wardlaw GM, Hampl JS.(2019). *Perspectives in nutrition*. (11th ed). New York, NY: McGraw Hill.

TEACHING LEARNING PROCESS:

- Lectures
- Power point presentations
- Use of prescribed textbooks and demonstrations

ASSESSMENT METHODS:

As per University of Delhi norms

For each course the assessment is as follows:

For theory (maximum marks 100):

-End semester exam: 75 marks

-Internal Assessment: 25 marks (Class test- 10 marks; Assignment- 10 marks; Attendance- 5 marks)

KEY WORDS:

- Department of Home Science
- Child nutrition
- Maternal
- Complementary feeding

Facilitating the achievement of course learning objectives

Unit no.	Course learning outcomes	Teaching and learning activities	Assessment tasks
1	Students would gain knowledge about the physiological considerations and nutritional needs during pregnancy as well as other issues relating to maternal health	Lectures and discussions	Class test with short and long answer questions
2	Students would gain an understanding of nutritional needs during lactation as well as issues related to breastfeeding	Theory class	Preparing nutrition education messages for lactating mothers
3	Students would get an overview of the development pattern and nutritional needs during childhood as well as malnutrition states and related statistics.	Theory class, power point presentation, discussion	Class test with application based questions

4	Students will become aware of government efforts to ensure maternal and child health	Lecture and searching e-resources for updates national programmes	Planning sample dishes for supplementary nutrition and nutrition education
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***Assessment tasks listed here are indicative and may vary.**

SEC- NHE- 5: FOOD AND NUTRITION (CREDITS: 4; THEORY:2, PRACTICAL:2)

COURSE OBJECTIVES:

- To develop professional skills in the field of food and nutrition.
- To impart skill to assess nutritional status.
- To make students capable of interpreting food labels

COURSE LEARNING OUTCOMES: After completing this course the learner will be able to:

- List food sources of various nutrients
- Assess diet of self using 24 hour dietary recall method
- Demonstrate skill in planning and preparing balanced meal plans for different age and income groups using food exchange system
- Demonstrate skill in preparing nutritious snacks using various methods of cooking
- Prepare Nutrition Labels for food products
- Interpret data relating to body mass index (BMI)

THEORY:

CONTENTS

PERIODS: 30 (2 credits)

UNIT I: Meal Planning

20

- Identification of food sources for various nutrients
- Introduction to meal planning, concept of food exchange system.
- Composition of balanced diet for all age groups

Chadha R & Mathur P (eds).(2015). *Nutrition: a lifecycle approach*: Delhi, Orient Blackswan. Chapter 15, pg 223-236

UNIT II: Nutritional Status

10

- Assessment of nutritional status
- Understanding food labels for better nutrition

Khanna K et al.(2013). *Textbook of nutrition and dietetics*; Delhi: Elite Publishing House (P) Ltd.Chapter 5.1 pg 165-189

Chadha R & Mathur P (eds).(2015). *Nutrition: a life cycle approach*.Delhi: Orient Blackswan. Chapters 14, pg 204-219

PRACTICAL:

PERIODS: 60 (2 credits)

- Record diet of self-using 24 hour dietary recall and its nutritional analysis.
- Planning of meals for adults of different activity levels for various income groups.Planning of nutritious snacks for different age and income groups.
- Preparation of nutritious snacks using various methods of cooking.
- Estimation of BMI and other nutritional status parameters.
- Evaluation of food labels.

COMPULSORY READING:

- Agarwal A & Udipi SA.(2014). *Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd.
- Chadha R & Mathur P (eds).(2015). *Nutrition: a lifecycle approach*: Delhi, Orient Blackswan.
- Khanna K et al.(2013). *Textbook of nutrition and dietetics*; Delhi: Elite Publishing House (P) Ltd.

ADDITIONAL RESOURCES:

- Longvah T et al (2017). *Indian food composition tables*. Hyderabad, Telangana: National Institute of Nutrition.
- Siddhu A, Bhatia N, Singh K, Gupta S (eds). (2017). *Lady Irwin College Technical series 6: Compilation of food exchange list*. Delhi: Global Books Organisation.

TEACHING LEARNING PROCESS:

- Lectures
- Power point presentations
- Use of prescribed textbooks and demonstrations
- Practicum

ASSESSMENT METHODS:

As per University of Delhi norms

As per University of Delhi norms.

For each course the assessment is as follows:

For theory (maximum marks 50):

-End semester exam: 50 marks

For practical (maximum marks 50): Continuous evaluation.

KEY WORDS:

- Department of Home Science
- Nutrition labeling
- Dietary recall
- Meal planning

Facilitating the achievement of course learning objectives

Unit no.	Course learning outcomes	Teaching and learning activities	Assessment tasks
1	Students would have understood basics of meal planning and use of appropriate foods for the same	Correlating theory and use of exchange lists and food composition tables to plan balanced diets	Planning full days' diets and snacks for different age groups
2	Students would get an overview of the various methods of assessment of nutritional status. They would also learn how to interpret food labels	Lectures with examples, demonstration	Practical use of tools for nutritional status assessment

***Assessment tasks listed here are indicative and may vary.**

**GE-NHE-1: HUMAN NUTRITION
(CREDITS:6; THEORY 4, PRACTICAL 2)**

COURSE OBJECTIVES:

- To familiarize students with fundamentals of food, nutrition and their relationship to health.
- To impart knowledge and develop skills regarding planning healthy diets for all age groups.

COURSE LEARNING OUTCOMES: After completing this course the learner will be able to:

- Explain the importance and structure of food groups and understand the relationship between nutritional health and food selection.
- Explain functions of specific nutrients in maintaining health.
- Identify good sources of various nutrients.
- Know the effects of deficiency and excess of various nutrients.
- Explain rationale for nutrient intake recommendations across life cycle.
- Use food exchange list method for planning balanced diets.
- Plan balanced diets and nutritious snacks for various stages of life.

THEORY:

CONTENTS

PERIODS: 60 (4 credits)

UNIT I: Basic Concepts in Nutrition

10

- Basic terms used in nutrition
- Understanding relationship between food, nutrition and health
- Functions of food- physiological, psychological and social
- Food groups and concept of a balanced diet

Rekhi T &Yadav H.(2015). *Fundamentals of food and nutrition*. Delhi: Elite Publishing House (P) Ltd.

Chapter 1, pg 3-11

Chadha R & Mathur P (eds).(2015). *Nutrition: a life cycle approach*.Delhi: Orient Blackswan. Chapters 15, pg 223-228

UNIT II: Nutrients

25

- Energy- components of energy expenditure, sources, concept of energy balance
- Functions, dietary sources, effects of deficiency and/or excess on health of the following nutrients:
 - Carbohydrate including dietary fibre
 - Fat
 - Protein
 - Fat soluble vitamins A, D, E, K
 - Water soluble vitamins- thiamine, riboflavin, niacin, folic acid, vitamin B₁₂, vitamin C
 - Minerals- calcium, iron, iodine, zinc

Rekhi T &Yadav H.(2015). *Fundamentals of food and nutrition*. Delhi: Elite Publishing House (P) Ltd.

Chapters 11-16, pg 125-248

UNIT III: Nutrition during Lifecycle

25

Physiological considerations, nutritional needs, feeding pattern and nutritional concerns for the following:

- Adult man/woman
- Pregnant woman
- Lactating woman and infant
- Elderly
- Preschool and school going child
- Adolescent

Khanna K et al.(2013). *Textbook of nutrition and dietetics*; Delhi: Elite Publishing House (P) Ltd. Chapter 5-9, pg 47-156.

PRACTICALS:

PERIODS: 60 (2 credits)

- Identifying rich sources of nutrients
- Using food exchange lists for planning nutritious diets/ snacks for various age groups

COMPULSORY READING:

- Khanna K et al.(2013). *Textbook of nutrition and dietetics*; Delhi: Elite Publishing House (P) Ltd.
- Longvah T et al (2017). *Indian food composition tables*. Hyderabad, Telangana: National Institute of Nutrition.
- Sethi P& Lakra P (2015). *Aahar vigyan, poshan evam suraksha (Hindi)*. Delhi: Elite Publishing House (P) Ltd.
- Siddhu A, Bhatia N, Singh K, Gupta S (eds). (2017). *Lady Irwin College Technical series 6: Compilation of food exchange list*. Delhi: Global Books Organisation.

ADDITIONAL RESOURCES:

- Agarwal A & Udipi SA.(2014). *Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd.
- Bamji MS, Rao NP, Reddy V.(2017). *Textbook of human nutrition*. (4th ed). Delhi: Oxford and IBH Publishing co. (P) Ltd.
- Chadha R & Mathur P (eds).(2015). *Nutrition: a lifecycle approach*. Delhi: Orient Blackswan.
- Rekhi T & Yadav H.(2015). *Fundamentals of food and nutrition*. Delhi: Elite Publishing House (P) Ltd.
- Srilakshmi B.(2018). *Nutrition science*. (6th ed). Delhi: New Age International (P) Ltd.
- Wardlaw GM, Hampl JS.(2019). *Perspectives in nutrition*. (11th ed). New York, NY: McGraw Hill.

TEACHING LEARNING PROCESS:

- Lectures
- Use of prescribed textbooks
- Power point presentations
- Practicum

ASSESSMENT METHODS:

As per University of Delhi norms

For each course the assessment is as follows:

For theory (maximum marks 100):

-End semester exam: 75 marks

-Internal Assessment: 25 marks (Class test- 10 marks; Assignment- 10 marks; Attendance- 5 marks)

For practical (maximum marks 50):

-End-semester practical exam: 25 marks

-Continuous evaluation of practicals on a predecided key: 25 marks

KEYWORDS:

- Department of Home Science
- Nutrients
- Nutritional requirements

Facilitating the achievement of course learning objectives

Unit no.	Course learning outcomes	Teaching and learning activities	Assessment tasks
1	Students would understand key concepts in the study of food and nutrition	Interactive lectures on concepts related to food, nutrition and health	Class test
2	Students would have gained knowledge of nutrients, their sources and deficiency states	Theory classes on the functions of nutrients and other concepts, pictorial representation of food sources, deficiency symptoms	Objective questions on various concepts related to nutrients
3	Students would gain knowledge about the physiological considerations, nutritional needs and concerns during different	Lectures and discussions	Planning full days' diets and snacks for different age groups

age groups		
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*Assessment tasks listed here are indicative and may vary.

GE-NHE-2: NUTRITION: A LIFE SPAN APPROACH (CREDITS: 6; THEORY 4, PRACTICAL 2)

COURSE OBJECTIVES:

- To introduce students to the basic concepts of meal planning.
- To equip them with knowledge of physiological changes, nutritional concerns and healthy food choices during the life cycle.

LEARNING OUTCOMES: After completing this course the learner will be able to:

- Describe food groups, food pyramid and the concept of a balanced diet.
- Understand the importance of food exchange list and use them for meal planning
- Understand the factors effecting meal planning.
- Know the features of dietary guidelines for Indians and the relevance of the same.
- Explain the physiological changes, nutritional guidelines, healthy food habits and health concerns during adulthood and old age.
- Understand the physiological changes, nutritional needs during pregnancy and lactation.
- Know factors affecting pregnancy outcomes and nutritional problems during pregnancy.
- Describe growth and development, nutritional guidelines and nutritional concerns during infancy, preschool years, school age and adolescence.
- Plan and prepare balanced meals and nutritious snacks for various age groups.

THEORY:

CONTENTS

PERIODS: 60 (4 credits)

UNIT I: Principles of Meal Planning

15

- Balanced diet
- Food groups
- Food exchange list
- Factors effecting meal planning and food related behaviour
- Dietary guidelines for Indians and food pyramid

Chadha R & Mathur P (eds).(2015). *Nutrition: a lifecycle approach*. Delhi: Orient Blackswan. Chapter 15,16, pg 223-251.

UNIT II: Nutrition for Adulthood and Old Age

15

- Adult: Nutrient requirements for adult man and woman, nutritional guidelines, nutritional concerns, diet and lifestyle related diseases and their prevention
- Elderly – Physiological changes in elderly, RDA, nutritional guidelines, nutritional and health concerns in old age and their management, factors contributing to longevity

Chadha R & Mathur P (eds).(2015). *Nutrition: a lifecycle approach*. Delhi: Orient Blackswan. Chapter 17, 24, pg 252-270,355-364.

UNIT III: Nutrition during Pregnancy and Lactation

15

- Pregnancy – Physiological changes in pregnancy ,RDA, nutritional guidelines, nutritional needs, effect of nutritional status on pregnancy outcome, optimal weight gain and its components, nutrition related problems in pregnancy and ways to control them.
- Lactation – Physiology of lactation, RDA and nutritional needs of a nursing mother, nutritional

guidelines

Chadha R & Mathur P (eds).(2015). *Nutrition: a lifecycle approach*. Delhi: Orient Blackswan. Chapter 18,19, pg 271-301.

Agarwal A & Udipi SA.(2014).*Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd. Chapter 11, pg 369-386.

UNIT IV: Nutrition during Childhood

15

Growth and development, growth reference/standards, RDA, nutritional guidelines, nutritional concerns and healthy food choices

- Infants
- Preschool children
- School going children
- Adolescents

Chadha R & Mathur P (eds).(2015). *Nutrition: a lifecycle approach*. Delhi: Orient Blackswan. Chapter 20-23, pg 302-354.

PRACTICAL:

PERIODS: 60 (2 credits)

-Use of food exchange lists for planning and preparation of diets and dishes for:

- Young adult
- Pregnant and lactating woman
- Preschool child
- School age child and adolescents
- Elderly

-Planning complementary foods for Infants

COMPULSORY READING:

- Chadha R, Mathur P (eds).(2015) *Nutrition: A Life cycle Approach*; Delhi: Orient BlackSwan
- Khanna K et al.(2013) *Textbook of Nutrition and Dietetics*; Delhi: Elite Publishing House (P) Ltd
- Longvah T et al (2017). *Indian food composition tables* .Hyderabad, Telangana: National Institute of Nutrition.
- Siddhu A, Bhatia N, Singh K, Gupta S (eds). (2017). *Lady Irwin College Technical series 6: Compilation of food exchange list*. Delhi: Global Books Organisation.

ADDITIONAL RESOURCES:

- Agarwal A & Udipi SA.(2014).*Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd.
- Edelman S, Sharlin J (eds). (2009). *Life cycle nutrition- an evidence based approach*. Burlington, MA: Jones and Barlett Publishers
- Srilakshmi B.(2018). *Nutrition science*.(6thed). Delhi: New Age International (P) Ltd.
- Wardlaw G M, Hampl JS.(2019). *Perspectives in nutrition*. (11thed). New York, NY: McGraw Hill

TEACHING LEARNING PROCESS:

- Lectures
- Use of prescribed textbooks and handouts
- Power point presentations
- Practicum

ASSESSMENT METHODS:

As per University of Delhi norms

For each course the assessment is as follows:

For theory (maximum marks 100):

- End semester exam: 75 marks
- Internal Assessment: 25 marks (Class test- 10 marks; Assignment- 10 marks; Attendance- 5 marks)
- For practical (maximum marks 50):
- End-semester practical exam: 25 marks
- Continuous evaluation of practicals on a predecided key: 25 marks

KEYWORDS:

- Department of Home Science
- Balanced diet
- Food exchange list
- RDA
- Physiological changes

Facilitating the achievement of course learning objectives

Unit no.	Course learning outcomes	Teaching and learning activities	Assessment tasks
1	Students would have understood basics of meal planning and guidelines for the same	Correlating theory and use of exchange lists and food composition tables to plan balanced diets	Planning full days' diets and snacks for different age groups
2	Students would gain knowledge about the physiological considerations and nutritional needs of adults and elderly as well as ways to meet those needs	Lectures and discussions	Class test with short and long answer questions
3	Students would develop an understanding about the physiological considerations, nutritional needs and related issues during pregnancy and lactation	Lectures and discussions	Class test with short and long answer questions
4	Students would get an overview of the development pattern and nutritional needs during childhood as well as ways to meet those needs	Theory class, power point presentation, discussion	Developing healthy food choices for infants and children

***Assessment tasks listed here are indicative and may vary.**

**GE-NHE-3: CURRENT CONCERNS IN PUBLIC HEALTH NUTRITION
(CREDITS: 6; THEORY 4, PRACTICAL 2)**

COURSE OBJECTIVES:

- To enable students to identify and contribute to the prevention of under-nutrition and non-communicable diseases prevalent in the population.
- To create understanding of measures that can be taken to improve health and nutritional status of the population and national efforts towards the same.

COURSE LEARNING OUTCOMES: After completing this course the learner will be able to:

- Identify the causes and clinical features of various states of malnutrition and understand strategies for their treatment and prevention.
- Describe the risk factors, symptoms and management strategies for obesity, coronary heart disease and diabetes.
- Understand various strategies for combating malnutrition in communities.

- Explain the various national programmes to overcome malnutrition.
- Understand the concept of food and nutrition security and explain various technologies for improving food and nutrition security.
- Know about the different Public Sector programmes aimed at improving food and nutrition security.
- Develop nutritious recipes useful in treating malnutrition.

THEORY:

CONTENTS

PERIODS: 60 (4 credits)

UNIT I: Nutritional Problems Affecting the Community

25

Etiology, clinical features and management of:

- Under-nutrition
 - Protein Energy Malnutrition (PEM)
 - Iron Deficiency Anemia (IDA)
 - Vitamin A Deficiency (VAD)
 - Iodine Deficiency Disorders (IDD)
- Lifestyle related disorders
 - Overweight and obesity
 - Diabetes Mellitus
 - Coronary Heart Disease

- Fluorosis

Agarwal A & Udipi SA.(2014). *Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd. Chapter 12, pg 426-478..

Khanna K et al.(2013). *Textbook of nutrition and dietetics*; Delhi: Elite Publishing House (P) Ltd.Chapter 16, pg 277-292.

Bamji MS, Rao NP, Reddy V.(2017). *Textbook of human nutrition*. (4th ed). Delhi: Oxford and IBH Publishing co. (P) Ltd.Chapter 30, pg 445-461.

UNIT II: National Nutrition Programmes

15

- National Nutrition Mission
- Integrated Child Development Services (ICDS)
- National Programmes for prevention of anemia, vitamin A Deficiency and iodine deficiency disorders
IGNOU.(2017). MFN006, *Public Nutrition*, Delhi. Unit 10, pg 203-215
Programme Evaluation Organization, Planning Commission, GOI, (March 2011), *Evaluation study on ICDS, Vol I*, New Delhi. Pg 1-16
Niti Ayog, GOI (2017) *Nourishing India – National Nutrition Strategy*. New Delhi. Chapters 3-6, pg 24-38

UNIT III: Food and Nutrition Security

20

- Concept, challenges, pillars and technologies to improve food and nutrition security
- Overview of Public Sector programmes for improving food and nutrition security
- Strategies for improving nutrition and health status of the community-inputs involving food, health and education

Agarwal A & Udipi SA.(2014). *Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd. Chapter 13, pg 488-520

IGNOU.(2017). MFN006, *Public Nutrition*, Delhi. Unit 12,13; pg 250-284,

PRACTICALS:

PERIODS: 60 (2 credits)

- Planning of low cost nutritious recipes for preventing nutritional deficiencies
- Planning of low calorie nutritious recipes for weight management and diabetes.

COMPULSORY READING:

- Agarwal A & Udipi SA.(2014). *Textbook of human nutrition*. Delhi: Jaypee Brothers (P) Ltd.
- IGNOU.(2017). MFN006, *Public Nutrition*, Delhi.
- Khanna K et al.(2013). *Textbook of nutrition and dietetics*; Delhi: Elite Publishing House (P) Ltd.
- Longvah T et al (2017). *Indian food composition tables*. Hyderabad, Telangana: National Institute of Nutrition.

ADDITIONAL RESOURCES:

- Bamji MS, Rao NP, Reddy V.(2017). *Textbook of human nutrition*. (4th ed). Delhi: Oxford and IBH Publishing co. (P) Ltd.
- Niti Ayog, GOI (2017) *Nourishing India – National Nutrition Strategy*. New Delhi.
- Programme Evaluation Organization, Planning Commission, GOI, (March 2011), *Evaluation study on ICDS, Vol I*, New Delhi. Pg 1-16
- Raina U et al.(2010). *Basic food preparation-a complete manual*. (4th ed). Delhi: Orient Blackswan.
- Sethi P& Lakra P (2015). *Aahar vigyan, poshan evam suraksha (Hindi)*. Delhi: Elite Publishing House (P) Ltd.
- Srilakshmi B.(2019). *Dietetics*. (8th ed). Delhi: New Age International (P) Ltd.

TEACHING LEARNING PROCESS:

- Lectures
- Use of prescribed textbooks and handouts
- Power point presentations
- Practicum

ASSESSMENT METHODS:

As per University of Delhi norms

For each course the assessment is as follows:

For theory (maximum marks 100):

-End semester exam: 75 marks

-Internal Assessment: 25 marks (Class test- 10 marks; Assignment- 10 marks; Attendance- 5 marks)

For practical (maximum marks 50):

-End-semester practical exam: 25 marks

-Continuous evaluation of practicals on a predecided key: 25 marks

KEYWORDS:

- Department of Home Science
- Malnutrition
- Food security

Facilitating the achievement of course learning objectives

Unit no.	Course learning outcomes	Teaching and learning activities	Assessment tasks
1	Students would get an in-depth knowledge of various nutritional problems and strategies for their prevention	Lectures, power point presentations, discussion and searching e-resources on latest developments	Applicable based objective and long answer question
2	Students will get an overview of food based, health based and education based strategies for improving health and nutritional status of the community	Theory with examples	Class test
3	Students will become aware of government efforts to ensure	Lecture and searching e-resources for updates national programmes	Planning low cost dishes for

	health of the community		supplementary nutrition and nutrition education
4	Students will gain knowledge of the concept of food security and the steps that can be taken to achieve the same	Theory class supplemented with searching e-resources for latest government programmes	Case study on devising a strategy for improving food and nutrition security in a given set-up; short and long answer questions

***Assessment tasks listed here are indicative and may vary.**

**GE-NHE-4: CULINARY FOOD SCIENCE
(CREDITS: 6; THEORY-4, PRACTICAL-2)**

COURSE OBJECTIVES:

- To familiarize students with the science and skill behind cooking so as to enable them to obtain maximum benefit from available food resources.
- To introduce students to basic concepts of food storage and preservation so that they can adopt those techniques at the household level.

COURSE LEARNING OUTCOMES: After completing this course the learner will be able to:

- Understand the science and principles underlying cooking.
- Explain how to obtain maximum benefit from foods and minimize nutrient losses during cooking.
- Describe various cooking methods and demonstrate skills in using them to prepare a variety of dishes.
- Discuss issues related to food hygiene and practically adopt hygienic practices in food preparation.
- Understand and apply principles of preservation at the household level.

THEORY:

CONTENTS

PERIODS: 60 (4 credits)

UNIT I: Science of Cooking

30

- Advantages of cooking food
- Principles of cooking
- Pre-preparation steps in cooking-an overview
- Cooking methods
 - Moist heat methods
 - Dry heat methods
 - Methods using fat as a medium
 - Others: Microwave cooking, Solar cooking
- Role of cereals, pulses, milk, eggs, fat and sugar in cookery
- Effect of cooking on food components
- Minimizing nutrient losses during food preparation

Rekhi T &Yadav H.(2015). *Fundamentals of food and nutrition*. Delhi: Elite Publishing House (P) Ltd. Chapters 2, pg 15-26

Mudambi SR & Rajagopal MV.(2012). *Fundamentals of food, nutrition and diet therapy*; (6thed). Delhi: New Age International (P) Ltd. Chapter 19-20, pg 226-240

UNIT II: Food Hygiene

15

- Selection, purchase and storage of perishable, semi-perishable and non-perishable foods
- Good hygiene practices during food preparation
- WHO Five Keys to safer food

Mudambi SR & Rajagopal MV.(2012). *Fundamentals of food, nutrition and diet therapy*; (6thed). Delhi: New Age International (P) Ltd. Chapter 18,22, pg 213-225, 246-253.

Suri S & Malhotra A.(2014). *Food Science, Nutrition and Safety*. Delhi: Pearson. Chapter 24, pg 332-333.

UNIT III: Food Preservation

15

- Meaning and importance of food preservation
- Principles of preservation
- Home level preservation-methods with examples

Suri S & Malhotra A.(2014). *Food Science, Nutrition and Safety*. Delhi: Pearson. Chapter 24, pg 301-306.

PRACTICAL:

PERIODS: 60 (4 credits)

-Weights and measures and culinary terms; Rechauffé'

-Understanding concept of portion size and preparing a variety of dishes using various cooking methods:

- Beverages: tea/coffee, milk shake, lassi, fruit based beverages
- Cereals: boiled rice, pulao, chapatti, paratha, puri, pastas
- Pulses: whole, dehusked
- Vegetables: curries and dry preparations
- Milk based dishes: kheer, custard
- Egg, meat, fish and poultry preparations
- Soups and salads
- Snacks: pakoras, cutlets, samosas, upma, poha, sandwiches
- Chutneys and dips

COMPULSORY READINGS:

- Mudambi SR & Rajagopal MV.(2012). *Fundamentals of food, nutrition and diet therapy*; (6th ed). Delhi: New Age International (P) Ltd.
- Raina U et al.(2010). *Basic food preparation-a complete manual*. (4th ed). Delhi: Orient Blackswan.
- Sethi P& Lakra P (2015). *Aahar vigyan, poshan evam suraksha (Hindi)*. Delhi: Elite Publishing House (P) Ltd.
- Suri S & Malhotra A.(2014). *Food Science, Nutrition and Safety*. Delhi: Pearson.

ADDITIONAL RESOURCES:

- Mudambi SR, Rao SM, Rajagopal MV.(2012). *Food science*. (2nd ed). Delhi: New Age International (P) Ltd.
- Rekhi T & Yadav H.(2015). *Fundamentals of food and nutrition*. Delhi: Elite Publishing House (P) Ltd.
- Srilakshmi B.(2018). *Food science*. (7th ed). Delhi: New Age International (P) Ltd.

TEACHING LEARNING PROCESS:

- Lectures
- Use of prescribed textbooks and handouts
- Power point presentations
- Practicum

ASSESSMENT METHODS:

As per University of Delhi norms

For each course the assessment is as follows:

For theory (maximum marks 100):

-End semester exam: 75 marks

-Internal Assessment: 25 marks (Class test- 10 marks; Assignment- 10 marks; Attendance- 5 marks)

For practical (maximum marks 50):

-End-semester practical exam: 25 marks

-Continuous evaluation of practicals on a predecided key: 25 marks

KEYWORDS:

- Department of Home Science
- Cooking
- Hygiene
- Preservation

Facilitating the achievement of course learning objectives

Unit no.	Course learning outcomes	Teaching and learning activities	Assessment tasks
1	Students would have gained a comprehensive understanding of the art and science of cooking and its effect on nutritional value of foods	Theory classes and power point presentations describing cooking methods and their implications in nutrition	Assignment on choosing healthy cooking methods and describing recipes based on them along with the underlying principles
2	Students would gain knowledge regarding role of different foods, their purchase and proper storage. They would understand the importance of food safety and hygiene and ways to ensure it.	Theory classes, discussion	Case study of food service establishment to gain an insight into food safety and hygiene issues, class test
3	Students would get an overview of the importance, principles and household methods of food preservation	Power point presentation	Long answer questions, developing recipes for preserved food items

***Assessment tasks listed here are indicative and may vary.**

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