B.A (Prog.) with Nutrition and Health Education (NHE) as Major

Category-II

DISCIPLINE SPECIFIC CORE COURSE – DSC-1-NHE: FUNDAMENTALS OF NUTRITION

Credit distribution, Eligibility and Pre-requisites of the Course

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Fundamentals of Nutrition	4	3	1	-	Class XII Pass	NIL

Learning Objectives:

1. To familiarize students with fundamentals of nutrition and their relation to health.
2. To study the functions, dietary sources and clinical manifestations of deficiency or excess of nutrients.
3. To create awareness about enhancing nutritional quality of food.

Learning Outcomes:

After completion of the course, the students will be able to:

1. Understand basic concepts in nutrition and interpret relation between food, nutrition and health.
2. Describe functions, dietary sources and clinical manifestations of deficiency or excess of important nutrients.
3. Understand healthy cooking practices and minimizing nutrient losses.
4. Describe various methods of enhancing nutritional quality of food.

SYLLABUS OF DSC-1

Theory:

Unit 1: Basic Concepts in Nutrition **(7 Hours)**

- *Unit Description***:** This unit will introduce the basic terms in nutrition
- *Subtopics:*
  - Basic terms used in study of nutrition – food, health, nutrients, nutritional status, malnutrition.
  - Macronutrients, micronutrients, nutraceuticals, phytochemicals, antioxidants and balanced diet.
  - Understanding relationship between food, nutrition and health.

Unit 2: Energy, Macronutrients and Water **(13 Hours)**

- *Unit Description:* This unit will introduce the students to energy components, macronutrients and water.
- *Subtopics:*
  - Energy- Components of energy expenditure and factors affecting energy requirement.

- Classification, functions, dietary sources and clinical manifestations of deficiency/excess of the following:
  - Carbohydrates including dietary fibre.
  - Dietary fat and fatty acids; introduction to lipoproteins (LDL & HDL)
  - Protein including protein quality

Unit 3: Micronutrients (18 Hours)

- *Unit Description:* This unit will introduce the various vitamins and minerals present in foods.
- *Subtopics:*

- Functions, dietary sources and clinical manifestations of deficiency /excess of the following:
  - Fat soluble vitamins – A, D, E and K.
  - Water soluble vitamins – thiamine, riboflavin, niacin, pyridoxine, folic acid, vitamin B_{12} and vitamin C.
  - Minerals – calcium, iron, iodine, zinc, sodium and potassium.

Unit 4: Enhancing Nutritional Quality of Food (7 Hours)

- *Unit Description*: This unit will explain ways to minimize nutrient losses and enhance nutritional quality of food
- *Subtopics:*
  - Minimizing nutrient losses during food preparation.
  - Enhancing nutritional quality by supplementation, germination, fermentation and fortification.

Essential/recommended readings:

1. Rekhi, T., & Yadav, H. (2015). *Fundamentals of Food and Nutrition.* Delhi: Elite Publishing House Pvt. Ltd.
2. Mudambi, S. R., & Rajagopal M. V. (2012). *Fundamentals of food, nutrition and diet therapy*; (6th ed.). Delhi: New Age International (P) Ltd.
3. Sethi, P., & Lakra, P. (2015). *Aahar Vigyan, Poshan Evam Suraksha*. Delhi: Elite Publishing House Pvt. Ltd.
4. Chadha, R., & Mathur, P. (2015). *Nutrition: A life cycle approach*. Delhi: Orient Blackswan.
5. Srilakshmi, B. (2018). *Food science* (7th ed.) Delhi: New Age International (P) Ltd.

Suggested readings:

1. Roday, S. (2013). *Food science and nutrition*. (2nd ed.). Oxford University Press.
2. Wardlow, G. M., & Hampl, J. S. (2019). *Perspectives in nutrition.* (11th ed.). New York, NY: McGraw Hill.
3. Agarwal, A., & Udipi. S. (2014). *Textbook of human nutrition*, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi.

DISCIPLINE SPECIFIC CORE COURSE – DSC-2-NHE: INTRODUCTION TO FOODS

Credit distribution, Eligibility and Pre-requisites of the Course

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Introduction to Foods	4	3	-	1	Class XII Pass	NIL

Learning Objectives:

1. To introduce students with the functions of food.
2. To explain the nutritional contribution, selection, changes in cooking and storage of different food groups.
3. To generate awareness about various methods of cooking.

Learning Outcomes:

After completion of the course, the students will be able to:

1. Understand various functions of food and factors affecting food choices.
2. Acquaint themselves to select, purchase and store food safely.
3. Describe various methods of cooking and principles underlying them.

SYLLABUS OF DSC-2

Theory:

Unit 1: Basic Concepts of Food **(8 Hours)**

- *Unit Description:* This unit will introduce the concept of food, functions of food and factors affecting food choices.
- *Subtopics:*
  - Definition of food including organic food, genetically modified foods, convenience foods, health foods.
  - Functions of food.
  - Factors affecting food choices.

Unit 2: Plant Based Food Groups **(15 Hours)**

- *Unit Description:* This unit will introduce nutritional contribution, selection, changes in cooking and storage of the plant-based food groups.
- *Subtopics:*
  - Nutritional contribution, selection, changes in cooking and storage of the following:
    - Cereal and cereal products
    - Pulses
    - Vegetable and fruits
      - Sugars
      - Oils and fats

Unit 3: Animal Based Food Groups **(8 Hours)**

- *Unit Description:* This unit will introduce nutritional contribution, selection, changes in cooking and storage of the animal-based food groups.

- *Subtopics:*
    - Nutritional contribution, selection, changes in cooking and storage of the following:
        - Milk and milk products
        - Eggs and flesh foods

Unit 4: Methods of Cooking Foods **(14 Hours)**

- *Unit Description:* This unit will introduce advantages and principles of cooking and various cooking methods.
- *Subtopics:*
    - Advantages of cooking
    - Principles of cooking
    - Preliminary steps in food preparation
    - Cooking methods:
        - Moist heat methods
        - Dry heat methods
        - Methods using fat as a medium
        - Others – microwave, solar cooking

Practical:

Unit 1: Cooking methods I (16 Hours)

- *Subtopics:*
    - Cooking employing dry heat methods
    - Cooking employing moist heat methods

Unit 2: Cooking methods II **(14 Hours)**

- *Subtopics:*
    - Cooking using frying as a cooking method
    - Cooking using microwave

Essential/recommended readings:

1. Rekhi, T., & Yadav, H. (2015). *Fundamentals of Food and Nutrition.* Delhi: Elite Publishing House Pvt. Ltd.
2. Mudambi, S. R., & Rajagopal M. V. (2012). *Fundamentals of food, nutrition and diet therapy*; (6th ed.). Delhi: New Age International (P) Ltd.
3. Sethi, P., & Lakra, P. (2015). *Aahar Vigyan, Poshan Evam Suraksha*. Delhi: Elite Publishing House Pvt. Ltd.
4. Srilakshmi, B. (2018). *Food science* (7th ed.) Delhi: New Age International (P) Ltd.
5. Raina, U., & Kashyap, S. (2010). *Basic Food Preparation – a complete manual* (4th ed.). Delhi: Orient Black Swan.

Suggested readings:

1. Roday, S. (2013). *Food science and nutrition*. (2nd ed.). Oxford University Press.
2. Wardlow, G. M., & Hampl, J. S. (2019). *Perspectives in nutrition.* (11th ed.). New York, NY: McGraw Hill.
3. Agarwal, A., & Udipi. S. (2014). *Textbook of human nutrition*, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi.
4. Chadha, R., & Mathur, P. (2015). *Nutrition: A life cycle approach*. Delhi: Orient Blackswan.

B.A (Prog.) with Nutrition and Health Education (NHE) as Non-Major

Category-III

DISCIPLINE SPECIFIC CORE COURSE – DSC-2-NHE: INTRODUCTION TO FOODS

Credit distribution, Eligibility and Pre-requisites of the Course

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Introduction to Foods	4	3	-	1	Class XII Pass	NIL

Learning Objectives:

1. To introduce students with the functions of food.
2. To explain the nutritional contribution, selection, changes in cooking and storage of different food groups.
3. To generate awareness about various methods of cooking.

Learning Outcomes:

After completion of the course, the students will be able to:

1. Understand various functions of food and factors affecting food choices.
2. Acquaint themselves to select, purchase and store food safely.
3. Describe various methods of cooking and principles underlying them.

SYLLABUS OF DSC-1

Theory:

Unit 1: Basic Concepts of Food (8 Hours)

- *Unit Description:* This unit will introduce the concept of food, functions of food and factors affecting food choices.
- *Subtopics:*
  - Definition of food including organic food, genetically modified foods, convenience foods, health foods.
  - Functions of food.
  - Factors affecting food choices.

Unit 2: Plant Based Food Groups (15 Hours)

- *Unit Description:* This unit will introduce nutritional contribution, selection, changes in cooking and storage of the plant-based food groups.
- *Subtopics:*
  - Nutritional contribution, selection, changes in cooking and storage of the following:
    - Cereal and cereal products
    - Pulses
    - Vegetable and fruits

        - Sugars
        - Oils and fats

Unit 3: Animal Based Food Groups (8 Hours)

- *Unit Description:* This unit will introduce nutritional contribution, selection, changes in cooking and storage of the animal-based food groups.
- *Subtopics:*
    - Nutritional contribution, selection, changes in cooking and storage of the following:
        - Milk and milk products
        - Eggs and flesh foods

Unit 4: Methods of Cooking Foods (14 Hours)

- *Unit Description:* This unit will introduce advantages and principles of cooking and various cooking methods.
- *Subtopics:*
    - Advantages of cooking
    - Principles of cooking
    - Preliminary steps in food preparation
    - Cooking methods:
        - Moist heat methods
        - Dry heat methods
        - Methods using fat as a medium
        - Others – microwave, solar cooking

Practical:

Unit 1: Cooking methods I (16 Hours)

- *Subtopics:*
    - Cooking employing dry heat methods
    - Cooking employing moist heat methods

Unit 2: Cooking methods II (14 Hours)

- *Subtopics:*
    - Cooking using frying as a cooking method
    - Cooking using microwave

Essential/recommended readings:

1. Rekhi, T., & Yadav, H. (2015). *Fundamentals of Food and Nutrition.* Delhi: Elite Publishing House Pvt. Ltd.
2. Mudambi, S. R., & Rajagopal M. V. (2012). *Fundamentals of food, nutrition and diet therapy*; (6th ed.). Delhi: New Age International (P) Ltd.
3. Sethi, P., & Lakra, P. (2015). *Aahar Vigyan, Poshan Evam Suraksha*. Delhi: Elite Publishing House Pvt. Ltd.
4. Srilakshmi, B. (2018). *Food science* (7th ed.) Delhi: New Age International (P) Ltd.
5. Raina, U., & Kashyap, S. (2010). *Basic Food Preparation – a complete manual* (4th ed.). Delhi: Orient Black Swan.

Suggested readings:

1. Roday, S. (2013). *Food science and nutrition*. (2nd ed.). Oxford University Press.
2. Wardlow, G. M., & Hampl, J. S. (2019). *Perspectives in nutrition.* (11th ed.). New York, NY: McGraw Hill.
3. Agarwal, A., & Udipi. S. (2014). *Textbook of human nutrition*, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi.
4. Chadha, R., & Mathur, P. (2015). *Nutrition: A life cycle approach*. Delhi: Orient B lackswan.

Appendix-53
Resolution No. 38 {38-1 [38-1-3(11)]}

INDEX

Department of Home Science
Semester – II

B.A (Prog.) with Nutrition and Health Education (NHE)

B.A (Prog.) with Nutrition and Health Education (NHE) as Major

Category-II

DISCIPLINE SPECIFIC CORE COURSE – DSC-3-NHE: DIET PLANNING THROUGH THE LIFE SPAN

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Diet Planning Through the Life Span	4	3	-	1	Class XII Pass	DSC-1-NHE and DSC-2-NHE

Learning Objectives:

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

Learning Outcomes:

After completion of the course, the students will be able to:

1. Describe physiological changes and nutritional requirements across the lifespan.
2. Understand the factors affecting meal planning.
3. Understand the importance of food exchange list and use them for meal planning.
4. Plan and prepare balanced meals and nutritious snacks for various age groups.

SYLLABUS OF DSC-3

Theory:

Unit 1: Nutrient Requirements and Recommendations (5 Hours)

- *Unit Description***:** This unit will introduce the concept of dietary reference intake.

- *Subtopics:*
  - Nutrient requirement - concept and background
  - Dietary reference intake
  - EAR and RDA
  - Reference man and reference woman

Unit 2: Fundamentals of Menu Planning (6 Hours)

- *Unit Description:* This unit will introduce essential requirements for planning of meals.
- *Subtopics:*
  - Introduction and use of food exchange list
  - Concept and importance of meal planning
  - Factors affecting meal planning

Unit 3: Nutrition during Childhood **(16 Hours)**

- *Unit Description:* This unit will introduce nutritional requirement, physiological changes, nutritional concerns and healthy eating practices during childhood.
- *Subtopics:*
    - Infancy
    - Preschoolers
    - School- going children
    - Adolescents

Unit 4: Nutrition during Adulthood and Old Age **(18 Hours)**

- *Unit Description*: This unit will introduce nutritional requirement, physiological changes, nutritional concerns and healthy food choices during adulthood and old age.
- *Subtopics:*
    - Adulthood
    - Pregnancy
    - Lactation
    - Old age

Practical:

Unit 1: Introduction to Meal Planning **(10 Hours)**

- *Subtopics:*
    - Use of comprehensive food exchange list in meal planning
    - Meal distribution and menu planning
    - Nutrient calculations

Unit 2: Planning and Preparation of Diets/Dishes/Snacks **(20 Hours)**

- *Subtopics:*
    - Infant- complementary feeding
    - Preschooler child
    - School aged child
    - Adolescent
    - Adult
    - Pregnant and lactating woman
    - Elderly

Essential/recommended readings:

1. Chadha, R., & Mathur, P. (2015). *Nutrition: A life cycle approach*. Delhi: Orient Blackswan.
2. Sethi, P., & Lakra, P. (2015). *Aahar Vigyan, Poshan Evam Suraksha*. Delhi: Elite Publishing House Pvt. Ltd.
3. Mudambi, S. R., & Rajagopal M. V. (2012). *Fundamentals of food, nutrition and diet therapy* (6th ed.). Delhi: New Age International (P) Ltd.
4. 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.
5. Puri, S. et al (2020). *Food exchange list- A tool for meal planning.* New Delhi: Elite publishing house.
6. Longvah, T. et al (2017). *Indian food composition tables.* Hyderabad, Telangana: National Institute of Nutrition.

Suggested readings:

1. Wardlow, G. M., & Hampl, J. S. (2019). *Perspectives in nutrition.* (11th ed.). New York, NY: McGraw Hill.
2. Khanna, K. et al. (2013). *Textbook of nutrition and dietetics.* Delhi: Elite Publishing house (P) Ltd.
3. Shubhangini, A., & Joshi, S. (2021). *Nutrition and Dietetics* (5th ed.). McGraw Hill Education (India) Private Limited. ISBN: 978-93-90727-82-7.
4. Edelstein, S., & Sharlin, J. (Eds). (2009). *Life cycle nutrition – an evidence based approach* Burlington, MA: Jones and Barlett Publishers.

DISCIPLINE SPECIFIC CORE COURSE – DSC-4-NHE: DIETARY GOALS AND GUIDELINES FOR INDIANS

Credit distribution, Eligibility and Pre-requisites of the Course

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Dietary Goals and Guidelines for Indians	4	3	1	-	Class XII Pass	NIL

Learning Objectives:

1. To introduce the concept of nutritionally adequate diets and healthy lifestyles from conception

till old age.
2. To equip the students with the knowledge of dietary goals and guidelines for Indians relating to nutritional requirements, deficiency diseases and chronic diet-related disorders.

Learning Outcomes:

After completion of the course, the students will be able to:

1. Describe food groups, food pyramid and the concept of a balanced diet.
2. Understand the physiological changes throughout the lifespan.
3. Acquaint themselves with the dietary goals and dietary guidelines for Indians across the life cycle.

SYLLABUS OF DSC-4

Theory:

Unit 1: Basic Concepts of Food (9 Hours)

- *Unit Description:* This unit will introduce various food groups, concept of balanced diet, food pyramid and other aspects regarding diet.
- *Subtopics:*
  - Food groups: basic classification and nutritional contribution
  - Food pyramid
  - Balanced diet and My food plate
  - Food facts, fads and fallacies

Unit 2: Dietary Guidelines I (15 Hours)

- *Unit Description:* This unit will introduce basic dietary goals for healthy living and dietary guidelines.
- *Subtopics:*
  - Dietary goals
  - Guidelines to ensure nutritional adequacy and prevent deficiency diseases
  - Guidelines related to various stages of life

Unit 3: Dietary Guidelines II (13 Hours)

- *Unit Description:* This unit will introduce dietary guidelines to deal with health concerns and healthy food practices.
- *Subtopics:*
  - Guidelines to maintain an ideal body weight and prevent chronic diet-related disorders
  - Guidelines regarding food-related practices

Unit 4: Practical Application of Dietary Guidelines (8 Hours)

- *Unit Description:* This unit will introduce practical aspects with suitable examples

to attain all dietary guidelines for Indians.

- *Subtopics:*
  Sample eating patterns/ menus for the following meals/ snacks:
  - Breakfast
  - Lunch/packed lunch
  - Dinner
  - Snacks

Essential/recommended readings:

1. Damyanthi, K. et al. (2011). *Dietary guidelines for Indians- A manual.* (2nd ed.) Hyderabad. National Institute of Nutrition.
2. Chadha, R., & Mathur, P. (2015). *Nutrition: A life cycle approach*. Delhi: Orient Blackswan.
3. Agarwal, A., & Udipi. S. (2014). *Textbook of human nutrition*, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi.
4. Sethi, P., & Lakra, P. (2015). *Aahar Vigyan, Poshan Evam Suraksha*. Delhi: Elite Publishing House Pvt. Ltd.

Suggested readings:

1. Mudambi, S. R., & Rajagopal M. V. (2012). *Fundamentals of food, nutrition and diet therapy* (6th ed.). Delhi: New Age International (P) Ltd.
2. Wardlow, G. M., & Hampl, J. S. (2019). *Perspectives in nutrition.* (11th ed.). New York, NY: McGraw Hill.
3. Shubhangini, A., & Joshi, S. (2021). *Nutrition and Dietetics* (5th ed.). McGraw Hill Education (India) Private Limited. ISBN: 978-93-90727-82-7.
4. Khanna, K. et al. (2013). *Textbook of nutrition and dietetics.* Delhi: Elite Publishing house (P) Ltd.

B.A (Prog.) with Nutrition and Health Education (NHE) as Non-Major

Category-III

DISCIPLINE SPECIFIC CORE COURSE – DSC-4-NHE: DIETARY GOALS AND GUIDELINES FOR INDIANS

Credit distribution, Eligibility and Pre-requisites of the Course

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Dietary Goals and Guidelines for Indians	4	3	1	-	Class XII Pass	NIL

Learning Objectives:

1. To introduce the concept of nutritionally adequate diets and healthy lifestyles from conception till old age.
2. To equip the students with the knowledge of dietary goals and guidelines for Indians relating to nutritional requirements, deficiency diseases and chronic diet-related disorders.

Learning Outcomes:

After completion of the course, the students will be able to:

1. Describe food groups, food pyramid and the concept of a balanced diet.
2. Understand the physiological changes throughout the lifespan.
3. Acquaint themselves with the dietary goals and dietary guidelines for Indians across the life cycle.

SYLLABUS OF DSC-2

Theory:

Unit 1: Basic Concepts of Food **(9 Hours)**

- *Unit Description:* This unit will introduce various food groups, concept of balanced diet, food pyramid and other aspects regarding diet.
- *Subtopics:*
  - Food groups: basic classification and nutritional contribution
  - Food pyramid
  - Balanced diet and My food plate
  - Food facts, fads and fallacies

Unit 2: Dietary Guidelines I **(15 Hours)**

- *Unit Description:* This unit will introduce basic dietary goals for healthy living and dietary guidelines.
- *Subtopics:*
    - Dietary goals
    - Guidelines to ensure nutritional adequacy and prevent deficiency diseases
    - Guidelines related to various stages of life

Unit 3: Dietary Guidelines II **(13 Hours)**

- *Unit Description:* This unit will introduce dietary guidelines to deal with health concerns and healthy food practices.
- *Subtopics:*
    - Guidelines to maintain an ideal body weight and prevent chronic diet-related disorders
    - Guidelines regarding food-related practices

Unit 4: Practical Application of Dietary Guidelines **(8 Hours)**

- *Unit Description:* This unit will introduce practical aspects with suitable examples to attain all dietary guidelines for Indians.
- *Subtopics:*
  Sample eating patterns/ menus for the following meals/ snacks:
    - Breakfast
    - Lunch/packed lunch
    - Dinner
    - Snacks

Essential/recommended readings:

1. Damyanthi, K. et al. (2011). *Dietary guidelines for Indians- A manual.* (2nd ed.) Hyderabad. National Institute of Nutrition.
2. Chadha, R., & Mathur, P. (2015). *Nutrition: A life cycle approach*. Delhi: Orient Blackswan.
3. Agarwal, A., & Udipi. S. (2014). *Textbook of human nutrition*, Jaypee Brothers Medical Publishers (P) Ltd, New Delhi.
4. Sethi, P., & Lakra, P. (2015). *Aahar Vigyan, Poshan Evam Suraksha*. Delhi: Elite Publishing House Pvt. Ltd.

Suggested readings:

1. Mudambi, S. R., & Rajagopal M. V. (2012). *Fundamentals of food, nutrition and diet therapy* (6th ed.). Delhi: New Age International (P) Ltd.

2. Wardlow, G. M., & Hampl, J. S. (2019). *Perspectives in nutrition.* (11th ed.). New York, NY: McGraw Hill.
3. Shubhangini, A., & Joshi, S. (2021). *Nutrition and Dietetics* (5th ed.). McGraw Hill Education (India) Private Limited. ISBN: 978-93-90727-82-7.
4. Khanna, K. et al. (2013). *Textbook of nutrition and dietetics.* Delhi: Elite Publishing house (P) Ltd.

INDEX

Department of Home Science
Semester – III

B.A (Prog) with Nutrition and Health Education (NHE)

B.A (Prog) with Nutrition and Health Education (NHE) as Major

Category-II

DISCIPLINE SPECIFIC CORE COURSE – DSC-5-NHE: FOOD REPORTING AND WRITING

CREDIT DISTRIBUTION, ELIGIBILITY AND PREREQUISITES OF THE COURSE

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Food Reporting and Writing	4	3	0	1	Class XII	Nil

LEARNING OBJECTIVES:

1. To introduce students to the concept and prospects of food reporting.
2. To make the students learn to creatively write their own food stories for different forms of food media.
3. To help students gain an understanding of the wide-ranging and pervasive nature of food reporting and writing.
4. To make the students understand the importance of food reporting and writing for creating a sustainable food future.

LEARNING OUTCOMES:

After completion of the course, the students will be able to:

1. Hone food reporting skills and critical analysis of different forms of food media.
2. Create original food writing appraising the sustainable essence of food.
3. Articulate how food writing and reporting can be used as a medium for attaining a sustainable food future.

SYLLABUS OF DSC-5

THEORY
(Credits 3: 45 Hours)

Unit 1: Food Reporting **(10 Hours)**

- *Unit Description*: This unit will introduce the concept of food reporting, different steps involved, skills required to become a good food reporter and the future prospects of food reporting.

- *Subtopics:*
  - Concept of food reporting
  - Steps of reporting
  - Skills of a good food reporter
  - Prospects of food reporting

Unit 2: Food Writing **(15 Hours)**

- *Unit Description:* This unit will train the students to become a good café/restaurant critic as well as help in developing their writing skills for different forms of food media.

- *Subtopics:*
  - Guidelines to write a good food review
  - How to become a good café/restaurant critic
  - Recipe writing
  - Food writing in newspapers, magazines, social media, food blogs

Unit 3: Food Reporting and Writing on Sustainability Issues **(20 Hours)**

- *Unit Description:* This unit will lay emphasis on food reporting and writing on sustainablility issues for achieving nutrition security and a sustainable food future.

- *Subtopics:*
  - Importance of food reporting and writing on sustainability issues
  - Food writing and reporting on sustainability issues:
    - Shifting to healthier and more sustainable foods/diets
    - Reduce food loss and waste
    - Consumption of millets for sustainable agriculture and attaining nutrition security
    - Smart farming – the next green revolution
    - Going green – demand for organic food
    - Growing local – going global

PRACTICAL
(Credits 1: 30 Hours)

Unit 1: Food Reporting **(15 Hours)**

- *Subtopics:*
  - Interview a cook/chef
  - Critical reporting of food related information across various forms of media

Unit 2: Food Writing **(15 Hours)**

- *Subtopics:*
  - Visiting a café/restaurant and writing a review
  - Authentic ethnic food essay
  - Crafting food memoir
  - Travel related food story
  - Food blog on sustainability issues

ESSENTIAL/RECOMMENDED READINGS:

1. Jacob, D. (2010) Will Write for Food. 2nd edition. Cambridge: Da Capo Press.
2. Hughes,H. (2017) Best food writing. 1st edition. New York, NY, Da Capo Lifelong.
3. Siniauer, P. (2015) Writing about Food – a guide to good food journalism. Freie Universität Berlin Helsingin Sanomat Foundation. https://www.hssaatio.fi/wp-content/uploads/2015/07/Siniauer_WRITE-ABOUT-FOOD-a-guide-to-good-food-journalism.pdf
4. Gilbert, S. & Porter, R. (Eds). (2015). Eating Words: The Norton Anthology of Food Writing. New York: W. W. Norton & Company.

SUGGESTED READINGS:

1. Fusté-Forné, Francesc & Masip, Pere. (2019). *Food and journalism*. 10.4324/9781351123389-11.
2. Searchinger, T., Waite, R., & Hanson, C., & Ranganathan, J. (2019). World Resources Institute. World Resources Report. Creating a sustainable food future – a menu of solutions to feed nearly 10 billion people by 2050. Matthews, E (Ed.). https://research.wri.org/sites/default/files/2019-07/WRR_Food_Full_Report_0.pdf
3. Cox, A. M., & Blake, M. K. (2011). Information and food blogging as serious leisure. Aslib Proceedings, 63 (2/3). pp. 204-220. ISSN 0001-253X http://dx.doi.org/10.1108/00012531111135664
4. David, B., Branigin H, Beurle, C. The future of food feeding the world – the coming food revolution. Future IQ. https://future-iq.com/wp-content/uploads/2016/03/Future-iQ-Partners-Future-of-Food.pdf

DISCIPLINE SPECIFIC CORE COURSE – DSC-6-NHE: BASICS OF FOOD SAFETY

CREDIT DISTRIBUTION, ELIGIBILITY AND PREREQUISITES OF THE COURSE

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Basics of Food Safety	4	3	1	0	Class XII	Nil

LEARNING OBJECTIVES:

1. To introduce students to the basic concepts of food safety, hygiene, and types of microorganisms associated with food.

2. To equip them with the knowledge of food adulteration and contamination, food borne diseases, and role of microbes in food spoilage.

LEARNING OUTCOMES:

After completion of the course students will be able to:

1. Understand the important genera of microorganisms associated with food and their characteristics.
2. Explain the role of microbes in food spoilage and food borne diseases.
3. Describe food safety and hygiene, types of hazards associated with food.
4. Understand current food safety and standard regulations.

SYLLABUS OF DSC-6

THEORY
(Credits 3: 45 Hours)

Unit 1: Introduction to Food Safety (7 Hours)

- *Unit Description:* This unit will introduce the concept of food safety, hazards and factors affecting food safety.

- *Subtopics*
  - Definitions
  - Importance of food safety
  - Factors affecting food safety
  - Types of hazards
  - Safe-Unsafe food for consumption

Unit 2: Microorganisms in Food (16 Hours)

- *Unit Description:* This unit will introduce the important genera of microorganisms associated with food, their characteristics and factors affecting it.

- *Subtopics:*
  - Bacteria, yeast, mold and virus
  - Role of microbes in food spoilage
  - Food infection and intoxication
  - Food poisoning

Unit 3: Food Safety and Quality Assurance (12 Hours)

- *Unit Description:* This unit will introduce the food additives, adulteration and food regulations.

- *Subtopics:*
  - Food additives
  - Food adulteration
  - Nutritional labelling
  - Food safety and standard regulation

- HACCP, GMP, GHP

Unit 4: Recent Concerns of Food Safety **(10 Hours)**

- *Unit Description:* This unit will introduce the emerging concerns and new challenges to food safety.

- *Subtopics:*
  - Emerging concerns for food safety
  - Street food safety
  - New challenges to food safety

ESSENTIAL/RECOMMENDED READINGS:

1. Forsythe, S J. (1987) Microbiology of Safe Food.USA: Blackwell Science, Oxford.
2. Frazier, William C. and Westhoff, Dennis C. (2004). Food Microbiology. New Delhi: TMH.
3. Garbutt, John. (1997). Essentials of Food Microbiology. London: Arnold.
4. Jay, James M. (2000). Modern Food Microbiology. New Delhi: CBS Publication.
5. Mathur, P. (2018). Food Safety and Quality Control. Hyderabad: Orient Black Swan Pvt. Ltd.
6. Sethi, P., & Lakra P. (2015). Aahaar Vigyaan, Poshan evam Suruksha, Elite Publishing House.
7. Suri, S., & Malhotra A. (2014). Food Science, Nutrition and Safety. Delhi: Pearson.

SUGGESTED READINGS:

1. De Vries. (1997). Food Safety and Toxicity. New York: CRC.
2. Lawley, R., Curtis L. & Davis, J. (2004). The Food Safety Hazard Guidebook. RSC
3. Publishing.
4. Marriott, Norman G. (1985). Principles of Food Sanitation. New York: AVI.
5. Pelczar, M.J., Chan E.C.S & Krieg, Noel. R. (1993) Microbiology, 5th Ed. New Delhi: TMH.

B.A (Prog) with Nutrition and Health Education (NHE) as Non-Major

Category-III

DISCIPLINE SPECIFIC CORE COURSE – DSC-6-NHE: BASICS OF FOOD SAFETY

CREDIT DISTRIBUTION, ELIGIBILITY AND PREREQUISITES OF THE COURSE

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Basics of Food Safety	4	3	1	0	Class XII	Nil

LEARNING OBJECTIVES:

1. To introduce students to the basic concepts of food safety, hygiene, and types of microorganisms associated with food.
2. To equip them with the knowledge of food adulteration and contamination, food borne diseases, and role of microbes in food spoilage.

LEARNING OUTCOMES:

After completion of the course students will be able to:

1. Understand the important genera of microorganisms associated with food and their characteristics.
2. Explain the role of microbes in food spoilage and food borne diseases.
3. Describe food safety and hygiene, types of hazards associated with food.
4. Understand current food safety and standard regulations.

SYLLABUS OF DSC-6

THEORY
(Credits 3: 45 Hours)

Unit 1: Introduction to Food Safety **(7 Hours)**

- *Unit Description:* This unit will introduce the concept of food safety, hazards and factors affecting food safety.

- *Subtopics:*
  - Definitions
  - Importance of food safety
  - Factors affecting food safety
  - Types of hazards

- Safe-Unsafe food for consumption

Unit 2: Microorganisms in Food **(16 Hours)**

- *Unit Description:* This unit will introduce the important genera of microorganisms associated with food, their characteristics and factors affecting it.

- *Subtopics:*
  - Bacteria, yeast, mold and virus
  - Role of microbes in food spoilage
  - Food infection and intoxication
  - Food poisoning

Unit 3: Food Safety and Quality Assurance **(12 Hours)**

- *Unit Description:* This unit will introduce the food additives, adulteration and food regulations.

- *Subtopics:*
  - Food additives
  - Food adulteration
  - Nutritional labelling
  - Food safety and standard regulation
  - HACCP, GMP, GHP

Unit 4: Recent Concerns of Food Safety **(10 Hours)**

- *Unit Description:* This unit will introduce the emerging concerns and new challenges to food safety.

- *Subtopics:*
  - Emerging concerns for food safety
  - Street food safety
  - New challenges to food safety

ESSENTIAL/RECOMMENDED READINGS:

1. Forsythe, S J. (1987) Microbiology of Safe Food.USA: Blackwell Science, Oxford.
2. Frazier, William C. and Westhoff, Dennis C. (2004). Food Microbiology. New Delhi: TMH.
3. Garbutt, John. (1997). Essentials of Food Microbiology. London: Arnold.
4. Jay, James M. (2000). Modern Food Microbiology. New Delhi: CBS Publication.
5. Mathur, P. (2018). Food Safety and Quality Control. Hyderabad: Orient Black Swan Pvt. Ltd.
6. Sethi, P., & Lakra, P. (2015). Aahaar Vigyaan, Poshan evam Suruksha, Elite Publishing House.
7. Suri, S., & Malhotra A. (2014). Food Science, Nutrition and Safety. Delhi: Pearson.

SUGGESTED READINGS:

1. De Vries. (1997). Food Safety and Toxicity. New York: CRC.
2. Lawley, R., Curtis L. & Davis, J. (2004). The Food Safety Hazard Guidebook. RSC
3. Publishing.
4. Marriott, Norman G. (1985). Principles of Food Sanitation. New York: AVI.
5. Pelczar, M.J., Chan E.C.S & Krieg, Noel. R. (1993) Microbiology, 5th Ed. New Delhi: TMH.

Appendix-43
Resolution No. 14-1 (14-1-6)

INDEX
Department of Home Science

B.A (Prog) with Nutrition and Health Education (NHE)

SEMESTER-IV

B.A (Prog.) with Nutrition and Health Education (NHE) as Major

Category-II

DISCIPLINE SPECIFIC CORE COURSE

DSC- 7-NHE: Food Hygiene Sanitation and Quality Control

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title and Code	Credits	Credit distribution of the course			Eligibility Criteria	Pre-requisite of the course
		Lecture	Tutorial	Practical/ Practice		
Food Hygiene Sanitation and Quality Control	4	3	1	0	XII Pass	NIL

Learning Objectives

- To introduce students to the basic concepts of food hygiene, quality control, WASH and Swachh Bharat Abhiyan
- To equip them with the knowledge of basic principles of hygienic storage and preservation of food, microbiological safety at various food operations
- To enable students to understand the concept of quality control and sanitation standards/regulations

Learning Outcomes

After completion of the course students will be able to:

- Explain the concept of hygiene and sanitation at different levels of food handling
- Understand the microorganisms involved in food spoilage, food infection and intoxication, mode of transmission of microorganisms, methods of food preservation
- Understand the concept of total quality management, WHO five keys to safer food, sanitation standards and regulations

SYLLABUS OF DSC-7

THEORY
(Credits 3; Hours 45)

UNIT I: Concept of Hygiene and Sanitation **8 Hours**

This unit will introduce the concept of WASH, various adverse health effects related to sanitation and hygiene; Swachh Bharat Abhiyan.

- Water, Sanitation and Hygiene (WASH)
- Sanitation and hygiene health effects
- Swachh Bharat Abhiyan

UNIT II: Food Hygiene and Sanitation **15 Hours**

This unit will acquaint the students with the concept of food hygiene and sanitation at different levels of food handling.

- Personal hygiene
- Environmental hygiene
- Sanitation and hygiene during food handling practices (preparing, cooking and holding food)
- Food hygiene at food service institutions
- Food waste management

UNIT III: Food Borne Microbial Diseases **10 Hours**

This unit will introduce the concept of public health hazard, mode of transmission of microorganisms, principles of food preservation, food storage.

- Public health hazards
- Food infection, intoxication and poisoning – symptoms, mode of transmission, and prevention
- Food storage (selection, purchase and storage of perishable, semi-perishable and non-perishable foods)
- Principles and methods of food preservation

UNIT IV: Quality Management **12 Hours**

This unit will introduce the concept of total quality management, WHO five keys to safer food, hygiene and sanitation regulations/standards.

- Characteristics of quality
- Quality control, quality assurance
- Total Quality Management (TQM)
- Risk analysis
- HACCP, GMP, GHP
- WHO five keys to safer food
- Hygiene and sanitation regulations/standards

TUTORIALS
(Credits 1; Hours 15)

Tutorial classes will involve:

1. Q&A sessions/ Group Discussions/ Problem Solving exercises with the Students
2. Presentation of project/ research activity by students
3. Any other scholastic work related to application of conceptual understanding of the subject
4. Evaluation and feedback by the teacher

ESSENTIAL/RECOMMENDED READINGS

- Roday, S. (2011). *Food hygiene and sanitation* (2nd ed.). Tata Mc Graw Hill.
- Mathur, P. (2018). *Food safety and quality control*. Orient Black Swan Pvt. Ltd.
- Marriott, N. G., Schilling, M. W., & Gravani, R. B. (2018). *Principles of food sanitation*. (6th ed.). Springer International Publishing.
- Sethi, P., & Lakra, P. (2015). *Aahaar vigyaan, poshan evam suruksha*, Elite Publishing House.
- Suri, S. & Malhotra A. (2014). *Food science, nutrition and safety*. Pearson.
- Frazier, W. C., Westhoff, D. C. (2017). *Food microbiology*. (5th edn.). McGraw Hill Education.
- Swachh Bharat Mission-Grameen, Department of Drinking Water and Sanitation, Ministry of Jal Shakti, Government of India. https://swachhbharatmission.gov.in (Accessed on 10 March 2023).
- UNICEF. *Water, Sanitation and Hygiene (WASH).* https://www.unicef.org/wash. (Accessed on 10 March 2023).

SUGGESTED READINGS

- Lawley, R., Curtis L. & Davis, J. (2012). *The food safety hazard guidebook.* RSC Publishing.
- Forsythe, S.J. (2010). *The microbiology of safe food.* (2nd ed.). Wiley-Blackwell.
- Blackburn, C. D.W. & Mc Clure, P.J. (2005). *Food borne pathogens. Hazards, risk analysis & control*. CRC Press.
- Mortimore, S., & Wallace, C. (1995). *HACCP – A practical approach*. Chapman
- Jay, J. M. (2012). *Modern food microbiology*. (4th edn.). Springer.
- WHO. *Water Sanitation and Health.* https://www.who.int/health-topics/water-sanitation-and-hygiene-wash. (Accessed on 10 March 2023).

DISCIPLINE SPECIFIC CORE COURSE

DSC-NHE-8: Nutrition Entrepreneurship

CREDIT DISTRIBUTION, ELIGIBILTY AND PREREQUISITES OF THE COURSE

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Nutrition Entrepreneurship	4	3	0	1	XII Pass	NIL

Learning Objectives

- To introduce the concept and explain the opportunities in the field of nutrition entrepreneurship
- To equip the students with the necessary knowledge and skills to develop a nutritious

product and set up an entrepreneurial venture for the same

- To provide information regarding Government of India's initiatives to encourage entrepreneurship and other mandatory requirements in order to facilitate start-up ventures by the students

Learning Outcomes

After completing this course, the learner will able to:

- Understand the significance of nutrition entrepreneurship in today's times
- Identify nutritious products for different target consumers and draw up a business plan for the production of the same
- Know the funding agencies/ institutions which can be approached for getting assistance in an entrepreneurial venture

SYLLABUS OF DSC-NHE-8

THEORY
(Credits 3; Hours 45)

UNIT I: Introduction to Nutrition Entrepreneurship **9 Hours**

This unit will introduce the concept of nutrition entrepreneurship and apprise the students of the opportunities in the field

- Meaning, concept and scope of nutrition-entrepreneurship
- Food and nutrition start-up: trends, opportunities and challenges
- Start-up life cycle

UNIT II: Nutrition Based Enterprise **18 Hours**

This unit will impart knowledge regarding steps to be undertaken for setting up a nutrition based food business.

- Qualities/ traits of an entrepreneur
- Development of innovative nutritious products
- Computation of nutritive value of the product
- Development of business plan for a nutritious food
- Resource management

UNIT III: Guidelines for an Entrepreneurial Venture **18 Hours**

This unit will familiarize the students with Government of India's initiatives to promote entrepreneurship and necessary requirements to become nutrition-entrepreneur.

- Intellectual property rights
- Government schemes/ initiatives to support start-ups and promote entrepreneurship
- Food Safety Compliance System (FoSCoS) by FSSAI
- FSSAI guidelines for a food start-up

PRACTICAL
(Credit 1; Hours 30)

1. Planning of innovative nutrient rich products
2. Computation of nutritive value of the products and justifying their nutritional superiority in comparison to existing products
3. Formulation of a hypothetical business proposal for a funding agency
4. Advertising for the products planned
5. Preparation of food product acceptance checklist

ESSENTIAL/ RECOMMENDED READINGS

- Taneja, S. (2014). *Entrepreneur development*. Delhi: Himalaya Publishing House.
- FSSAI. *Food Safety Compliance System (FoSCoS).* https://foscos.fssai.gov.in. (Accessed on 10 March 2023).
- Start-up India. (2022). *Schemes.* Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, Government of India. https://www.startupindia.gov.in/content/sih/en/government-schemes.html (Accessed on 10 March 2023).
- FSSAI. *Guide for food start-ups.* https://fostac.fssai.gov.in/assets/docs/guide-for-food-startup.pdf (Accessed on 10 March 2023).
- FSSAI. *Food start-up in India – opportunities and challenges* https://www.fssai.gov.in/upload/media/FSSAI_News_Startup_FNB_26_02_2019.pdf. (Accessed on 10 March 2023).
- Sudheer, K. P., & Indira, V. (Eds.) (2022). *Entrepreneurship development in food processing.* New India Publishing Agency.

SUGGESTED READINGS

- Narayan, J., & Bala, P. (2016). *Start up your own restaurant.* Harper Collins.
- Green, K. (2017). *Recipe for success – the ingredients of a profitable food business.* Troubador Publishing Limited.

B.A (Prog.) with Nutrition and Health Education (NHE) as Non-Major

Category-III

DISCIPLINE SPECIFIC CORE COURSE
DSC-8-NHE: Nutrition Entrepreneurship

CREDIT DISTRIBUTION, ELIGIBILTY AND PREREQUISITES OF THE COURSE

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Nutrition Entrepreneurship	4	3	0	1	XII Pass	NIL

Learning Objectives

- To introduce the concept and explain the opportunities in the field of nutrition entrepreneurship
- To equip the students with the necessary knowledge and skills to develop a nutritious product and set up an entrepreneurial venture for the same
- To provide information regarding Government of India's initiatives to encourage entrepreneurship and other mandatory requirements in order to facilitate start-up ventures by the students

Learning Outcomes

After completing this course, the learner will able to:

- Understand the significance of nutrition-entrepreneurship in today's times
- Identify nutritious products for different target consumers and draw up a business plan for the production of the same
- Know the funding agencies/ institutions which can be approached for getting assistance in an entrepreneurial venture

SYLLABUS OF DSC-NHE-8

THEORY
(Credits 3; Hours 45)

UNIT I: Introduction to Nutrition-Entrepreneurship **9 Hours**

This unit will introduce the concept of nutrition entrepreneurship and apprise the students of the opportunities in the field

- Meaning, concept and scope of nutrition-entrepreneurship
- Food and nutrition start-up: trends, opportunities and challenges
- Start-up life cycle

UNIT II: Nutrition Based Enterprise **18 Hours**

This unit will impart knowledge regarding steps to be undertaken for setting up a nutrition based food business.

- Qualities/ traits of an entrepreneur
- Development of innovative nutritious products

- Computation of nutritive value of the product
- Development of business plan for a nutritious food
- Resource management

UNIT III: Guidelines for an Entrepreneurial Venture **18 Hours**

This unit will familiarize the students with Government of India's initiatives to promote entrepreneurship and necessary requirements to become nutrition-entrepreneur.

- Intellectual property rights
- Government schemes/ initiatives to support start-ups and promote entrepreneurship
- Food Safety Compliance System (FoSCoS) by FSSAI
- FSSAI guidelines for a food start-up

PRACTICAL
(Credit 1; Hours 30)

6. Planning of innovative nutrient rich products
7. Computation of nutritive value of the products and justifying their nutritional superiority in comparison to existing products
8. Formulation of a hypothetical business proposal for a funding agency
9. Advertising for the products planned
10. Preparation of food product acceptance checklist

ESSENTIAL/ RECOMMENDED READINGS

- Taneja, S. (2014). *Entrepreneur development*. Delhi: Himalaya Publishing House.
- FSSAI. *Food Safety Compliance System (FoSCoS).* https://foscos.fssai.gov.in. (Accessed on 10 March 2023).
- Start-up India. (2022). *Schemes.* Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, Government of India. https://www.startupindia.gov.in/content/sih/en/government-schemes.html (Accessed on 10 March 2023).
- FSSAI. *Guide for food start-ups.* https://fostac.fssai.gov.in/assets/docs/guide-for-food-startup.pdf (Accessed on 10 March 2023).
- FSSAI. *Food start-up in India – opportunities and challenges* https://www.fssai.gov.in/upload/media/FSSAI_News_Startup_FNB_26_02_2019.pdf. (Accessed on 10 March 2023).
- Sudheer, K. P., & Indira, V. (Eds.) (2022). *Entrepreneurship development in food processing.* New India Publishing Agency.

SUGGESTED READINGS

- Narayan, J., & Bala, P. (2016). *Start up your own restaurant.* Harper Collins.
- Green, K. (2017). *Recipe for success – the ingredients of a profitable food business.* Troubador Publishing Limited.

SEMESTER-V

B.A (Prog) with Nutrition and Health Education (NHE) as Major

Category-II

DISCIPLINE SPECIFIC CORE COURSE
DSC-9-NHE: Sports Nutrition

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title and Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical / Practice		
Sports Nutrition	4	3	0	1	XII Pass	NIL

Learning Objectives

- To impart knowledge and skills to students about Sports Nutrition
- To familiarise students with concepts of components of fitness and skills required for assessment and improvement of physical fitness
- To equip students with the concept and application skills with respect to nutrition for high performance sports through the life cycle and diet of sports persons

Learning Outcomes

After completion of the course students will be able to:

- Exhibit knowledge of the components of fitness and its assessment
- Successfully plan sport-specific diets
- Function effectively as a sports nutrition counsellor with knowledge and skills to support recreational and competitive sports**.**

SYLLABUS OF DSC-NHE-9

THEORY
(Credits 3; Hours 45)

UNIT I: Physical Fitness and Sports Nutrition **7 Hours**

This unit will introduce the student to physical fitness and sports nutrition.

- Definition and components of physical fitness
- Methods of assessing physical fitness
- Introduction to sports nutrition (Definition, importance, types of sports and introduction to terms like endurance, strength and power sports)
- Role of major nutrients in sports

UNIT II: Energy Systems and Fuel for Exercise and Sports 14 Hours

This unit will introduce the students with the energy systems, temperature regulation and fluid balance, symptoms and implications of dehydration in sports.

- Energy systems for physical activity and sports
- Fuel utilization for different sports
- Temperature regulation, fluid balance, fluid requirements of athletes and rehydration strategies for athletes

UNIT III: Nutritional Recommendations and Guidelines for Different Sports 14 Hours

This unit will introduce the students with Nutritional recommendations for athletes and sports.

- Nutritional recommendations and guidelines for different sports
- Nutrition for pre-competition, competition and post competition phase
- Supplements in sports-performance enhancing substances, drugs, ergogenic aids and herbs in sports
- Ethics and regulatory standards (doping and FSSAI regulation)

UNIT IV: Management of Nutrition Related Disorders in Sports 10 Hours

This unit will deal with weight management and eating disorders in sports.

- Approaches to weight management and body composition in sports
- Sports anaemia
- Management of eating disorders in sports persons
- Relative Energy Deficiency in sports (RED-S)

PRACTICAL
(Credit 1; Hours 30)

1. Planning a day's diet for an individual high-performance athlete (any one sport).
2. Planning a pre and post competition meal for endurance, ultra endurance, strength events, team events and sports drinks during and after an event.
3. Meal planning for Strength/Power sports activities.
4. Meal planning for Endurance sports activities.
5. Survey of sports nutritional supplements and study their labels (whey protein isolates).

ESSENTIAL/RECOMMENDED READINGS

- International Life Sciences Institute-India, National Institute of Nutrition, & Sports Authority of India. (2007). *Nutrition and hydration guidelines for excellence in sports performance.* http://ilsi-india.org/PDF/Nutrition_&_Hyd_Guidelines_for_Athletes_Final_report.pdf
- Wasuja, M. (2017). *Health education and sports nutrition.* Friend's Publication.
- Burke, L. M. & Deakin, V. (2002). *Clinical sports nutrition.* (2nd edn.). McGraw Hill Education.
- Chadha, R., & Mathur, P. (2015). *Nutrition: A lifecycle approach.* Elite Publishing House Pvt Ltd.

- Fink, H.H., Mikesky, A. E. & Burgoon, L.A. (2012). *Practical applications in sports Nutrition.* (3rd ed.). Jones and Bartlett Learning.
- Food Safety and Standards Authority of India (FSSAI), Government of India. http://www.fssai.gov.in/home/fss-legislation/food-safety-and-standards-act.html. (Accessed on 10 March 2023).
- National Anti-Doping Agency, Ministry of Youth Affairs and Sports, Government of India. https://www.nadaindia.org/. (Accessed on 10 March 2023).

SUGGESTED READINGS

- Mahan, L.K., & Escott-Stump, S. (2016). *Krause's food and nutrition therapy.* (14th edn.). Saunders-Elsevier.
- Agarwal. A., & Udipi, S. A. (2014). *Text book of human nutrition*. Jaypee Brothers Medical Publisher Ltd.
- Hickson, J. F., & Wolinksky, I. (1997*). Nutrition for exercise and sport.* (2nd edn.). CRC Press.

DISCIPLINE SPECIFIC CORE COURSE
DSC-NHE-10: Nutritional Approaches to Wellness and Longevity

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title and Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Nutritional Approaches to Wellness and Longevity	4	3	1	0	XII Pass	NIL

Learning Objectives

- To familiarize students with the concept of wellness and various diet related approaches for longevity
- To explain the significance of approaches other than diet for wellness and longevity
- To make students aware about various addictions and their relation to longevity

Learning Outcomes

After completion of the course, the students will be able to:

- Understand the several elements of health and wellness
- Describe approaches other than diet for wellness and longevity
- Gain knowledge about the linkage of longevity and wellness with different addictions

SYLLABUS OF DSC-NHE-10

THEORY
(Credits 3; Hours 45)

UNIT I: Relation between Disease, Health and Wellness 15 Hours

This unit will familiarize the students with the concept of wellness, health, their determinants and interaction.

- Definitions – longevity, wellness / wellbeing, standard of living, level of living, quality of life, physical quality of life index (PQLI), Human Development Index, Happiness Index
- Dimensions of wellness and health
- Determinants of health
- Epidemiologic concept of interactions of agent, host and environment
- Concept of prevention of illness
- Modes of intervention for combating illness

UNIT II: Diet Related Approaches for Longevity and Wellness 15 Hours

This unit will introduce the concept of various approaches related to diet for longevity and wellness in life.

- Nutritional screening
- Probiotics
- Prebiotics
- Antioxidants
- Immuno-nutrition
- Calorie restricted diets
- Chrono –nutrition
- Nutrigenomics
- Nutrigenetics

UNIT III: Adjuncts to Diet Therapy 8 Hours

This unit will introduce the approaches other than diet for wellness and longevity.

- Physical activity – types, benefits, tracking devices
- Yoga – benefits
- Circadian rhythm
- Psycho-social and mental health
- Stress management – meditation, pranayama, mind training

UNIT IV: Addictions and Longevity 7 Hours

This unit will acquaint the students with relation of addictions and longevity.

- Substance addiction
    - Smoking /Tobacco
    - Alcoholism
    - Drug abuse
- Non substance addiction
    - Overeating
    - Screen

TUTORIALS
(Credits 1; Hours 15)

Tutorial classes will involve:

1. Q&A sessions/ Group Discussions/ Problem Solving exercises with the Students
2. Presentation of project/ research activity by students
3. Any other scholastic work related to application of conceptual understanding of the subject
4. Evaluation and feedback by the teacher

ESSENTIAL/RECOMMENDED READINGS

- Park, K. (2021). *Park's textbook of preventive and social medicine* (26th ed.). Banarsidas Bhanot Publishers.
- Uppal, A.K., & Ranganathan, P.P. (2020). *Fitness, wellness and nutrition* (1st ed.). Friends Publication.
- Caterina, R.D., Martinez, J.A., & Kohlmeier, M. (Eds.). (2020). *Principles of nutrigenetics and nutrigenomics – fundamentals for individualized nutrition*. Academic Press.
- Zou, Z., Wang, H., Uquillas, F., Wang, X., Ding, J., & Chen H. (2017). Definition of substance and non-substance addiction. *Experimental Medicine and Biology*. 1010, DOI 10.1007/978-981-10-5562-1_2
- Chadha, R., & Mathur, P. (Eds). (2015). *Nutrition: A life cycle approach*. Orient Blackswan Private Limited.
- Swarbrick, P., & Yudof, J. (2015). *Wellness in eight dimensions.* Collaborative support programs of NJ.
- Joshi, Y.K. (Ed.). (2009). *Basics of Clinical Nutrition*. (2nd ed.). Jaypee Brothers Medical Publishers (P) Ltd.
- Harvard T.H. Chan School of Public Health. *The nutrition resource: healthy living guide 2022/2023.* https://www.hsph.harvard.edu/nutritionsource/2023/01/04/healthy-living-guide-2022-2023/ (Accessed on 10 March 2023).
- Harvard T.H. Chan School of Public Health. *The nutrition resource – stress and health.* https://www.hsph.harvard.edu/nutritionsource/stress-and-health/ (Accessed on 10 March 2023).

SUGGESTED READINGS

- Meiliana, A. & Wijaya, A. (2020). Nutrigenetics, nutrigenomics and precise nutrition. *Indonesian Biomedical Journal, 12*(3), 189–200.
- Savini, I., Gasperi, V., & Catani, V.M. (2016). *Nutrigenetics.* John Wiley & Sons Ltd. 10.1002/9780470015902.a0021028.
- Reen, J.K., Yadav, A.K., & Singh, J. (2015). Nutrigenomics: concepts, advances and applications. *Asian Journal of Dairy & Food Research, 34*(3), 205–212.
- Harvard T.H. Chan School of Public Health. The nutrition resource: nutrition and immunity. https://www.hsph.harvard.edu/nutritionsource/nutrition-and-immunity/

(Accessed on 10 March 2023).

- Harvard T.H. Chan School of Public Health. *The nutrition resource – sleep*. https://www.hsph.harvard.edu/nutritionsource/sleep/ (Accessed on 10 March 2023).
- Harvard T.H. Chan School of Public Health. *The nutrition resource – staying active.* https://www.hsph.harvard.edu/nutritionsource/staying-active/ (Accessed on 10 March 2023).
- Harvard T.H. Chan School of Public Health. (2011). *The nutrition resource – happiness and health.* https://www.hsph.harvard.edu/news/magazine/happiness-stress-heart-disease/ (Accessed on 10 March 2023).
- Harvard T.H. Chan School of Public Health. *The nutrition resource – healthy longevity.* https://www.hsph.harvard.edu/nutritionsource/healthy-longevity/(Accessed on 10 March 2023).

B.A (Prog.) with Nutrition and Health Education (NHE) as Non-Major

Category-III

DISCIPLINE SPECIFIC CORE COURSE
DSC-NHE-10: Nutritional Approaches to Wellness and Longevity

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title and Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Nutritional Approaches to Wellness and Longevity	4	3	1	0	XII Pass	NIL

Learning Objectives

- To familiarize students with the concept of wellness and various diet related approaches for longevity
- To explain the significance of approaches other than diet for wellness and longevity
- To make students aware about various addictions and their relation to longevity

Learning Outcomes

After completion of the course, the students will be able to:

- Understand the several elements of health and wellness
- Describe approaches other than diet for wellness and longevity
- Gain knowledge about the linkage of longevity and wellness with different addictions

SYLLABUS OF DSC-NHE-10

THEORY
(Credits 3; Hours 45)

UNIT I: Relation between Disease, Health and Wellness **15 Hours**

This unit will familiarize the students with the concept of wellness, health, their determinants and interaction.

- Definitions – longevity, wellness / wellbeing, standard of living, level of living, quality of life, physical quality of life index (PQLI), Human Development Index, Happiness Index
- Dimensions of wellness and health
- Determinants of health
- Epidemiologic concept of interactions of agent, host and environment
- Concept of prevention of illness
- Modes of intervention for combating illness

UNIT II: Diet Related Approaches for Longevity and Wellness 15 Hours

This unit will introduce the concept of various approaches related to diet for longevity and wellness in life.

- Nutritional screening
- Probiotics
- Prebiotics
- Antioxidants
- Immuno-nutrition
- Calorie restricted diets
- Chrono –nutrition
- Nutrigenomics
- Nutrigenetics

UNIT III: Adjuncts to Diet Therapy 8 Hours

This unit will introduce the approaches other than diet for wellness and longevity.

- Physical activity – types, benefits, tracking devices
- Yoga – benefits
- Circadian rhythm
- Psycho-social and mental health
- Stress management – meditation, pranayama, mind training

UNIT IV: Addictions and Longevity 7 Hours

This unit will acquaint the students with relation of addictions and longevity.

- Substance addiction
    - Smoking /Tobacco
    - Alcoholism
    - Drug abuse
- Non substance addiction
    - Overeating
    - Screen

TUTORIALS
(Credits 1; Hours 15)

Tutorial classes will involve:

1. Q&A sessions/ Group Discussions/ Problem Solving exercises with the Students
2. Presentation of project/ research activity by students
3. Any other scholastic work related to application of conceptual understanding of the subject
4. Evaluation and feedback by the teacher

ESSENTIAL/RECOMMENDED READINGS

- Park, K. (2021). *Park's textbook of preventive and social medicine* (26th ed.). Banarsidas Bhanot Publishers.

- Uppal, A.K., & Ranganathan, P.P. (2020). *Fitness, wellness and nutrition* (1st ed.). Friends Publication.
- Caterina, R.D., Martinez, J.A., & Kohlmeier, M. (Eds.). (2020). *Principles of nutrigenetics and nutrigenomics – fundamentals for individualized nutrition*. Academic Press.
- Zou, Z., Wang, H., Uquillas, F., Wang, X., Ding, J., & Chen H. (2017). Definition of substance and non-substance addiction. *Experimental Medicine and Biology*. 1010, DOI 10.1007/978-981-10-5562-1_2
- Chadha, R., & Mathur, P. (Eds). (2015). *Nutrition: A life cycle approach*. Orient Blackswan Private Limited.
- Swarbrick, P., & Yudof, J. (2015). *Wellness in eight dimensions.* Collaborative support programs of NJ.
- Joshi, Y.K. (Ed.). (2009). *Basics of Clinical Nutrition*. (2nd ed.). Jaypee Brothers Medical Publishers (P) Ltd.
- Harvard T.H. Chan School of Public Health. *The nutrition resource: healthy living guide 2022/2023.* https://www.hsph.harvard.edu/nutritionsource/2023/01/04/healthy-living-guide-2022-2023/ (Accessed on 10 March 2023).
- Harvard T.H. Chan School of Public Health. *The nutrition resource – stress and health.* https://www.hsph.harvard.edu/nutritionsource/stress-and-health/ (Accessed on 10 March 2023).

SUGGESTED READINGS

- Meiliana, A. & Wijaya, A. (2020). Nutrigenetics, nutrigenomics and precise nutrition. *Indonesian Biomedical Journal, 12*(3), 189–200.
- Savini, I., Gasperi, V., & Catani, V.M. (2016). *Nutrigenetics.* John Wiley & Sons Ltd. 10.1002/9780470015902.a0021028.
- Reen, J.K., Yadav, A.K., & Singh, J. (2015). Nutrigenomics: concepts, advances and applications. *Asian Journal of Dairy & Food Research, 34*(3), 205–212.
- Harvard T.H. Chan School of Public Health. The nutrition resource: nutrition and immunity. https://www.hsph.harvard.edu/nutritionsource/nutrition-and-immunity/ (Accessed on 10 March 2023).
- Harvard T.H. Chan School of Public Health. *The nutrition resource – sleep*. https://www.hsph.harvard.edu/nutritionsource/sleep/ (Accessed on 10 March 2023).
- Harvard T.H. Chan School of Public Health. *The nutrition resource – staying active.* https://www.hsph.harvard.edu/nutritionsource/staying-active/ (Accessed on 10 March 2023).
- Harvard T.H. Chan School of Public Health. (2011). *The nutrition resource – happiness and health.* https://www.hsph.harvard.edu/news/magazine/happiness-stress-heart-disease/ (Accessed on 10 March 2023).
- Harvard T.H. Chan School of Public Health. *The nutrition resource – healthy longevity.* https://www.hsph.harvard.edu/nutritionsource/healthy-longevity/(Accessed on 10 March 2023).

Pool of Discipline Specific Elective Course (DSE) for Odd Semester

B.A (Prog.) with Nutrition and Health Education (NHE)
Category-V

DISCIPLINE SPECIFIC ELECTIVE COURSE
DSE-NHE 1: Basic Physiology of Digestive System

CREDIT DISTRIBUTION, ELIGIBILITY AND PREREQUISITES OF THE COURSE

Course Title and Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Basic Physiology of Digestive System	4	3	1	0	XII Pass	NIL

Learning Objectives

- To impart knowledge about the basic structure of human digestive system.
- To explain the functioning of the human digestive system.
- To provide overview of the various disorders in relation with human digestive system.

Learning Outcomes

After completion of the course, the students will be able to:

- Understand the fundamentals of the human digestive system.
- Develop insight of functioning of the digestive system in the human body.
- Understand overview of the various diseases of human digestive system.

SYLLABUS OF DSE-NHE-1

THEORY
(Credits 3; Hours 45)

UNIT I: Fundamentals of Human Digestive System **10 Hours**

The unit explains the concept of the gross positioning and basic functioning of digestive system. It also imparts understanding about the contribution of different organ systems in relation to the digestive system.

- Overview of the gross structural positioning of digestive system in human body
- Contributions of different systems of human body in relation to the digestive system
- Functions of digestive system: ingestion, propulsion, digestion, absorption, and elimination
- Digestion and absorption of carbohydrates, fats, and proteins

UNIT II: Physiology of Gastrointestinal Tract (GIT) of Human Digestive System 18 Hours

This unit presents an understanding of the gross structure and functions of alimentary canal of digestive system and their correlation with specific disease conditions.

- Gross structure and functions of Gastro Intestinal Tract (GIT): mouth, pharynx, oesophagus, stomach, small intestine, large intestine, rectum and anal canal
- An overview of the diseases in correlation with alimentary canal/GIT: gastro oesophageal reflux disease (GERD), peptic ulcers, diarrhoea, constipation, irritable bowel syndrome etc.

UNIT III: Physiology of Accessory Organs of Human Digestive System 17 Hours

The unit presents an understanding of structure and functions of accessory organs of the digestive system and their correlation with specific disease conditions.

- Gross structure and functions of accessory organs of digestive system: teeth, tongue, salivary glands, liver, gallbladder, pancreas
- An overview of the diseases in correlation with accessory organs of digestive system: hepatitis, Non-alcoholic Fatty Liver Disease (NAFLD), liver cirrhosis, cholelithiasis, pancreatitis, diabetes etc.

TUTORIALS
(Credits 1; Hours 15)

Tutorial classes will involve:

1. Q&A sessions/ Group Discussions/ Problem Solving exercises with the Students
2. Presentation of project/ research activity by students
3. Any other scholastic work related to application of conceptual understanding of the subject
4. Evaluation and feedback by the teacher

ESSENTIAL/ RECOMMENDED READINGS

- Jain, A. K. (2019). *Human Physiology for BDS.* (6th edn.). Avichal Publishing Company.
- Singh, H. D. (2010). *Handbook of basic human physiology for paramedical students*. S. Chand Publishing.
- *Manav evan igyan evum yog*, M.Y-104. Uttrakhand Mukt Vishwa Vidyalaya https://uou.ac.in/sites/default/files/slm/MY-104.pdf (Accessed on 10 March 2023).

SUGGESTED READINGS

- Ross., & Wilson. (2018). *Anatomy and Physiology in Health and Illness* (13th edn.). Elsevier.
- Chaudhari, S. K. (2016). *Concise Medical Physiology* (7th edn.). New Central Book Agency (P) Ltd.
- *Manav sharir -rachna aur kriya- vigyan*, paper- 4 of PGDIPP, SIGFA Solutions http://assets.vmou.ac.in/PGDIPP04.pdf (Accessed on 10 March 2023).

B.A (Prog.) with Nutrition and Health Education (NHE)
Category-V

DISCIPLINE SPECIFIC ELECTIVE COURSE
DSE-NHE-3: Recent Advances in Food and Nutrition

CREDIT DISTRIBUTION, ELIGIBILTY AND PREREQUISITES OF THE COURSE

Course Title and Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Recent advances in food and nutrition	4	3	1	0	XII Pass	Nil

Learning Objectives

- To introduce students with the advances in food trends to fulfill developing health requirements.
- To equip them with knowledge of various recent advances in technologies in nutrition and food science.

Learning Outcomes

After completion of the course, the students will be able to:

- Develop understanding of modern approach to types of diet, and advancement in high altitude and space foods.
- Understand the multidisciplinary approaches in enrichment of nutrition.
- Understand and explore technologies involved in preparation and preservation of processed and convenience foods.
- Understand and explore different advanced methods of processing, preservation and packaging materials.

SYLLABUS OF DSE-NHE-3

THEORY
(Credits 3; Hours 45)

UNIT I: Recent Advances in Food for Health **12 Hours**

This unit will introduce diets and specified foods in order to attain desired health status by individuals

- Dietary approaches: Intermittent fasting, veganism, mediterranean diet, detox diet, gluten free diet, paleo diet, ketogenic diet, atkins diet, circadian rhythms diet.
- Recent advances with respect to functional foods, organic foods, nutraceuticals, dietary supplements, nutrigenomics, nutrigenetics, prebiotics, probiotics, synbiotics, postbiotics, high altitude and space foods.

UNIT II: Advanced Technologies to Enrich Nutrition **10 Hours**

This unit will explain the multidisciplinary approach in enrichment of nutrition.

- Food fortification
- Food biotechnology: role, application and concerns for the following:
  - Genetically modified foods
  - Biofortification
- WHO guidelines for fortified foods
- FSSAI regulations/standards for fortified foods

UNIT III: Technological Advancement in Food Processing 15 Hours

This unit will introduce different technologies involved in preparation and preservation of processed and convenience foods.

- Concept, application, advantages and disadvantages of the following techniques /technologies:
  - Extrusion technology
  - Microencapsulation
  - Nanotechnology
  - Ohmic heating
  - High-power ultrasound (HPU)
  - Electrohydrodynamic drying
  - Pulsed electric field (PEF)
  - Manothermosonication
  - High-pressure processing (HPP)
  - Food printing

UNIT IV: Advances in Food Packaging 8 Hours

This unit will introduce the advancement in different methods of food packaging.

- Sustainable food packaging: edible packaging, bioplastics
- Controlled atmosphere packaging (CAP) and Modified atmosphere packaging (MAP)
- Active, smart and intelligent packaging

TUTORIALS
(Credits 1; Hours 15)

Tutorial classes will involve:

1. Q&A sessions/ Group Discussions/ Problem Solving exercises with the Students
2. Presentation of project/ research activity by students
3. Any other scholastic work related to application of conceptual understanding of the subject
4. Evaluation and feedback by the teacher

ESSENTIAL/ RECOMMENDED READINGS

- Srilakshmi, B. (2022). *Food Science* (7th edition). New Age International (P) Ltd.
- Fellows, P. J. (2022). *Food processing technology: Principles and Practice* (5th edn.). Woodhead publishing.
- Anjana, A., & Shobha, A. U. (2021). *Textbook of human nutrition* (3rd edn.). Jaypee Brothers medical publishers.
- Rahman, M. S. (Ed.). (2007). *Handbook of Food Preservation*. (2nd edn.). CRC press.

SUGGESTED READINGS

- Suvendu, B. (Ed.). (2015). *Conventional and advanced food processing technologies.* Wiley Publishing.
- Bhesh, B., Fernanda, C. G., Min, Z., Sangeeta, P. (Eds.). (2019). *Fundamentals of 3D food printing and applications.* Academic press.
- Kit L.Y., & Dong S.L. (2012). *Emerging food packaging technologies: Principles and practice.* Woodhead publishing ltd.
- Sharvari, R., Sudiksha, H., Salil, M. & Ramesh, B. (2021). *Advancements in space food processing technologies. International Journal of Recent Scientific Research, 12*(06): 42033–42037.
- Food Safety and Standards Authority of India. (2018). *Food Safety and Standards (Fortification of Foods) Regulations.* https://www.fssai.gov.in/upload/uploadfiles/files/Compendium_Food_Fortification_Regulations_30_09_2021.pdf (Accessed on 10 March 2023).
- World Health Organization. (2006). *Guidelines on food fortification with micronutrients.* https://www.who.int/publications/i/item/9241594012 (Accessed on 10 March 2023).

B.A (Prog.) with Nutrition and Health Education (NHE)
Category-V

DISCIPLINE SPECIFIC ELECTIVE COURSE
DSE-NHE-5: Health and Nutrition for Women and Children

CREDIT DISTRIBUTION, ELIGIBILTY AND PREREQUISITES OF THE COURSE

Course Title and Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Health and Nutrition for Women and Children	4	3	0	1	XII Pass	NIL

Learning Objectives

- To sensitize students towards the current scenario with respect to health and nutrition indicators for women and children
- To impart holistic knowledge about health and nutrition issues concerning women
- To educate students about various aspects of child health and nutrition including IYCF, immunization as well as problems of malnutrition
- To create awareness regarding Government of India's ongoing programmes for nutrition and health of women and children

Learning Outcomes

After completion of the course, the students will be able to:

- Understand the various dimensions of women's health and nutrition
- Explain every aspect of children's health and nutrition including breast feeding, complementary feeding, immunization and nutrition related problems
- Gain sufficient knowledge to be able to contribute to the efforts made by the government towards promoting health and nutrition of women and children

SYLLABUS OF DSE-NHE-5

THEORY
(Credits 3; Hours 45)

UNIT I: Health and Nutrition for Non-pregnant, Non-lactating Women 12 Hours

This unit will familiarize the student with the current scenario and knowledge regarding nutrition and care for non-pregnant, non-lactating women.

- Nutrition situation of women in India
- Vital statistics related to health
- Importance of optimal nutrition for healthy life
- Nutritional concerns

UNIT II: Pregnancy and Lactation 12 Hours

This unit will address issues related to various aspects of health and nutrition of pregnant and lactating mothers.

- Health and nutritional considerations
- Factors affecting pregnancy outcomes and lactation performance
- Immunization/ vaccination during pregnancy
- Nutritional problems and their management

UNIT III: Infancy and Childhood 12 Hours

This unit will introduce all aspects of nutrition as well as other dimensions of child health.

- IYCF guidelines, first 1000 days
- Importance of appropriate nutrition during childhood
- Immunization: Universal Immunization programme, Intensified Mission Indradhanush 4.0
- Growth monitoring
- Malnutrition – Wasting, stunting and micronutrient deficiencies among children
  – Childhood obesity
- Diarrhoea

UNIT IV: Women and Child Nutrition Programmes: 9 Hours

This unit will give a complete overview of the government's flagship programme 'Poshan Abhiyan' and other programmes to improve nutritional outcomes for women and children

- Poshan Abhiyan

- Aanganwadi services
- Pradhanmantri Surakshit Matritva Abhiyan
- Anemia mukt bharat
- Janani-Shishu Suraksha Karyakram
- Rashtriya Bal Swasthya Karyakram

PRACTICAL
(Credit 1; 30 Hours)

1. Development of questionnaire/ presentation on health and nutritional problems in NPNL women
2. Planning and preparing an educational aid on the following suggested topics:
    - adequate care and nutrition during pregnancy/ lactation
    - dietary management of anemia during pregnancy
    - breastfeeding
    - complementary feeding
    - importance and schedule of immunization
3. Plotting and interpreting growth charts
4. Demonstrate age-specific complimentary food preparation
5. Preparation of information card about Poshan Abhiyan activities

ESSENTIAL/ RECOMMENDED READINGS

- Bamji, M. S., Rao, N. P., Reddy, V. (2017). *Textbook of Human Nutrition.* (4th edn.). Oxford and IBH Publishing Co. Pvt Ltd.
- Ministry of health and family welfare, Government of India. (2018). *Journey of the first 1000 days.* https://nhm.gov.in/images/pdf/programmes/RBSK/Resource_Documents/Journey_of_The_First_1000_Days.pdf (Accessed on 10 March 2023).
- Ministry of health and family welfare, Government of India. *Infant and Young Child Feeding* (2016) https://www.nhm.gov.in/MAA/One_Day_Sensitization_Module/One_Day_Sensitization_Module_English_lowres.pdf (Accessed on 10 March 2023).
- Ministry of health and family welfare, Government of India. *National Family Health Survey 5 (NFHS-5)* (2021) https://main.mohfw.gov.in/sites/default/files/NFHS-5_Phase-II_0.pdf (Accessed 10 March 2023).
- Ministry of health and family welfare, Government of India. *Intensified Mission Indradhanush* (2018) https://nhm.gov.in/New_Updates_2018/NHM_Components/Immunization/Guildelines_for_immunization/Mission_Indradhanush_Guidelines.pdf (Accessed 10 March 2023).
- *Poshan Abhiyan: Prime Minister's Over-reaching Scheme for Holistic Nourishment* https://www.india.gov.in/spotlight/poshan-abhiyaan-pms-overarching-scheme-holistic-nourishment. 22 October 2018 (Accessed on 10 March 2023).

SUGGESTED READINGS

- Chadha, R., Mathur, P. (2015). *Nutrition: A life cycle approach*. Orient Blackswan.
- Agarwal, A., & Udipi, S. A. (2022). *Textbook of Human Nutrition* (2nd edn.). Jaypee Brothers (P) Ltd.
- *Poshan Abhiyan: Prime Minister's Over-reaching Scheme for Holistic Nourishment. PIB* press release doc202112111.pdf (pib.gov.in) (Accessed on 10 March 2023).
- UNICEF. *Women's Nutrition*. https://www.unicef.org/india/what-we-do/womens-nutrition (Accessed on 10 March 2023).

Pool of Discipline Specific Elective Course (DSE) for Even Semester

B.A (Prog.) with Nutrition and Health Education (NHE)

Category-V

DISCIPLINE SPECIFIC ELECTIVE COURSE

DSE-NHE 2: Nutritional and Lifestyle Counselling

CREDIT DISTRIBUTION, ELIGIBILITY AND PREREQUISITES OF THE COURSE

Course Title and Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Nutritional and lifestyle counselling	4	3	0	1	XII Pass	NIL

Learning Objectives

- To introduce students to the concept of nutrition counselling, nutrition care process and responsibilities of a nutrition counsellor
- To acquaint the students with the WHO's 5A brief interventions for behaviour change counselling
- To familiarize the students with nutrition and lifestyle counselling for prevention and management of lifestyle related disorders/diseases

Learning Outcomes

After completion of the course, the students will be able to:

- Prepare and maintain a nutrition and lifestyle counselling case record
- Incorporate the WHO's 5A brief interventions for behaviour change counselling
- Gain knowledge for becoming an effective counsellor to lead a healthy lifestyle
-

SYLLABUS OF DSE-NHE-2

THEORY

(Credits 3; Hours 45)

UNIT I: Introduction to Counselling **8 Hours**

This unit will introduce the concept of counselling, it's stages and will acquaint the students to prepare a counselling case record.

- Basics of counselling; difference between education and counselling
- Counselling skills
- Stages of counselling
- Counsellors' role at different levels

- Counselling case record

UNIT II: Nutrition Counselling **17 Hours**

This unit will help the students to understand the concept of nutrition counselling and it's importance in nutrition care process, responsibilities of a nutrition counsellor and theories that influence them.

- Concept and objectives
- Nutrition care process
- Importance of nutrition counselling in the nutrition care process
- Responsibilities and role of nutrition counsellor
- Theories influencing nutrition counsellor

UNIT III: Nutrition and Lifestyle Counselling **20 Hours**

This unit will familiarize the students to the concept of lifestyle counselling, it's significance; WHO's 5As brief interventions for behaviour change counselling; nutrition and lifestyle counselling for lifestyle related disorders diseases

- Lifestyle counselling – concept and significance
- Understanding behaviour change
- Counselling for behaviour change through WHO's 5As (Ask, Advise, Assess, Assist, Arrange) brief interventions – healthy diet, increase in physical activity, quit tobacco and harmful use of alcohol
- Nutrition and lifestyle counselling for lifestyle related disorders/diseases
    - Types; risk factors (modifiable and non-modifiable risk factors)
    - Signs and symptoms of lifestyle diseases/disorders
    - Prevention and management of lifestyle diseases/disorders
        - Healthy and unhealthy diet
        - Diet and linkage with other risk factors
        - Diet and lifestyle diseases/disorders
        - Role of counsellor to promote healthy dietary practices, physical activity, reduce risk from indoor air pollution, in helping individuals experiencing stress and related disorders

PRACTICAL
(Credit 1; Hours 30)

1. Prepare a counselling case record for a healthy lifestyle and for any lifestyle related disease/disorder
2. Design information flyer/leaflet for risk factors of lifestyle related diseases/disorders OR do's and don'ts to maintain a healthy lifestyle
3. Create a power-point presentation showcasing signs/symptoms, prevention and management of lifestyle related diseases/disorders
4. Conduct 24-hour dietary recall for college going student of one working day, one non-working day and counsel accordingly for leading a healthy lifestyle
5. Conduct a case study using WHO's 5As (Ask, Advise, Assess, Assist, Arrange)

brief interventions on any two – healthy diet, increase in physical activity, quit tobacco and harmful use of alcohol

ESSENTIAL/ RECOMMENDED READINGS

- Snetselaar, L. (2009). *Nutrition Counseling Skills for the Nutrition Care Process* (4th edn.). Jones and Bartlett Publishers.
- National programme for prevention and control of cancer, diabetes, cardiovascular diseases and stroke (NPCDCS) handbook for counsellors - Reducing risk factors for noncommunicable diseases. Directorate General of Health Services Ministry of Health and Family Welfare, Government of India. Developed by National Institute of Mental Health and Neuro Sciences (NIMHANS) in collaboration with World Health Organization India (2017) https://main.mohfw.gov.in/sites/default/files/Handbook%20for%20Counsellors%20-%20Reducing%20Risk%20Factors%20for%20NCDs_1.pdf (Accessed on 10 March 2023).
- *Counselling and educating the patient*. https://gyansanchay.csjmu.ac.in/wp-content/uploads/2022/08/COUNSELLING-AND-EDUCATING-THE-PATIENT.pdf
  WHO (2018). *HEARTS Technical package for cardiovascular disease management in primary health care - Healthy-lifestyle counselling* https://apps.who.int/iris/bitstream/handle/10665/260422/WHO-NMH-NVI-18.1-eng.pdf (Accessed on 10 March 2023).
  https://samples.jblearning.com/0763729604/snetselaar_4e_ch1.pdf
- Raymond, J.L, Morrow, K. (2020). *Krause and Mahan's Food and the Nutrition Care Process.* (15th edn.). Elsevier Publications.

SUGGESTED READINGS:

- Mudambi, S.R., Rajagopal, M.V. (2007). *Fundamentals of Foods, Nutrition and Diet Therapy*. New Age International Publishers, Delhi.
- Oikarinen, A., Engblom, J., Paukkonen, L., Kääriäinen, M., Kaakinen, P., & Kähkönen, O. (2023). Effects of a lifestyle counselling intervention on adherence to lifestyle changes 7 years after stroke - A quasi-experimental study. Scandinavian Journal of Caring Sciences, 37(1), 163–172.
- Lonnberg, L. (2022). Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Medicine 1849. Acta Universitatis Upsaliensis Uppsala. https://uu.diva-portal.org/smash/get/diva2:1657438/FULLTEXT01.pdf.

B.A (Prog.) with Nutrition and Health Education (NHE)

Category-V

DISCIPLINE SPECIFIC ELECTIVE COURSE

DSE-NHE 4: Indigenous Indian Foods

CREDIT DISTRIBUTION, ELIGIBILITY AND PREREQUISITES OF THE COURSE

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Indigenous Indian Foods	4	3	1	0	XII Pass	NIL

Learning Objectives

- To impart knowledge about history of indigenous Indian foods
- To provide overview of the traditional foods evolved from indigenous foods
- To equip students with knowledge of traditional Indian functional foods
- To familiarize students with utilization of indigenous and traditional food as medicines

Learning Outcomes

After completion of the course, the students will be able to:

- Understand the history of indigenous Indian foods.
- Explain concept of traditional food evolving from indigenous foods.
- Learn about the health benefits of traditional foods as functional food.
- Understand the concept of utilization of indigenous and traditional food as medicines.

SYLLABUS FOR DSE-NHE-4

THEORY
(Credits 3; Hours 45)

UNIT I: Indian Food Culture, Indigenous Foods and Traditional Foods 8 Hours

The unit presents students with an introduction about Indian cookery, indigenous Indian foods, traditional Indian foods and history of evolution of food culture in India.

- History of Indian cookery.
- Overview of evolution of Indian food culture from ancient era to present time.
- Introduction to concept of indigenous Indian foods and traditional Indian foods.

UNIT II Indigenous foods of India 7 Hours

The unit will focus on different indigenous foods of indigenous Indian communities and also help the students to learn through case studies of select indigenous communities.

- Ancestral legacies (pre-ancient history, Indus valley and Harrapan spreads)
- Indigenous foods of indigenous communities
- Case study of select indigenous communities

UNIT III Traditional Functional Foods of India 15 Hours

The unit acquaints the students with an understanding about traditional Indian functional foods.

- Evolution of traditional functional foods
- Traditional Indian functional foods based on:
    - Whole grains
    - Legumes and legume adjuncts (*wadi, papad* etc.)
    - Milk and its products (*dahi, ghee* etc.)
    - Spices, salt, and condiments
    - Oils and oilseeds
    - Fruits and vegetables
    - Betel leaf
    - Herbs
    - Traditional Indian food as provider of abundant fibre
    - Traditional Indian food as provider of abundant polyphenols

UNIT IV Traditional Food as Medicine 15 Hours

The unit will focus on various aspects of ayurveda and traditional foods which can be utilized as medicine.

- Introduction to vedic nutrition (ayurvedic nutrition) concept incorporating indigenous and traditional foods as medicine**.**
- Ayurvedic triad (*sushruta, charaka, aryabhatta*)
- Tridosha (*vata, pitta, kapha*)
- Rasas (sweet, salty, sour, bitter, pungent, astringent)
- Hot and cold foods
- Kacha and pucca food
- Gunas of food (*rajsik, tamsik, satvik*)
- Incompatible foods (*virudh ahaar*): *pathya, apathya, viprit*
- Ayurvedic rules of food consumption

TUTORIALS
(Credits 1; Hours 15)

Tutorial classes will involve:

1. Q&A sessions/ Group Discussions/ Problem Solving exercises with the Students
2. Presentation of project/ research activity by students
3. Any other scholastic work related to application of conceptual understanding of the subject
4. Evaluation and feedback by the teacher

ESSENTIAL/ RECOMMENDED READINGS

- Achaya, K. T. (1994). *Indian Food: A Historical Companion.* Oxford University Press
- Srinivasan, K. (2010). Traditional Indian functional foods. In *Functional foods of the east* (pp. 51–84). https://doi.org/10.1201/b10264-4.
- Wickramasinghe, P. (2007). *The Food of India*. Om Books Service.
- Rastogi, S. (Ed.). (2014). *Ayurvedic science of Food and Nutrition*. Springer Nature.
- Sen, C. T. (2016). *Feast and Fasts: A History of Food in India*. Reaktion Books Ltd.
- FAO and Alliance of Bioversity International and CIAT. (2021). *Indigenous Peoples' food systems: Insights on sustainability and resilience in the front line of climate change.* https://www.fao.org/3/cb5131en/cb5131en.pdf
- Ghosh-Jerath, S., Kapoor, R., Barman, S., Singh, G., Singh, A., Downs, S., & Fanzo. J. (2021). Traditional Food Environment and Factors Affecting Indigenous Food Consumption in Munda Tribal Community of Jharkhand, India. *Frontiers in nutrition, 7*, Article 600470. https://doi.org/10.3389/fnut.2020.600470

SUGGESTED READINGS

- Gosh-Jerath, S., Kapoor, R., & Sabharwal, M. (2022). Indigenous Foods of India: A Comprehensive Narrative Review of Nutritive Values, Antinutrient Content and Mineral Bioavailability of Traditional Foods Consumed by Indigenous Communities of India. Frontiers in sustainable food systems, 6, https://www.frontiersin.org/articles/10.3389/fsufs.2022.696228/full
- BHM 401T, *Introduction to Indian Cooking*, Uttrakhand Open University India (2005). https://www.uou.ac.in/sites/default/files/slm/BHM-401T.pdf
- Rai, R., & Nath, V. (2003). *The role of ethnic and indigenous people of india and their culture in the conservation of biodiversity.* ICFRE India. https://www.fao.org/3/xii/0186-a1.htm
- Negi, V. S., Pathak, R., Thakur, S., Joshi, R. K., Bhatt, I. D., & Rawal, R. S. (2021). Scoping the Need of Mainstreaming Indigenous Knowledge for Sustainable Use of Bioresources in the Indian Himalayan Region. *Environmental Management.* https://doi.org/10.1007/s00267-021-01510-w
- FAO. The role of ethnic and indigenous people of India and their culture in the conservation of biodiversity. https://www.fao.org/3/xii/0186-a1.htm.

B.A (Prog.) with Nutrition and Health Education (NHE)

Category-V

DISCIPLINE SPECIFIC ELECTIVE COURSE

DSE-NHE 6: Research Methods in Home Science

CREDIT DISTRIBUTION, ELIGIBILITY AND PREREQUISITES OF THE COURSE

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Research Methods in Home Science	4	3	0	1	XII Pass	NIL

Learning Objectives

- To provide students understandings about the basic concepts, approaches and methods in conducting Home Science research.
- To enable learners to appreciate and critique the nuances of designing a research study well.
- To sensitize students towards ethical concerns while conducting Home Science research.

Learning Outcomes

- Demonstrate knowledge of the scientific method, purpose and approaches to research in Home Science
- Compare and contrast quantitative and qualitative research approaches
- Explain different types of research design and their applicability in Home Science research
- Understand the key elements of a research process
- Explain ethical principles, issues and procedures

SYLLABUS OF DSE-NHE-6

THEORY

(Credits 3; Hours 45)

UNIT I: Research Purpose and Design **10 Hours**

This unit will deal with meaning and importance of research in various areas of Home Science. Exposure to different types of research designs and measurement in Home Science research would also be given.

- Meaning, purpose and significance of research
- Research as a scientific method
- Types of research
- Quantitative, Qualitative and mixed method approaches

- Research Designs –Experimental and Non-Experimental; Descriptive and Observational; Participatory research
- Internal and external validity of research design
- Variables, concepts and measurement in research
- Levels of measurement
- Units of analysis

UNIT II: Sampling and Research Tools and Techniques 15 Hours

This unit will introduce the student to the concept of sampling and methods used to draw sample from population using examples from Home Science discipline. Students would also learn about types of data, its collection and reliability and validity concerns.

- Role of sampling in research
- Sampling techniques and their applicability, Sample size and sampling error
- Types of data: Primary and Secondary
- Tools of data collection; types, construction and administration- Interview, Questionnaire, Observation, Focus group discussion and other methods
- Validity and reliability of data collection tools

UNIT III: The Research Process 15 Hours

This unit will elaborate upon the various steps involved in conducting and reporting researches in Home Science.

- Defining the problem, research questions, objectives, hypotheses
- Review of related literature and originality in writing
- Systematic research: concept and methodology
- Planning the research
- Identifying variables and constructing hypothesis
- Selecting appropriate research methodology and tools
- Data analysis: coding and tabulation
- Writing a research report: styles and formats
- Citation formats: in medical sciences, social sciences

UNIT IV: Values, Social Responsibility and Ethics in Research 5 Hours

This unit will apprise the students about ethical concerns while conducting and reporting research.

- Ethical principles guiding research: from inception to completion and publication of research
- Plagiarism and Academic integrity in research: plagiarism tools and software
- Ethical issues relating to research participants and the researcher
    - Rights, dignity, privacy and safety of participants

- Informed consent, confidentiality, anonymity of respondents, voluntary participation, harm avoidance

PRACTICAL

(Credits 1; Hours 30)

1. Data visualization
2. Levels of Measurement
3. Types of research designs
   a. Experimental and non-experimental; Descriptive and observational
   b. Qualitative, Quantitative and mixed method
4. Sampling techniques and sample size calculation
   a. Probability sampling method
   b. Non-Probability sampling methods
5. Tools of data collection- Interview schedule, questionnaire and FGD
   - Designing/ Construction
   - Preparation of tools for ethical review
   - Pilot testing/validity and reliability of the tool
6. Data collection and analysis process: conducting interviews, administering questionnaire
7. Coding and tabulation of data for analysis
8. Citation formats and Plagiarism
9. Reviewing a research paper from a specific area of specialization in Home Science

ESSENTIAL READINGS

- Kerlinger F. N. and Lee, H.B. (2017). *Foundations of Behavioral Research* 4th Ed. Harcourt College Publishers.
- Kothari, C. R. (2019). *Research Methodology: Methods and Techniques*. New Age International Pvt Ltd, New Delhi.
- Kothari, C. R. (2022). *Shodh Padhati* 1st Ed. New Age International Pvt Ltd, New Delhi.
- Kumar, R. (2019) Research Methodology: A Step-by-Step Guide for Beginners. 5th Ed. Sage Publications, New Delhi.

SUGGESTED READINGS

- Bernard, H. R. (2000). *Social research methods: Qualitative and quantitative approaches.* Thousand Oaks, CA.: Sage.
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches.* Thousand Oaks, CA: Sage Publications.
- Davis, A. M., Treadwell, D. (2019). Introducing Communication Research: Paths of Inquiry. United Kingdom: SAGE Publications.
- Flynn, J.Z., Foster, I.M. (2009). *Research Methods for the Fashion industry.* Fairchild

books, Bloomsbury publishing.

- Indian National Science Academy (INSA) (2019). *Ethics in Science Education, Research and Governance*. ISBN:978-81-939482-1-7. http://www.insaindia.res.in/pdf/EthicsBook.pdf
- Jacobsen, K. H. (2020). *Introduction to health research methods: A practical guide*. Jones & Bartlett Publishers.
- UGC (2021) *Academic Integrity and Research Quality*. New Delhi: UGC, Retrieved from https://www.ugc.ac.in/e-book/Academic%20and%20Research%20Book_WEB.pdf (Accessed on 10 March 2023).

Appendix-12
Resolution No. 27 {27-1 (27-1-1)}

INDEX

Department of Home Science
Semester – VI

B.A (Prog) with Nutrition and Health Education (NHE)

B.A (Prog.) with Nutrition and Health Education (NHE) as Major

Category-II

DISCIPLINE SPECIFIC CORE COURSE
DSC-NHE 11: Nutrition During Emergencies and Disaster Management

CREDIT DISTRIBUTION, ELIGIBILITY AND PREREQUISITES OF THE COURSE

Course Title and Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Nutrition during Emergencies and Disaster Management	4	3	1	0	XII Pass	NIL

Learning Objectives

- To acquaint the students about disasters resulting in emergency situations and associated nutritional concerns
- To familiarize the students with the knowledge of assessment and surveillance of nutritional status in emergency and disasters
- To equip the students with an understanding of the strategies for nutritional rehabilitation, relief and mitigation of emergency affected populations
- To impart knowledge regarding nutrition interventions and role of National/International agencies to tackle emergency situations

Learning Outcomes

After completion of the course, the students will be able to:

- Familiarize with different types of disasters and understand the nutritional concerns in emergency situations
- Assess various methods of nutritional status of the emergency affected populations
- Differentiate between general feeding programme and selective feeding programme
- Recognize the role of government, non-government bodies and international organisations in the management of nutrition in emergencies.
- Analyze and understand strategies for prevention and mitigation for the emergency affected populations

SYLLABUS OF DSC-11

THEORY
(Credits 3; Hours 45)

UNIT I: Disasters, Emergencies and Associated Nutritional Concerns 8 Hours

This unit will introduce different types of disasters, factors effecting management of disasters and emergencies; nutritional concerns among vulnerable groups.

- Concept and types of disasters (natural/manmade)
- Factors to be considered for management of disasters and emergencies
- Nutritional concerns during disaster and emergencies among vulnerable populations – causes of malnutrition, macro/micro nutrient deficiencies

UNIT II: Assessment and Surveillance of Nutritional Status in Emergency Affected Population 12 Hours

This unit will lay emphasis on assessment of nutritional status and food needs, food distribution strategies, nutrition monitoring and surveillance of emergency affected populations.

- Screening and assessment of nutritional status in emergency affected populations
- Assessment of food needs in emergency situations, identifying and reaching the vulnerable groups, food distribution strategies
- Nutrition monitoring and surveillance

UNIT III: Nutrition Relief, Rehabilitation and Mitigation Strategies 15 Hours

This unit will acquaint the students with various aspects of nutritional relief, nutritional rehabilitation and mitigation strategies.

- Targeting food aid – food rations for nutritional relief and rehabilitation (special/fortified foods, local foods in rehabilitation, packed food)
- Transportation of food during emergencies, food storage and preventing food spoilage
- Household food and nutrition security – post emergency
- Importance of nutrition in post-emergency situations
- Disaster prevention and mitigation strategies, warning systems
- Role of government and non-government organisations, nutritionists in relief, rehabilitation and mitigation

UNIT IV: Nutrition Interventions and Role of National/International Agencies to tackle Emergency Situations 10 Hours

This unit will acquaint the students about different feeding programmes as nutrition interventions and role of various authorities in managing nutrition in emergencies.

- General Feeding Programme
- Selective Feeding Programme
    - Supplementary feeding programme (blanket SFP: micronutrient interventions; and target SFP: Infant and Young Child Feeding – breastfeeding, age appropriate and safe complimentary feeding, interventions to treat undernutrition, MAM, SAM)
    - Therapeutic Feeding Programme

- Disaster Management Act 2005
- Disaster Management cell, the State Disaster Management Authority (SDMA) and the National Disaster Management Authority (NDMA) – structure and functions
- Role of FAO, WHO and UNICEF in the management of nutrition in major emergencies

TUTORIALS
(Credits 1; Hours 15)

Tutorial classes will involve:

1. Q&A sessions/ Group Discussions/ Problem Solving exercises with the Students
2. Presentation of project/ research activity by students
3. Any other scholastic work related to application of conceptual understanding of the subject
4. Evaluation and feedback by the teacher

ESSENTIAL/RECOMMENDED READINGS:

- Vir, S. C. (2011). *Public health nutrition in developing countries – volume II*. Woodhead Publishing.
- Woodruff, B. A., & Duffield, A. (2000). *Adolescents: Assessment of Nutritional Status in Emergency affected populations.* Special supplement UN ACC/SCN sub-committee on nutrition.
- WHO. (2000). *The management of nutrition in major emergencies.* https://www.who.int/publications/i/item/9241545208 (Accessed on 10 March 2023).
- UNICEF (2018). *Nutrition in emergencies. Saving lives today, strengthening systems for tomorrow*. https://www.unicef.org/media/97011/file/Nutrition-in-emergencies-Saving-Lives-Today-Strengthening-Systems-for-Tomorrow.pdf (Accessed on 10 March 2023).
- National Disaster Management Authority, Government of India. https://ndma.gov.in/
- WHO. *Nutrition in Emergencies. Planning, preparedness and management for development out of disaster*. https://apps.who.int/disasters/repo/13849_files/i/nutrition_in_emergencies_ppt.pdf (Accessed on 10 March 2023).
- FAO. *Nutrition in Post-Emergency and Rehabilitation Interventions*. https://www.fao.org/3/v5611e/V5611E03.htm (Accessed on 10 March 2023).

SUGGESTED READINGS:

- Singh, S. N. (2010). Nutrition in emergencies: Issues involved in ensuring proper nutrition in post-chemical, biological, radiological, and nuclear disaster. *Journal of Pharmacy and Bioallied Sciences*, *2*(3), 248–52.
- Gupta, H. K. (2003). *Disaster Management.* Indian National Science Academy. Orient Blackswan.
- United Nations World Food Programme (WFP). (2005). *Emergency Food Security Assessment Handbook.* (1st edn.).

DISCIPLINE SPECIFIC CORE COURSE
DSC-NHE-12: Preventive and Promotive Nutrition

CREDIT DISTRIBUTION, ELIGIBILTY AND PREREQUISITES OF THE COURSE

Course Title and Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Preventive and Promotive Nutrition	4	3	0	1	XII Pass	NIL

Learning Objectives

- To make students aware about the prevalence of chronic diseases and correlate it with food consumption pattern
- To explain the role of nutraceuticals and functional foods in prevention of chronic diseases and promotion of good health
- To familiarize with types of dietary supplements and their health benefits

Learning Outcomes

After completion of the course, the students will be able to:

- Understand the relation between food consumption pattern and prevalence of chronic disease
- Describe the types and health benefits of nutraceuticals and functional foods
- Gain knowledge about the types, health benefits and adverse effects of dietary supplements

SYLLABUS OF DSC-NHE-12

THEORY
(Credits 3; Hours 45)

UNIT I: Relation between Diet, Nutrition and Prevalence of Disease **7 Hours**

This unit will familiarize the students with the correlation of chronic diseases and food consumption pattern.

- Global burden of chronic diseases
- Food consumption patterns and trends
- Oxidative stress and free radicals-Basic concept, mechanism of free radical formation, biological effects of free radicals

UNIT II: Nutraceuticals and their Role in Prevention of Diseases and Promotion of Health **15 Hours**

This unit will introduce definition, classification and health benefits of nutraceuticals.

- Definition of nutraceuticals
- Classification of nutraceuticals on the basis of chemical structure and their health benefits
  - Phytochemicals- isoprenoids, polyphenolics, phytosterols
  - Carbohydrates and their derivatives

  - Lipids- conjugated linoleic acid, omega-3 fatty acids
  - Proteins and peptides
  - Vitamins
  - Minerals
  - Microbial
- FSSAI regulations of nutraceuticals

UNIT III: Functional Foods and their Role in Prevention of Diseases and Promotion of Health

15 Hours

This unit will introduce definition, types and health benefits of various functional foods.

- Definition of functional foods
- Types of functional foods and their health benefits
  - Cereal and cereal products
  - Milk and milk products
  - Egg
  - Oils
  - Meat and meat products
  - Herbs and spices
  - Fruits and vegetables
  - Beverages (tea, wine)
  - Fermented foods

UNIT IV: Dietary Supplements **8 Hours**

This unit will introduce definition, types, benefits and safety issues of dietary supplements.

- Definition of dietary supplements
- Types of dietary supplements- vitamins, minerals, protein and amino acids, essential fatty acids, natural products
- Benefits and safety issues

PRACTICAL
(Credit 1; 30 Hours)

1. Survey of available nutraceuticals/dietary supplement in the market.
2. Survey regarding the awareness of availability and health benefits of dietary supplements among college going students and high fat, salt or sugar foods (HFSS).
3. Design a label for nutraceutical food/dietary supplement
4. Development of teaching aids for creating awareness of preventive and promotive nutrition

ESSENTIAL/RECOMMENDED READINGS

- Bagchi, D., Preuss, H. G., & Swaroop, A. (Eds.). (2015). *Nutraceuticals and functional foods in human health and disease prevention*. CRC Press.
- Wildman, R. E. and Bruno, R.S. (2021). *Handbook of nutraceuticals and functional foods*. (3rd edn.). CRC press.
- Food safety and Standards Authority of India, Government of India

https://www.fssai.gov.in/upload/uploadfiles/files/Compendium_Nutra_29_09_2021.pdf (Accessed on 10 March 2023).

- World Health Organization. (2003). *Diet, nutrition, and the prevention of chronic diseases: report of a joint WHO/FAO expert consultation* (Vol. 916).

SUGGESTED READINGS

- Egbuna, C., & Dable-Tupas, G. (2020). Functional foods and nutraceuticals. *Springer Nature*, *1*, 1-632.
- Mahan, L. K., & Raymond, J. L. (2016). *Krause's Food & the nutrition care process, Iranian Edition E-Book*. Elsevier Health Sciences.
- Rani, V., & Yadav, U. C. (Eds.). (2018). *Functional food and human health*. Springer.
- Noomhorm, A., Ahmad, I., & Anal, A. K. (Eds.). (2014). *Functional foods and dietary supplements: processing effects and health benefits*. John Wiley & Sons.

B.A (Prog.) with Nutrition and Health Education (NHE) as Non-Major
Category-III

DISCIPLINE SPECIFIC CORE COURSE
DSC-12-NHE: Preventive and Promotive Nutrition

Course Title and Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Preventive and Promotive Nutrition	4	3	0	1	XII Pass	NIL

Learning Objectives

- To make students aware about the prevalence of chronic diseases and correlate it with food consumption pattern
- To explain the role of nutraceuticals and functional foods in prevention of chronic diseases and promotion of good health
- To familiarize with types of dietary supplements and their health benefits

Learning Outcomes

After completion of the course, the students will be able to:

- Understand the relation between food consumption pattern and prevalence of chronic disease
- Describe the types and health benefits of nutraceuticals and functional foods
- Gain knowledge about the types, health benefits and adverse effects of dietary supplements

SYLLABUS OF DSC-NHE-12

THEORY
(Credits 3; Hours 45)

UNIT I: Relation between Diet, Nutrition and Prevalence of Disease **7 Hours**

This unit will familiarize the students with the correlation of chronic diseases and food consumption pattern.

- Global burden of chronic diseases
- Food consumption patterns and trends
- Oxidative stress and free radicals-Basic concept, mechanism of free radical formation, biological effects of free radicals

UNIT II: Nutraceuticals and their Role in Prevention of Diseases and Promotion of Health **15 Hours**

This unit will introduce definition, classification and health benefits of nutraceuticals.

- Definition of nutraceuticals

- Classification of nutraceuticals on the basis of chemical structure and their health benefits
  - Phytochemicals- isoprenoids, polyphenolics, phytosterols
  - Carbohydrates and their derivatives
  - Lipids- conjugated linoleic acid, omega-3 fatty acids
  - Proteins and peptides
  - Vitamins
  - Minerals
  - Microbial
- FSSAI regulations of nutraceuticals

UNIT III: Functional Foods and their Role in Prevention of Diseases and Promotion of Health

15 Hours

This unit will introduce definition, types and health benefits of various functional foods.

- Definition of functional foods
- Types of functional foods and their health benefits
  - Cereal and cereal products
  - Milk and milk products
  - Egg
  - Oils
  - Meat and meat products
  - Herbs and spices
  - Fruits and vegetables
  - Beverages (tea, wine)
  - Fermented foods

UNIT IV: Dietary Supplements **8 Hours**

This unit will introduce definition, types, benefits and safety issues of dietary supplements.

- Definition of dietary supplements
- Types of dietary supplements- vitamins, minerals, protein and amino acids, essential fatty acids, natural products
- Benefits and safety issues

PRACTICAL
(Credit 1; 30 Hours)

5. Survey of available nutraceuticals/dietary supplement in the market.
6. Survey regarding the awareness of availability and health benefits of dietary supplements among college going students and high fat, salt or sugar foods (HFSS).
7. Design a label for nutraceutical food/dietary supplement
8. Development of teaching aids for creating awareness of preventive and promotive nutrition

ESSENTIAL/RECOMMENDED READINGS

- Bagchi, D., Preuss, H. G., & Swaroop, A. (Eds.). (2015). *Nutraceuticals and functional*

foods in human health and disease prevention. CRC Press.
- Wildman, R. E. and Bruno, R.S. (2021). *Handbook of nutraceuticals and functional foods*. (3rd edn.). CRC press.
- Food safety and Standards Authority of India, Government of India https://www.fssai.gov.in/upload/uploadfiles/files/Compendium_Nutra_29_09_2021.pdf (Accessed on 10 March 2023).
- World Health Organization. (2003). *Diet, nutrition, and the prevention of chronic diseases: report of a joint WHO/FAO expert consultation* (Vol. 916).

SUGGESTED READINGS

- Egbuna, C., & Dable-Tupas, G. (2020). Functional foods and nutraceuticals. *Springer Nature*, *1*, 1-632.
- Mahan, L. K., & Raymond, J. L. (2016). *Krause's Food & the nutrition care process, Iranian Edition E-Book*. Elsevier Health Sciences.
- Rani, V., & Yadav, U. C. (Eds.). (2018). *Functional food and human health*. Springer.
- Noomhorm, A., Ahmad, I., & Anal, A. K. (Eds.). (2014). *Functional foods and dietary supplements: processing effects and health benefits*. John Wiley & Sons.

UNIVERSITY OF DELHI

CNC-II/093/1/EC-1273/2025/15/
Dated: 26.06.2025

NOTIFICATION

Sub: Amendment to Ordinance V

(ECR 38-8 dated 17.01.2025)

Following addition be made to Appendix-II-A to the Ordinance V (2-A) of the Ordinances of the University;

Add the following:

The Syllabi of the following Programmes for Semester-VII and Semester-VIII under the Department of Home (Faculty of Science) based on Undergraduate Curriculum Framework 2022, are notified herewith for the information of all concerned:

1. BA (Prog.) Food Technology (**Appendix -1)**
2. B.A. Programme with Apparel Design & Construction (ADC) (**Appendix -2)**
3. B.A. (Prog.) with Human Development and Family Empowerment (**Appendix -3)**
4. B.A. (Prog.) with Nutrition and Health Education (NHE) (**Appendix -4)**
5. B.Sc. (Hons.) Home Science - Semester-VII (**Appendix -5)**
6. B.Sc. (Hons.) Home Science - Semester-VIII (**Appendix -6)**
7. B.Sc. (Prog.) Home Science – Semester-VII (**Appendix -7)**
8. B.Sc. (Prog.) Home Science – Semester-VIII (**Appendix -8)**
9. B.Sc. (Hons.) Food Technology – Semester-VII (**Appendix -9)**
10. B.Sc. (Hons.) Food Technology – Semester-VIII (**Appendix -10)**

26/6/25

REGISTRAR

Department of Home Science
BA (Prog) with Nutrition and Health Education (NHE)
For SEMESTER VII & VIII

B.A (Prog) with Nutrition and Health Education (NHE) as Major

Category-II

DISCIPLINE SPECIFIC CORE COURSE – DSC-13-NHE: PUBLIC HEALTH NUTRITION

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course &Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical / Practice		
Public Health Nutrition	4	3	NIL	1	Class XII	DSC-NHE- 2

LEARNING OBJECTIVES:

1. To explain the multidisciplinary nature, scope, and current concerns of public health nutrition and the role of nutritionists in healthcare systems.
2. To apprise the relevance of assessing nutritional status and the various tools/techniques for assessment of nutritional status.
3. To familiarize the students with the the prevalence, etiology, clinical features, prevention, and management of major nutritional deficiency diseases.
4. To equip students with the practical skills in nutritional assessment, low-cost meal planning, and analyzing food security through case studies.

LEARNING OUTCOMES:

After completion of the course students will be able to:

1. Define public health nutrition and understand its interdisciplinary approach.
2. Assess nutritional status using both direct and indirect methods.
3. Gain knowledge of the common nutritional deficiency diseases and their management.
4. Develop practical skills in conducting dietary assessments and planning nutrition interventions for at-risk populations.

SYLLABUS OF DSC-13

THEORY
(Credits 3: 45 Hours)

UNIT 1: Public Health Nutrition and Health Care Systems (10 Hours)

- This unit will emphasize the multidisciplinary approach to improving population health through nutrition. It will also explore the role of public health nutritionists, health determinants, dimensions and healthcare delivery systems across various levels.
- *Subtopics:*
  - Definition and multidisciplinary nature of public health nutrition
  - Significance and emerging concerns in public health nutrition
  - Role of public health nutritionist
  - Health – definition, dimensions, determinants and indicators
  - Health care delivery system

UNIT 2: Assessment of nutritional status (10 Hours)

- This unit will equip the students the various methods of assessing nutritional status, objectives and importance.

- *Subtopics:*
    - Objectives and importance of assessment of nutritional status of individual and population groups
    - Methods of Assessment of Nutritional status of Individual and Population groups
        - Direct methods: Anthropometric assessment, Biochemical and biophysical assessment, Clinical examination, Dietary Assessment
        - Indirect methods: Health and Morbidity Indicators, Vital Statistics, Ecological factors

UNIT 3: Nutritional Deficiency Diseases/Disorders **(15 Hours)**

- This unit will introduce the students with the causes, symptoms, management, prevention of the following nutritional deficiency diseases/disorders:
- *Subtopics:*
    - Protein Energy Malnutrition, Moderate Acute Malnutrition, Severe Acute Malnutrition
    - Micronutrient deficiencies (Vitamin A deficiency, Nutritional anaemia, Iodine deficiency disorders, Vitamin D deficiency, Zinc deficiency, Fluorosis)

UNIT 4: Food and Nutrition Security **(10 Hours)**

- This unit will explore the aspects of food and nutrition security, focusing on definitions, methods and challenges. It will also examine the National Programmes in this area.
- *Subtopics:*
    - Definitions, indicators, determinants and challenges
    - Methods for attaining food and nutrition security
    - National programmes for ensuring food and nutrition security

PRACTICAL
(Credit 1: 30 hours)

1. Assessment of nutritional status:

- Anthropometry (height, weight, BMI, middle upper arm circumference, hip circumference, waist circumference, waist hip ratio)
- Dietary Assessment methods
- Clinical examination

2. Planning and preparation of low cost nutritious snacks for vulnerable groups**:**

- Protein Energy Malnutrition
- Nutritional Anemia
- Vitamin A deficiency

3. Case Studies

- Analysis of food security in India vs. other countries
- Success stories from nutrition security programmes

ESSENTIAL/RECOMMENDED READINGS:

- Park, K. (2021). *Park's Textbook of Preventive and Social Medicine* (26th ed.). Banarasidas Bhanot Publishers.
- Vir, S. (2023). Child, adolescent and women nutrition in India: Public Policies, programme and progress. KW Publishers, Daryaganj,New Delhi, India.
- FAO. (2023). *The state of food security and nutrition in the world 2023: Transforming food systems for affordable healthy diets*. Food and Agriculture Organization of the United Nations. https://www.fao.org/publications/sofi/en/

- ICMR NIN. (2024). *Estimated Average Requirements and Recommended Dietary Allowances for Indians*. National Institute of Nutrition.

SUGGESTED READINGS:

- Bamji, M. S., Krishnaswamy, K. & Brahmam, G. N. V. (4 Eds.). (2019). Textbook of Human Nutrition (4th ed.). New Delhi, India: Oxford and IBH Publishing Co. Pvt. Ltd.
- World Health Organization (WHO). (2023). *Child Growth Standards*. https://www.who.int/tools/child-growth-standards/standards. Accessed Dec 2024
- National Health Mission (NHM). (2023). *Participant Manual FBCSA-Malnutrition*. https://www.nhm.gov.in/images/pdf/programmes/child-health/IECmaterials/PARTICIPANT-MANUAL_FBCSA-Malnutrition.pdf. Accessed Dec 2024.
- Smith, M., & Thompson, K. (2022). *Nutrition security: Ensuring healthy diets and sustainable food systems*. Global Nutrition Report. https://globalnutritionreport.org/
- International Institute for Population Sciences (IIPS), & ICF. (2020). *National Family Health Survey (NFHS-5), India 2019-20: Volume I: Key Findings*. International Institute for Population Sciences. https://rchiips.org/nfhs/NFHS-5_FCTS/India.pdf

B.A (Prog) with Nutrition and Health Education (NHE) as Major

Category-II

DISCIPLINE SPECIFIC CORE COURSE – DSC-14-NHE: THERAPEUTIC NUTRITION

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Therapeutic Nutrition	4	3	NIL	1	Class XII	NIL

LEARNING OBJECTIVES:

- To impart students' basic knowledge on the role of diet in various disease conditions
- To understand principle of diet therapy, modification of normal diet for therapeutic purposes, role of dietician
- To develop skills in planning and preparation of therapeutic diets for various conditions

LEARNING OUTCOMES:

After completion of the course, the students will be able to:

- Describe therapeutic adaptions of normal diet
- Create an understanding regarding etiology, clinical features, dietary and nutritional management of common diseases like febrile conditions, gastrointestinal disorders, food allergy etc.
- Understand the risk factors, complications and dietary management of lifestyle disorders like diabetes, hypertension, atherosclerosis and obesity.
- Conduct market survey of therapeutic items

SYLLABUS OF DSC-NHE-14

THEORY
(Credits: Hours)

UNIT I: Nutrition Care Process **(8 Hours)**

- This unit will focus on basics of nutrition care process, role of dietician, modification of normal diet into therapeutic diet and types of diets and special feeding methods.

- *Subtopics:*
    - Rationale for Nutrition Support
    - Organization of Nutrition Support Services (Role of Dietician)
    - Dietary Modifications and types of diet
    - Special Feeding Methods enteral, parenteral

UNIT II: Nutrition in Infection **(12 Hours)**

- This unit will focus on etiology, clinical features, metabolic changes and dietary management during infections and GI disorders.

- *Subtopics:*
    - Fever (Acute and Chronic)
    - HIV AIDS
    - Upper GIT-GERD, Peptic Ulcers
    - Intestinal-Diarrhea, Constipation, Inflammatory Bowel Disease
    - Liver-Hepatitis

UNIT III: Lifestyle Related Disorders **(15 Hours)**

- This unit will focus on etiology, clinical features, assessment methods, complications and nutritional management of various lifestyle related diseases.

- *Subtopics:*
    - Overweight / Obesity
    - Diabetes Mellitus
    - Hypertension
    - Metabolic Syndrome
    - Cardiovascular- Atherosclerosis, Hypercholesterolemia
    - Cancer

UNIT IV: Inborn Errors of Metabolism / Specialized Diets / Food Allergy **(10 Hours)**

- This unit will focus on etiology and dietary modifications in inborn errors of metabolism / food allergy / specialized diets.

- *Subtopics:*
    - Lactose Intolerance
    - Celiac Disease
    - Food Allergy
    - Ketogenic Diet
    - Purine Restricted Diet

PRACTICAL
(Credits 1: 30 Hours)

1. Market Survey of Therapeutic Foods
2. Planning of Therapeutic Diets
   - Normal Diet
   - Soft Diet
   - Clear Fluid Diet
   - Full Fluid Diet
3. Develop a Questionnaire regarding basic information of patients for dietary management
4. Planning and preparation for the full day's diet for the following conditions: -
   - Fevers – Acute and Chronic
   - Chronic Diarrhea
   - Constipation
   - Obesity
   - Diabetes
5. Planning and preparation of snack/dish for following diseases: -
   - Typhoid/Tuberculosis
   - Diabetes – Sweet and Savory Snack
   - Hypertension
   - Obesity
   - Diarrhea
6. Develop a handout/visual material for any one of the following: -
   - Diarrhea
   - Lactose Intolerance/Celiac Disease
   - Diabetes
   - Hypertension
   - Obesity
   - Metabolic Syndrome

ESSENTIAL/ RECOMMENDED READINGS (Theory and Practical):

- Khanna, K, Gupta, S, Passi, S.J, Seth, R, Mahana, R, Puri, S (2013). Textbook of Nutrition and Dietetics (2nd Edition). Elite Publishing House Pvt. Ltd.
- Srilakshmi, B (2023) (9th Edition). Dietetics. New Age International (P) Ltd Publishers.
- Seth, V and Singh, K (2013). Diet Planning Through the Life Cycle, Part III. 'Diet Therapy' A Practical Manual, 5th Ed. Elite Publishing House Pvt/ Ltd.
- Siddhu, A , Bhatia, N , Singh, K , Gupta, S. Technical Series 6-Compliation of Food Exchange List (2017), Global Books Organization.
- Longvah, T, Anathen, R, Bhaskaracharya, K, Venkaiah, K. Indian Food Composition Tables, National Institute of Nutrition (2017)

SUGGESTED READINGS:

- Shubhargini, A, Joshi, S (2021). Nutrition and Dietetics (5th Edition), McGraw Hill Education (India)

Pvt. Ltd.

- Mudambi , S.R, Rajagopal , M.V. Fundamentals of Foods, Nutrition and Diet Therapy (2012). New Age International (P) Ltd. Publisher.
- Staci, Nix, William's Basic Nutrition and Diet Therapy (2021) South Asia Edition (16th Ed.) Elsevier.
- Raymond, J.L, Morrow, K, Krause and Mahan's Food and the Nutrition Care Process (16th Ed) (2022) Elsevier.
- Sharma, Avantina, Principles of Therapeutic Nutrition and Dietetics (2017), CBJ Publishers & Distributers.

Pool of Discipline Specific Elective Course (DSE) for Odd Semesters(Vth and VIIth)

B.A (Prog.) with Nutrition and Health Education (NHE)
Category-V

DISCIPLINE SPECIFIC ELECTIVE COURSE
DSE-NHE 1: Basic Physiology of Digestive System

CREDIT DISTRIBUTION, ELIGIBILITY AND PREREQUISITES OF THE COURSE

Course Title and Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Basic Physiology of Digestive System	4	3	1	0	XII Pass	NIL

Learning Objectives

- To impart knowledge about the basic structure of human digestive system.
- To explain the functioning of the human digestive system.
- To provide overview of the various disorders in relation with human digestive system.

Learning Outcomes

After completion of the course, the students will be able to:

- Understand the fundamentals of the human digestive system.
- Develop insight of functioning of the digestive system in the human body.
- Understand overview of the various diseases of human digestive system.

SYLLABUS OF DSE-NHE-1

THEORY
(Credits 3; Hours 45)

UNIT I: Fundamentals of Human Digestive System **(10 Hours)**

This unit explains the concept of the gross positioning and basic functioning of digestive system. It also imparts understanding about the contribution of different organ systems in relation to the digestive system.

- Overview of the gross structural positioning of digestive system in human body
- Contributions of different systems of human body in relation to the digestive system
- Functions of digestive system: ingestion, propulsion, digestion, absorption, and elimination
- Digestion and absorption of carbohydrates, fats, and proteins

UNIT II: Physiology of Gastrointestinal Tract (GIT) of Human Digestive System 14 Hours

This unit presents an understanding of the gross structure and functions of alimentary canal of digestive system and their correlation with specific disease conditions.

- Gross structure and functions of Gastro Intestinal Tract (GIT): mouth, pharynx, oesophagus, stomach, small intestine, large intestine, rectum and anal canal

UNIT III: Physiology of Accessory Organs of Human Digestive System (12 Hours)

This unit presents an understanding of structure and functions of accessory organs of the digestive system.

- Gross structure and functions of accessory organs of digestive system: teeth, tongue, salivary glands, liver, gallbladder, pancreas.

Unit IV Specific Disease Conditions in Correlation with Human Digestive System (9 Hours)

The unit presents an understanding of specific disease conditions in correlation with human digestive system.

- An overview of the diseases in correlation with alimentary canal/GIT: gastro oesophageal reflux disease (GERD), peptic ulcers, diarrhoea, constipation, irritable bowel syndrome etc.
- An overview of the diseases in correlation with accessory organs of digestive system: hepatitis, Non-alcoholic Fatty Liver Disease (NAFLD), liver cirrhosis, cholelithiasis, pancreatitis, diabetes etc.

TUTORIALS
(Credits 1; Hours 15)

Tutorial classes will involve:

1. Q&A sessions/ Group Discussions/ Problem Solving exercises with the Students
2. Presentation of project/ research activity by students
3. Any other scholastic work related to application of conceptual understanding of the subject
4. Evaluation and feedback by the teacher

ESSENTIAL/ RECOMMENDED READINGS

- Jain, A. K. (2019). *Human Physiology for BDS.* (6th edn.). Avichal Publishing Company.
- Singh, H. D. (2010). *Handbook of basic human physiology for paramedical students*. S. Chand Publishing.
- *Manav evan igyan evum yog*, M.Y-104. Uttrakhand Mukt Vishwa Vidyalaya https://uou.ac.in/sites/default/files/slm/MY-104.pdf (Accessed on 10 March 2023).

SUGGESTED READINGS

- Ross., & Wilson. (2018). *Anatomy and Physiology in Health and Illness* (13th edn.). Elsevier.
- Chaudhari, S. K. (2016). *Concise Medical Physiology* (7th edn.). New Central Book Agency (P) Ltd.
- *Manav sharir -rachna aur kriya- vigyan*, paper- 4 of PGDIPP, SIGFA Solutions http://assets.vmou.ac.in/PGDIPP04.pdf (Accessed on 10 March 2023).

B.A (Prog.) with Nutrition and Health Education (NHE)
Category-V

DISCIPLINE SPECIFIC ELECTIVE COURSE
DSE-NHE-3: Recent Advances in Food and Nutrition

CREDIT DISTRIBUTION, ELIGIBILTY AND PREREQUISITES OF THE COURSE

Course Title and Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Recent advances in food and nutrition	4	3	1	0	XII Pass	Nil

Learning Objectives

- To introduce students with the advances in food trends to fulfill developing health requirements.
- To equip them with knowledge of various recent advances in technologies in nutrition and food science.

Learning Outcomes

After completion of the course, the students will be able to:

- Develop understanding of modern approach to types of diet, and advancement in high altitude and space foods.
- Understand the multidisciplinary approaches in enrichment of nutrition.
- Understand and explore technologies involved in preparation and preservation of processed and convenience foods.
- Understand and explore different advanced methods of processing, preservation and packaging materials.

SYLLABUS OF DSE-NHE-3

THEORY
(Credits 3; Hours 45)

UNIT I: Recent Advances in Food for Health **12 Hours**

This unit will introduce diets and specified foods in order to attain desired health status by individuals

- Dietary approaches: Intermittent fasting, veganism, mediterranean diet, detox diet, gluten free diet, paleo diet, ketogenic diet, atkins diet, circadian rhythms diet.
- Recent advances with respect to functional foods, organic foods, nutraceuticals, dietary supplements, nutrigenomics, nutrigenetics, prebiotics, probiotics, synbiotics, postbiotics, high altitude and space foods.

UNIT II: Advanced Technologies to Enrich Nutrition **10 Hours**

This unit will explain the multidisciplinary approach in enrichment of nutrition.

- Food fortification
- Food biotechnology: role, application and concerns for the following:
  - Genetically modified foods
  - Biofortification
- WHO guidelines for fortified foods
- FSSAI regulations/standards for fortified foods

UNIT III: Technological Advancement in Food Processing **15 Hours**

This unit will introduce different technologies involved in preparation and preservation of processed and convenience foods.

- Concept, application, advantages and disadvantages of the following techniques /technologies:
  - Extrusion technology
  - Microencapsulation
  - Nanotechnology
  - Ohmic heating
  - High-power ultrasound (HPU)
  - Electrohydrodynamic drying
  - Pulsed electric field (PEF)
  - Manothermosonication
  - High-pressure processing (HPP)
  - Food printing

UNIT IV: Advances in Food Packaging **8 Hours**

This unit will introduce the advancement in different methods of food packaging.

- Sustainable food packaging: edible packaging, bioplastics
- Controlled atmosphere packaging (CAP) and Modified atmosphere packaging (MAP)
- Active, smart and intelligent packaging

TUTORIALS
(Credits 1; Hours 15)

Tutorial classes will involve:

1. Q&A sessions/ Group Discussions/ Problem Solving exercises with the Students
2. Presentation of project/ research activity by students
3. Any other scholastic work related to application of conceptual understanding of the subject
4. Evaluation and feedback by the teacher

ESSENTIAL/ RECOMMENDED READINGS

- Srilakshmi, B. (2022). *Food Science* (7th edition). New Age International (P) Ltd.
- Fellows, P. J. (2022). *Food processing technology: Principles and Practice* (5th edn.). Woodhead publishing.
- Anjana, A., & Shobha, A. U. (2021). *Textbook of human nutrition* (3rd edn.). Jaypee Brothers medical publishers.
- Rahman, M. S. (Ed.). (2007). *Handbook of Food Preservation*. (2nd edn.). CRC press.

SUGGESTED READINGS

- Suvendu, B. (Ed.). (2015). *Conventional and advanced food processing technologies.* Wiley Publishing.
- Bhesh, B., Fernanda, C. G., Min, Z., Sangeeta, P. (Eds.). (2019). *Fundamentals of 3D food printing and applications.* Academic press.
- Kit L.Y., & Dong S.L. (2012). *Emerging food packaging technologies: Principles and practice.* Woodhead publishing ltd.
- Sharvari, R., Sudiksha, H., Salil, M. & Ramesh, B. (2021). *Advancements in space food processing technologies. International Journal of Recent Scientific Research, 12*(06): 42033–42037.
- Food Safety and Standards Authority of India. (2018). *Food Safety and Standards (Fortification of Foods) Regulations.* https://www.fssai.gov.in/upload/uploadfiles/files/Compendium_Food_Fortification_Regulations_30_09_2021.pdf (Accessed on 10 March 2023).
- World Health Organization. (2006). *Guidelines on food fortification with micronutrients.* https://www.who.int/publications/i/item/9241594012 (Accessed on 10 March 2023).

B.A (Prog.) with Nutrition and Health Education (NHE)
Category-V

DISCIPLINE SPECIFIC ELECTIVE COURSE
DSE-NHE-5: Health and Nutrition for Women and Children

CREDIT DISTRIBUTION, ELIGIBILTY AND PREREQUISITES OF THE COURSE

Course Title and Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Health and Nutrition for Women and Children	4	3	0	1	XII Pass	NIL

Learning Objectives

- To sensitize students towards the current scenario with respect to health and nutrition indicators for women and children
- To impart holistic knowledge about health and nutrition issues concerning women
- To educate students about various aspects of child health and nutrition including IYCF, immunization as well as problems of malnutrition
- To create awareness regarding Government of India's ongoing programmes for nutrition and health of women and children

Learning Outcomes

After completion of the course, the students will be able to:

- Understand the various dimensions of women's health and nutrition
- Explain every aspect of children's health and nutrition including breast feeding, complementary feeding, immunization and nutrition related problems
- Gain sufficient knowledge to be able to contribute to the efforts made by the government towards promoting health and nutrition of women and children

SYLLABUS OF DSE-NHE-5

THEORY
(Credits 3; Hours 45)

UNIT I: Health and Nutrition for Non-pregnant, Non-lactating Women **12 Hours**

This unit will familiarize the student with the current scenario and knowledge regarding nutrition and care for non-pregnant, non-lactating women.

- Nutrition situation of women in India
- Vital statistics related to health
- Importance of optimal nutrition for healthy life
- Nutritional concerns

UNIT II: Pregnancy and Lactation **12 Hours**

This unit will address issues related to various aspects of health and nutrition of pregnant and lactating mothers.

- Health and nutritional considerations
- Factors affecting pregnancy outcomes and lactation performance
- Immunization/ vaccination during pregnancy
- Nutritional problems and their management

UNIT III: Infancy and Childhood **12 Hours**

This unit will introduce all aspects of nutrition as well as other dimensions of child health.

- IYCF guidelines, first 1000 days
- Importance of appropriate nutrition during childhood
- Immunization: Universal Immunization programme, Intensified Mission Indradhanush 4.0
- Growth monitoring
- Malnutrition – Wasting, stunting and micronutrient deficiencies among children
  – Childhood obesity
- Diarrhoea

UNIT IV: Women and Child Nutrition Programmes: **9 Hours**

This unit will give a complete overview of the government's flagship programme 'Poshan Abhiyan' and other programmes to improve nutritional outcomes for women and children

- Poshan Abhiyan

- Aanganwadi services
- Pradhanmantri Surakshit Matritva Abhiyan
- Anemia mukt bharat
- Janani-Shishu Suraksha Karyakram
- Rashtriya Bal Swasthya Karyakram

PRACTICAL
(Credit 1; 30 Hours)

1. Development of questionnaire/ presentation on health and nutritional problems in NPNL women
2. Planning and preparing an educational aid on the following suggested topics:
    - adequate care and nutrition during pregnancy/ lactation
    - dietary management of anemia during pregnancy
    - breastfeeding
    - complementary feeding
    - importance and schedule of immunization
3. Plotting and interpreting growth charts
4. Demonstrate age-specific complimentary food preparation
5. Preparation of information card about Poshan Abhiyan activities

ESSENTIAL/ RECOMMENDED READINGS

- Bamji, M. S., Rao, N. P., Reddy, V. (2017). *Textbook of Human Nutrition.* (4th edn.). Oxford and IBH Publishing Co. Pvt Ltd.
- Ministry of health and family welfare, Government of India. (2018). *Journey of the first 1000 days.* https://nhm.gov.in/images/pdf/programmes/RBSK/Resource_Documents/Journey_of_The_First_1000_Days.pdf (Accessed on 10 March 2023).
- Ministry of health and family welfare, Government of India. *Infant and Young Child Feeding* (2016) https://www.nhm.gov.in/MAA/One_Day_Sensitization_Module/One_Day_Sensitization_Module_English_lowres.pdf (Accessed on 10 March 2023).
- Ministry of health and family welfare, Government of India. *National Family Health Survey 5 (NFHS-5)* (2021) https://main.mohfw.gov.in/sites/default/files/NFHS-5_Phase-II_0.pdf (Accessed 10 March 2023).
- Ministry of health and family welfare, Government of India. *Intensified Mission Indradhanush* (2018) https://nhm.gov.in/New_Updates_2018/NHM_Components/Immunization/Guildelines_for_immunization/Mission_Indradhanush_Guidelines.pdf (Accessed 10 March 2023).
- *Poshan Abhiyan: Prime Minister's Over-reaching Scheme for Holistic Nourishment* https://www.india.gov.in/spotlight/poshan-abhiyaan-pms-overarching-scheme-holistic-nourishment. 22 October 2018 (Accessed on 10 March 2023).

SUGGESTED READINGS

- Chadha, R., Mathur, P. (2015). *Nutrition: A life cycle approach*. Orient Blackswan.
- Agarwal, A., & Udipi, S. A. (2022). *Textbook of Human Nutrition* (2nd edn.). Jaypee Brothers (P) Ltd.
- *Poshan Abhiyan: Prime Minister's Over-reaching Scheme for Holistic Nourishment. PIB* press release doc202112111.pdf (pib.gov.in) (Accessed on 10 March 2023).
- UNICEF. *Women's Nutrition*. https://www.unicef.org/india/what-we-do/womens- nutrition (Accessed on 10 March 2023).

B.A (Prog) with Nutrition and Health Education (NHE)

Category-V

DISCIPLINE SPECIFIC ELECTIVE COURSE – DSE-NHE-7 : COMMUNICATION FOR HEALTHY FOOD PROMOTION

CREDIT DISTRIBUTION, ELIGIBILTY AND PREREQUISITES OF THE COURSE

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Communication for Healthy Food Promotion	4	3	1	-	Class XII	NIL

LEARNING OBJECTIVES:

1. To familiarize students with the concept of communication
2. To impart knowledge regarding the role of IEC in healthy food promotion
3. To build capacity of students for implementation and impact assessment of IEC in community and food industry

LEARNING OUTCOMES:

After completion of the course, the students will be able to:

1. Understand definition, functions, models and channels of communication
2. Explain the role of IEC materials in spreading nutrition awareness
3. Learn efforts made by governments towards promoting healthy food choices.

SYLLABUS OF DSE-NHE-7

THEORY
(Credits 3: 45 Hours)

UNIT 1: Concept of communication **(10 Hours)**

- This unit will introduce the meaning of communication and explain its concepts and characteristics in detail.
- *Subtopics:*

o Concepts of communication

a) Definition and functions

b) Models and scope

c) Communication process

d) Communication channels

e) Feedback in communication

UNIT 2: Communication methods and IEC based materials **(11 Hours)**

- This unit will explain the role of Information Education Communication (IEC) and Behaviour Change Communication (BCC) in healthy food promotion.
- *Subtopics:*

o Introduction to IEC and its importance

o Introduction to BCC and its importance

o Communication approaches and audio-visual aids

o Use of social media and mass media in healthy food promotion

UNIT 3: Changing trends in food choices **(12 Hours)**

- This unit will help follow the journey of changing patterns in food choices and the current attempts at developing healthy food behaviour
- *Subtopics:*

o Factors influencing food choices

-changes in socio-cultural environment

-changes in food environment

o Promoting healthy food choices

-social marketing techniques

-food labelling in India: health and nutrition claims

-developing healthy food choices among children

o Front of pack labelling around the world

UNIT 4: Government initiatives towards healthy food promotion: (12 Hours)

- *Unit Description:* This unit will familiarize students with initiatives taken by Government of India to promote healthful eating
- *Subtopics:*
  - Initiatives under FSSAI

    -Safe and nutritious food at workplace

    -Eat Right Movement

    -Calorie count of restaurant menus

    - Reducing trans fats in partially hydrogenated vegetable oils
  - Social and Behavioural Change Communication (SBCC) campaign under Poshan Abhiyan

TUTORIALS
(Credits 1; Hours 15)

Tutorial classes will involve:

1. Q&A sessions/ Group Discussions/ Problem Solving exercises with the students
2. Presentation of project/ research activity by students
3. Any other scholastic work related to application of conceptual understanding of the subject
4. Evaluation and feedback by the teacher

ESSENTIAL/RECOMMENDED READINGS:

- Park, K (2023). *Textbook of Textbook of Preventive and Social Medicine* (27th ed). Jabalpur, MP: Banarsidas Bhanot Publishers
- Supe SV (2015). *Textbook of Extension Education* (2nd ed). Udaipur, Rajasthan: Agrotech Publishing.
- Subbarao,MG. *Nutrition Communication-Rhetoric & Reality* (2019), Indian J Med Res. Online: https://pmc.ncbi.nlm.nih.gov/articles/PMC6607813/ (Accessed on 15th December 2024)
- FSSAI (2020). *Eat Right India Handbook* Online: https://fssai.gov.in/book-details.php?bkid=357 (Accessed on 15th December 2024)
- FSSAI (2018) *Your Guide to Safe and Nutritious Food at the Workplace* Online https://fssai.gov.in/book-details.php?bkid=149 (Accessed on 15th December 2024)

SUGGESTED READINGS:

- FSSAI (2022) Guidance note on Display of Information in Food Service Establishments https://fssai.gov.in/upload/uploadfiles/files/Guidance_Note_Labelling_23_02_2022.pdf (Accessed on 15th December 2024)
- FSSAI (2021) Another Step Towards India@75:Freedom from Trans Fats by 2022 https://fssai.gov.in/upload/press_release/2021/02/6023b317a99acPress_Release_Trans_Fat_10_02_2021.pdf
- Awareness on Malnutrition: Poshan Abhiyan (17th March 2023) https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1908010 (Accessed on 15th December 2024)
- Parker L, Burns AC, and Sanchez E (eds). (2009). *Local Government Actions to prevent Childhood Obesity*. Washington (DC): National Academies Press (US). https://www.ncbi.nlm.nih.gov/books/NBK219692/ (Accessed on 15th December 2024)

- Workshop summary (2016). *Food Literacy: How do Communication and Marketing Impact Consumer Knowledge, Skills and Behaviour*. Washington (DC): National Academies Press (US). https://www.ncbi.nlm.nih.gov/books/NBK367596/ (Accessed on 15th December 2024)
- Halliday TA (2020). *Use of Information, Education, Communication (IEC)-Based Materials: An Effective Teaching-Learning Strategy in Nutrition Education.* International Journal of Research and Scientific Innovation 7(9), 350-354.
- Saha,S, Vemula SR, Gavaravarapu SR (2021). *Health and Nutrition Claims on Food Labels – Means of Communication That Can Influence Food Choices of Adolescents.* Journal of Content, Community and Nutrition. 13; 113-124
- Fitzgibbon, Marian et al. (2007) *Communicating Healthy Eating: Lessons Learned and Future Directions*. Journal of Nutrition Education and Behavior, 39(2), S63 - S71

B.A (Prog) with Nutrition and Health Education (NHE)

Category-V

DISCIPLINE SPECIFIC ELECTIVE COURSE – DSE-9-NHE: SUSTAINABLE FOOD SYSTEM

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
Sustainable Food System	4	3	1	NIL	Class XII	NIL

LEARNING OBJECTIVES:

- To develop understanding regarding various sustainable food systems
- To familiarize students about nutrition and food security issues
- To determine how to adopt / practice sustainability in the food system

LEARNING OUTCOMES:

After completion of the course, the students will be able to:

- Describe concept and importance of sustainable food system
- Determine pillars of sustainable food system

- Comprehend nutrition and food security, its challenges and outcomes
- Analyze and interpret Sustainable Development Goals (SDG)

SYLLABUS OF DSE-NHE-9

THEORY
(Credits: 45 Hours)

UNIT I: Sustainable Food System: Concept and Framework **(14 Hours)**

- This unit will focus on basics of sustainable food system, its pillars and concept of nutrition and food security

- *Subtopics:*
  - Introduction to sustainable food system
  - Concepts and Importance of sustainable food system
  - Pillars of sustainable food system and its interrelationship
  - Concept of Nutrition and Food Security

UNIT II: Characteristics of Sustainable Food System **(10 Hours)**

- This unit will focus on challenges of sustainable food system and progress to achieve nutrition and food security.

- *Subtopics:*
  - Outline of food industry and impact of biodiversity
  - Challenges of sustainable food system
  - Ways to achieve nutrition and food security

UNIT III: Approaches for Sustainability in Food System **(12 Hours)**

- This unit will focus on benefits of sustainable food system and Government initiatives.

- *Subtopics:*
  - Approaches for sustainable food system
    - Optimize Agricultural Land Use
    - Improve efficiency through supply chain
    - Understand impact of climate change
    - Shift to more sustainable diets
  - Action initiation by government

UNIT IV: Nourishing the Future **(9 Hours)**

- This unit will focus on SDG 2 for food sustainability and ways to achieve it and promote nutrition and food

security.

- *Subtopics:*
  - SDG 2 for food sustainability
  - Sustainable Food Production and Distribution
  - Future Goals and Ways to incorporate practices effectively
  - Promote Nutrition and Food Security

TUTORIAL
(Credits 1: 15 Hours)

Tutorial Classes will involve

1. Q & A Session / Group Discussion Exercise with the Students
2. Presentation of the Project / Research Activity by the Student
3. Any other Scholastic Work related to Application of Conceptual Understanding of the Subject
4. Evaluation and Feedback by the Teacher

ESSENTIAL/ RECOMMENDED READINGS:

- A Anjana; U.A. Shobha (2014); Textbook of Human Nutrition; Jaypee Brothers Medical Publishers (P) Ltd.
- M.S. Bamji, K.Kamla, Brahman G.N.V (2017) 4th Edition; Textbook of Human Nutrition; Oxford and IBM Publishing Co Pvt. Ltd.
- D Suryatapa (2020) 4th Edition; Textbook of Community Nutrition; Academic Publishers.
- Nutrition Action Plan on Food Security and Climate Change (2022) , Ministry of Health and Family Welfare.
- J. Shyma, G. Ashok, K. Kriti (2020); Achieving Nutritional Security in India: Vision 2030 NABARD Research Study-9; NABARD and ICRVER.

SUGGESTED READINGS:

- FAO. 2013. The State of Food and Agriculture 2013.
- Food losses and waste in the context of sustainable food systems. (2014)A report by the High-Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. Rome.
- Ingram, J. 2011. A food systems approach to researching food security and its interactions with global environmental change. Food Security, 3(4): 417–431.
- V Braun, J., Afsana, K., Fresco, L.O. et al. Food system concepts and definitions for science and political action. Nat Food 2, 748–750 (2021). https://doi.org/10.1038/s43016-021-00361-2+
- Thakur, Monica (2024). 1st Edition Sustainable Food System (Volume I): SFS, Framework, Sustainable Diets, Traditional Food Culture & Food Production (World Sustainability Series). Springer International Publishing AG. ISBN: 978-3031471216.
- M.Van Dijk, G.W. Meijerink (2014) A review of Food & Security scenario and assessment studies: Results, gaps and research priorities. Global Food Security (Accessed on 15.12.24) Elsevier.

- A Nandini, K Apoorve & W Aradhana (2023) A Report: How to Design Scalable and Sustainable Programmes ; Sustainable Food System, New Delhi : Council on Energy, Environment and Water.
- Supporting Zero Hunger SDG 2 – 5 Steps Approach (2023): Tracextech.com/zero hunger-sdg2
- Sporchia, F Antonelli, M; Aguliar-Martinez et al (2024) zero hunger; Future Challenges and the way forward towards the achievement of Sustainable Development Goal 2; Sustain Earth Review 7; (Accessed on 15.12.24) https://rdcu.be/d3Dq7

B.A (Prog.) with Nutrition and Health Education (NHE)

Category-V

DISCIPLINE SPECIFIC ELECTIVE COURSE
DSE-NHE-11: RESEARCH METHODS IN HOME SCIENCE
DSE HS 6-1: RESEARCH METHODS IN HOME SCIENCE

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical		
Research Methods in Home Science	**4**	**3**	**0**	**1**	XII Pass	NIL

Theory
45 Periods; Practical 30 Periods

Learning Objectives

1. To provide students understandings about the basic concepts, approaches and methods in conducting Home Science research.
2. To enable learners to appreciate and critique the nuances of designing a research study well.
3. To sensitize students towards ethical concerns while conducting Home Science research.

Learning Outcomes

1. Demonstrate knowledge of the scientific method, purpose and approaches to research in Home Science
2. Compare and contrast quantitative and qualitative research approaches
3. Explain different types of research design and their applicability in Home Science research
4. Understand the key elements of a research process
5. Explain ethical principles, issues and procedures

SYLLABUS OF DSE HS 6-1

THEORY
(Credits 3; Hours 45)

UNIT I: Research Purpose and Design **10 Hours**

This unit will deal with meaning and importance of research in various areas of Home Science. Exposure to different types of research designs and measurement in Home Science research would also be given.

- Meaning, purpose and significance of research
- Research as a scientific method
- Types of research
- Quantitative, Qualitative and mixed method approaches
- Research Designs –Experimental and Non-Experimental; Descriptive and Observational; Participatory research
- Internal and external validity of research design
- Variables, concepts and measurement in research
- Levels of measurement
- Units of analysis

UNIT II: Sampling and Research tools & techniques **15 Hours**

This unit will introduce the student to the concept of sampling and methods used to draw sample from population using examples from Home Science discipline. Students would also learn about types of data, its collection and reliability and validity concerns.

- Role of sampling in research
- Sampling techniques and their applicability, Sample size and sampling error
- Types of data: Primary and Secondary
- Tools of data collection; types, construction and administration- Interview, Questionnaire, Observation, Focus group discussion and other methods
- Validity and reliability of data collection tools

UNIT III: The Research Process **15 Hours**

This unit will elaborate upon the various steps involved in conducting and reporting researches in Home Science.

- Defining the problem, research questions, objectives, hypotheses
- Review of related literature and originality in writing
- Systematic research: concept and methodology
- Planning the research
- Identifying variables and constructing hypothesis
- Selecting appropriate research methodology and tools
- Data analysis: coding and tabulation
- Writing a research report: styles and formats
- Citation formats: in medical sciences, social sciences

UNIT IV: Values, Social Responsibility and Ethics in Research **5 Hours**

This unit will apprise the students about ethical concerns while conducting and reporting research.

- Ethical principles guiding research: from inception to completion and publication of research
- Plagiarism and Academic integrity in research: plagiarism tools and software
- Ethical issues relating to research participants and the researcher
    - Rights, dignity, privacy and safety of participants
    - Informed consent, confidentiality, anonymity of respondents, voluntary participation, harm avoidance

PRACTICAL
(Credits 1; Hours 30)

1. Data visualization
2. Levels of Measurement
3. Types of research designs
    a. Experimental and non-experimental; Descriptive and observational
    b. Qualitative, Quantitative and mixed method
4. Sampling techniques and sample size calculation
    a. Probability sampling method
    b. Non-Probability sampling methods
5. Tools of data collection- Interview schedule, questionnaire and FGD
    - Designing/ Construction
    - Preparation of tools for ethical review
    - Pilot testing/ validity and reliability of the tool\
6. Data collection and analysis process: conducting interviews, administering questionnaire
7. Coding and tabulation of data for analysis
8. Citation formats and Plagiarism
9. Reviewing a research paper from a specific area of specialization in Home Science

ESSENTIAL READINGS

- Kerlinger F. N. and Lee, H.B. (2017). *Foundations of Behavioral Research* 4th Ed. Harcourt College Publishers.

- Kothari, C. R. (2019). *Research Methodology: Methods and Techniques*. New Age International Pvt Ltd, New Delhi.
- Kothari, C. R. (2022). *Shodh Padhati* 1st Ed. New Age International Pvt Ltd, New Delhi.
- Kumar, R. (2019) Research Methodology: A Step-by-Step Guide for Beginners. 5th Ed. Sage Publications, New Delhi.

SUGGESTED READINGS

- Bernard, H. R. (2000). *Social research methods: Qualitative and quantitative approaches.* Thousand Oaks, CA.: Sage.
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches.* Thousand Oaks, CA: Sage Publications.
- Davis, A. M., Treadwell, D. (2019). Introducing Communication Research: Paths of Inquiry. United Kingdom: SAGE Publications.
- Flynn, J.Z., Foster, I.M. (2009). *Research Methods for the Fashion industry.* Fairchild books, Bloomsbury publishing.
- Indian National Science Academy (INSA) (2019). *Ethics in Science Education, Research and Governance*. ISBN:978-81-939482-1-7. http://www.insaindia.res.in/pdf/EthicsBook.pdf
- Jacobsen, K. H. (2020). *Introduction to health research methods: A practical guide*. Jones & Bartlett Publishers.
- UGC (2021) *Academic Integrity and Research Quality*. New Delhi: UGC, Retrieved from https://www.ugc.ac.in/e-book/Academic%20and%20Research%20Book_WEB.pdf

DISCIPLINE SPECIFIC ELECTIVE COURSE
DSE-NHE-13: DATA ANALYSIS AND STATISTICAL TOOLS

Credit Distribution, Eligibility and Pre-requisites of the Course

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Data Analysis and Statistical Tools	4	3	0	1	XII Pass	NIL

LEARNING OBJECTIVES

- To provide an understanding of the basic statistical concepts and methods.
- To enable learners to collect, organize, summarize and present data using tables, graphs, and statistical plots.

- To gain the ability to collate, analyse and interpret the results of datasets using basic statistical tools and techniques.

LEARNING OUTCOMES

After completing this course, the learner will be able to:

- Explain fundamental statistical concepts and tools relevant to basic research.
- Summarize and visualize data effectively using descriptive statistics and statistical plots.
- Apply inferential statistical techniques to draw meaningful conclusions from sample data.
- Interpret and communicate statistical findings in the context of research.

SYLLABUS OF DSE-NHE-13

THEORY
(Credits 3; Hours 45)

UNIT 1: Fundamentals of Statistics **10 Hours**

This unit establishes the foundational principles of statistics, focusing on its application in social sciences.

- Role and functions of statistics in social science and market research
- Types of Statistics: Descriptive and Inferential
- Types and Sources of Data
- Measurement Scales: Nominal, Ordinal, Interval, Ratio
- Importance of Reliability and Validity

UNIT II: Data Organization and Summarization **15 Hours**

This unit focuses on summarizing and visualizing data for analysis and interpretation.

- Organising data: frequency distribution tables
- Statistical graphs and visual interpretation: Histogram, Pie Chart, Bar Graph, Line Graph, Frequency Polygon, Ogive
- Measures of Central Tendency for ungrouped and grouped data: Mean, Median, Mode
- Measures of Dispersion for ungrouped and grouped data:
    - Absolute dispersion (Range, Quartile deviation, Mean deviation, Standard Deviation, Variance)
    - Relative dispersion (Coefficient of Range, Coefficient of Quartile deviation, Coefficient of Mean deviation, Coefficient of Variance)
- Measures of Shape: Skewness and Kurtosis
- Measures of partition values – Quartile, Decile, Percentile, Percentile Rank for ungrouped and grouped data

UNIT III: Basic Statistical Concepts and tools used in Experimental Research **10 Hours**

This unit introduces students to inferential tools and techniques used to explore relationships and trends in data.

- Basics of Probability: Concepts, laws of addition and multiplication
- Normal Distribution: Properties and application
- Correlation:
    - Karl Pearson's Coefficient
    - Spearman's Rank Correlation (Repeated and Non-Repeated)
- Linear regression (SLR)

UNIT IV: Hypothesis Testing and Statistical Analysis Techniques **10 Hours**

This unit equips students with inferential statistical methods for decision-making.

- Sampling and Testing Hypotheses:
  - Null and Alternative Hypotheses
  - Level of Significance (α) and Confidence Level (c)
  - One-tailed vs Two-tailed tests
  - Type I and Type II Errors
- Introduction to Parametric and Non-Parametric tests

PRACTICAL
(Credit 1; Hours 30)

1. **Introduction to Statistical Software**: Using spreadsheet application such as Excel for statistical analysis by inputting basic data and performing essential functions.

2. **Construction of Frequency Distributions**: Organize raw data into grouped and ungrouped frequency tables using a given dataset.

3. **Diagrammatic Representation of Data**: Visualize data using bar charts, pie charts, line graphs, histograms, and frequency polygons, and interpret the results for a given dataset.

4. **Measures of Central Tendency**: Calculate mean, median, and mode for grouped and ungrouped data in Excel, and compare central tendencies between two datasets.

5. **Measures of Dispersion**: Compute range, variance, and standard deviation in Excel to analyse the spread of two different datasets.

6. **Correlation Analysis**: Measure the strength of relationships between two variables by calculating Pearson's and Spearman's correlation coefficients.

7. **Hypothesis Testing (One-sample and Two-sample t-test)**: Test the significance of means for single, independent, and dependent datasets using t-tests.

8. **Chi-Square Test for Independence**: Test the independence between categorical variables by analysing and interpreting a contingency table.

Essential Readings

- Minium, E. W., King, B. M., & Bear, G. (2017). *Statistical Reasoning for Psychology and Education*. New York: Wiley and Sons.
- Gupta, S.P. (2022) *Statistical Methods*, 46th Edn. S. Chand and Sons.
- Agresti, A., Christine Franklin, C. and Klingenberg, B. (2017). *Statistics: The Art and Science of Learning from data*, Pearson, Boston

Suggested Readings

- Schmuller, J. (2016). *Statistical Analysis with Excel for Dummies*, 5th Edition,
- New York, USA.
- Gupta, S. C. and Kapoor, V. K. (2020). *Fundamentals of Mathematical Statistics*, 12th Edn., S. Chand and Sons.
- Ross, Sheldon M. (2010): *Introductory Statistics*, 3rd Edition, Academic Press.
- Derek Rowntree, (2018). *Statistics Without Tears, An Introduction for Non-Mathematicians*, Penguin Books

Pool of Discipline Specific Elective Course (DSE) for Even Semesters (VIth and VIIIth)

B.A (Prog.) with Nutrition and Health Education (NHE)

Category-V

DISCIPLINE SPECIFIC ELECTIVE COURSE – DSE-NHE 2: NUTRITIONAL AND LIFESTYLE COUNSELLING

Credit distribution, Eligibility and Prerequisites of the Course

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Nutritional and Lifestyle Counselling	4	3	-	1	-	NIL

LEARNING OBJECTIVES:

1. To introduce students to the concept of nutrition counselling, nutrition care process and responsibilities of a nutrition counsellor
2. To acquaint the students with the WHO's 5A brief interventions for behaviour change counselling
3. To familiarize the students with nutrition and lifestyle counselling for prevention and management of lifestyle related disorders/diseases

LEARNING OUTCOMES:

After completion of the course, the students will be able to:

1. Prepare and maintain a nutrition and lifestyle counselling case record
2. Incorporate the WHO's 5A brief interventions for behaviour change counselling
3. Gain knowledge for becoming an effective counsellor to lead a healthy lifestyle

SYLLABUS for DSE-NHE-2

THEORY
(Credits 3: 45 Hours)

UNIT 1: Introduction to Counselling

(8 Hours)

- This unit will introduce the concept of counselling, it's stages and will acquaint the students to prepare a counselling case record.
- *Subtopics:*
    - Basics of counselling; difference between education and counselling
    - Counselling skills
    - Stages of counselling
    - Counsellors' role at different levels
    - Counselling case record

UNIT 2: Nutrition Counselling

(17 Hours)

- This unit will help the students to understand the concept of nutrition counselling and it's importance in nutrition care process, responsibilities of a nutrition counsellor and theories that influence them.
- *Subtopics:*
    - Concept and objectives
    - Nutrition care process
    - Importance of nutrition counselling in the nutrition care process
    - Responsibilities and role of nutrition counsellor
    - Theories influencing nutrition counsellor

UNIT 3: Lifestyle Counselling and Behaviour Change **(10 Hours)**

- This unit introduces students to the foundational concepts and significance of lifestyle counselling. It emphasizes understanding behaviour change models, especially WHO's 5As framework for brief interventions, and their application in promoting healthy lifestyle choices including diet, physical activity, and substance cessation.
- *Subtopics:*
    - **Lifestyle counselling – concept and significance**
    - **Understanding behaviour change**
    - **Counselling for behaviour change using WHO's 5As (Ask, Advise, Assess, Assist, Arrange):**
        - Encouraging healthy diet
        - Promoting physical activity
        - Quitting tobacco
        - Reducing harmful use of alcohol

UNIT 4: Nutrition Counselling for Lifestyle Disorders and Diseases **(10 Hours)**

- This unit focuses on applying nutrition and lifestyle counselling in the context of lifestyle-related disorders. It covers disease types, risk factors, prevention, and management strategies, emphasizing the role of a counsellor in promoting diet-based and behavioural interventions.

Subtopics:

- **Lifestyle-related disorders/diseases:**
  - Types
  - Modifiable and non-modifiable risk factors
  - Signs and symptoms
- **Prevention and management of lifestyle diseases/disorders through:**
  - Healthy and unhealthy dietary patterns
  - Link between diet and other risk factors
  - Relationship between diet and lifestyle diseases/disorders
- **Role of counsellor in:**
  - Promoting healthy dietary practices and physical activity
  - Reducing risk from indoor air pollution
  - Supporting individuals experiencing stress and related disorders

PRACTICAL
(Credit 1: 30 Hours)

1. Prepare a counselling case record for a healthy lifestyle and for any lifestyle related disease/disorder
2. Design information flyer/leaflet for risk factors of lifestyle related diseases/disorders OR do's and don'ts to maintain a healthy lifestyle
3. Create a power-point presentation showcasing signs/symptoms, prevention and management of lifestyle related diseases/disorders
4. Conduct 24-hour dietary recall for college going student of one working day, one non-working day and counsel accordingly for leading a healthy lifestyle
5. Conduct a case study using WHO's 5As (Ask, Advise, Assess, Assist, Arrange) brief interventions on any two – healthy diet, increase in physical activity, quit tobacco and harmful use of alcohol

ESSENTIAL/RECOMMENDED READINGS:

- Snetselaar, L. (2009). *Nutrition Counseling Skills for the Nutrition Care Process* (4th edn.). Jones and Bartlett Publishers.
- National programme for prevention and control of cancer, diabetes, cardiovascular diseases and stroke (NPCDCS) handbook for counsellors - Reducing risk factors for noncommunicable diseases. Directorate General of Health Services Ministry of Health and Family Welfare, Government of India. Developed by National Institute of Mental Health and Neuro Sciences (NIMHANS) in collaboration with World Health Organization India (2017)
- https://main.mohfw.gov.in/sites/default/files/Handbook%20for%20Counsellors%20-%20Reducing%20Risk%20Factors%20for%20NCDs_1.pdf
- *Counselling and educating the patient.* https://gyansanchay.csjmu.ac.in/wp-content/uploads/2022/08/COUNSELLING-AND-EDUCATING-THE-PATIENT.pdf
- WHO (2018). *HEARTS Technical package for cardiovascular disease management in primary health care - Healthy-lifestyle counselling* https://apps.who.int/iris/bitstream/handle/10665/260422/WHO-NMH-NVI-18.1-eng.pdf https://samples.jblearning.com/0763729604/snetselaar_4e_ch1.pdf
- Raymond, J.L, Morrow, K. (2020). *Krause and Mahan's Food and the Nutrition Care Process.* (15th edn.). Elsevier Publications.

SUGGESTED READINGS:

- Mudambi, S.R., Rajagopal, M.V. (2007). *Fundamentals of Foods, Nutrition and Diet Therapy.* New Age International Publishers, Delhi.
- Oikarinen, A., Engblom, J., Paukkonen, L., Kääriäinen, M., Kaakinen, P., & Kähkönen, O. (2023). Effects of a lifestyle counselling intervention on adherence to lifestyle changes 7 years after stroke - A quasi-experimental study. Scandinavian Journal of Caring Sciences, 37(1), 163–172.
- Lonnberg, L. (2022). Digital Comprehensive Summaries of Uppsala Dissertations from the Faculty of Medicine 1849. Acta Universitatis Upsaliensis Uppsala. https://uu.diva-portal.org/smash/get/diva2:1657438/FULLTEXT01.pdf.

B.A (Prog.) with Nutrition and Health Education (NHE)

Category-V

DISCIPLINE SPECIFIC ELECTIVE COURSE – DSE-NHE 4: INDIGENOUS INDIAN FOODS

CREDIT DISTRIBUTION, ELIGIBILITY AND PREREQUISITES OF THE COURSE

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Indigenous Indian Foods	4	3	1	-	-	NIL

LEARNING OBJECTIVES:

1. To impart knowledge about history of indigenous Indian foods
2. To provide overview of the traditional foods evolved from indigenous foods
3. To equip students with knowledge of traditional Indian functional foods
4. To familiarize students with utilization of indigenous and traditional food as medicines

LEARNING OUTCOMES:

After completion of the course, the students will be able to:

1. Understand the history of indigenous Indian foods.
2. Explain concept of traditional food evolving from indigenous foods.
3. Learn about the health benefits of traditional foods as functional food.
3. Understand the concept of utilization of indigenous and traditional food as medicines.

SYLLABUS for DSE-NHE-4

THEORY

(Credits 3: 45 Hours)

UNIT I: Indian Food Culture, Indigenous Foods and Traditional Foods (8 Hours)

The unit presents students with an introduction about Indian cookery, indigenous Indian foods, traditional Indian foods and history of evolution of food culture in India.

Subtopics:

- History of Indian cookery.
- Overview of evolution of Indian food culture from ancient era to present time.
- Introduction to concept of indigenous Indian foods and traditional Indian foods.

UNIT II Indigenous foods of India (7 Hours)

The unit will focus on different indigenous foods of indigenous Indian communities and also help the students to learn through case studies of select indigenous communities.

Subtopics:

- Ancestral legacies (pre-ancient history, Indus valley and Harrapan spreads)
- Indigenous foods of indigenous communities
- Case study of select indigenous communities

UNIT III Traditional Functional Foods of India (15 Hours)

The unit acquaints the students with an understanding about traditional Indian functional foods.

Subtopics:

- Evolution of traditional functional foods
- Traditional Indian functional foods based on:
  - Whole grains
  - Legumes and legume adjuncts (*wadi, papad* etc.)
  - Milk and its products (*dahi, ghee* etc.)
  - Spices, salt, and condiments
  - Oils and oilseeds
  - Fruits and vegetables
  - Betel leaf
  - Herbs
  - Traditional Indian food as provider of abundant fibre
  - Traditional Indian food as provider of abundant polyphenols

UNIT IV Traditional Food as Medicine (15 Hours)

The unit will focus on various aspects of ayurveda and traditional foods which can be utilized as medicine.

Subtopics:

- Introduction to vedic nutrition (ayurvedic nutrition) concept incorporating indigenous and traditional foods as medicine.
- Ayurvedic triad (*sushruta, charaka, aryabhatta*)
- Tridosha (*vata, pitta, kapha*)
- Rasas (sweet, salty, sour, bitter, pungent, astringent)
- Hot and cold foods
- Kacha and pucca food
- Gunas of food (*rajsik, tamsik, satvik*)
- Incompatible foods (*virudh ahaar*): *pathya, apathya, viprit*
- Ayurvedic rules of food consumption

ESSENTIAL/RECOMMENDED READINGS:

- Achaya, K. T. (1994). *Indian Food: A Historical Companion.* Oxford University Press
- Srinivasan, K. (2010). Traditional Indian functional foods. In *Functional foods of the east* (pp. 51–84). https://doi.org/10.1201/b10264-4.
- Wickramasinghe, P. (2007). *The Food of India.* Om Books Service.
- Rastogi, S. (Ed.). (2014). *Ayurvedic science of Food and Nutrition.* Springer Nature.
- Sen, C. T. (2016). *Feast and Fasts: A History of Food in India.* Reaktion Books Ltd.
- FAO and Alliance of Bioversity International and CIAT. (2021). *Indigenous Peoples' food systems: Insights on sustainability and resilience in the front line of climate change.* https://www.fao.org/3/cb5131en/cb5131en.pdf
- Ghosh-Jerath, S., Kapoor, R., Barman, S., Singh, G., Singh, A., Downs, S., & Fanzo. J. (2021). Traditional Food Environment and Factors Affecting Indigenous Food Consumption in Munda Tribal Community of Jharkhand, India. *Frontiers in nutrition, 7,* Article 600470. https://doi.org/10.3389/fnut.2020.600470

SUGGESTED READINGS:

- Gosh-Jerath, S., Kapoor, R., & Sabharwal, M. (2022). Indigenous Foods of India: A Comprehensive Narrative Review of Nutritive Values, Antinutrient Content and Mineral Bioavailability of Traditional Foods Consumed by Indigenous Communities of India. Frontiers in sustainable food systems, 6, https://www.frontiersin.org/articles/10.3389/fsufs.2022.696228/full
- BHM 401T, *Introduction to Indian Cooking*, Uttrakhand Open University India (2005). https://www.uou.ac.in/sites/default/files/slm/BHM-401T.pdf
- Rai, R., & Nath, V. (2003). *The role of ethnic and indigenous people of india and their culture in the conservation of biodiversity.* ICFRE India. https://www.fao.org/3/xii/0186-a1.htm
- Negi, V. S., Pathak, R., Thakur, S., Joshi, R. K., Bhatt, I. D., & Rawal, R. S. (2021). Scoping the Need of Mainstreaming Indigenous Knowledge for Sustainable Use of Bioresources in the Indian Himalayan Region. *Environmental Management.* https://doi.org/10.1007/s00267-021-01510-w
- FAO. The role of ethnic and indigenous people of India and their culture in the conservation of biodiversity. https://www.fao.org/3/xii/0186-a1.htm.

Category-V

DISCIPLINE SPECIFIC ELECTIVE COURSE
DSE-NHE-6/11: RESEARCH METHODS IN HOME SCIENCE
DSE HS 6-1: RESEARCH METHODS IN HOME SCIENCE

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical		
Research Methods in Home Science	**4**	**3**	**0**	**1**	XII Pass	NIL

Theory
45 Periods; Practical 30 Periods

Learning Objectives

4. To provide students understandings about the basic concepts, approaches and methods in conducting Home Science research.
5. To enable learners to appreciate and critique the nuances of designing a research study well.
6. To sensitize students towards ethical concerns while conducting Home Science research.

Learning Outcomes

6. Demonstrate knowledge of the scientific method, purpose and approaches to research in Home Science
7. Compare and contrast quantitative and qualitative research approaches
8. Explain different types of research design and their applicability in Home Science research
9. Understand the key elements of a research process

10. Explain ethical principles, issues and procedures

SYLLABUS OF DSE HS 6-1

THEORY
(Credits 3; Hours 45)

UNIT I: Research Purpose and Design **10 Hours**

This unit will deal with meaning and importance of research in various areas of Home Science. Exposure to different types of research designs and measurement in Home Science research would also be given.

- Meaning, purpose and significance of research
- Research as a scientific method
- Types of research
- Quantitative, Qualitative and mixed method approaches
- Research Designs –Experimental and Non-Experimental; Descriptive and Observational; Participatory research
- Internal and external validity of research design
- Variables, concepts and measurement in research
- Levels of measurement
- Units of analysis

UNIT II: Sampling and Research tools & techniques **15 Hours**

This unit will introduce the student to the concept of sampling and methods used to draw sample from population using examples from Home Science discipline. Students would also learn about types of data, its collection and reliability and validity concerns.

- Role of sampling in research
- Sampling techniques and their applicability, Sample size and sampling error
- Types of data: Primary and Secondary
- Tools of data collection; types, construction and administration- Interview, Questionnaire, Observation, Focus group discussion and other methods
- Validity and reliability of data collection tools

UNIT III: The Research Process **15 Hours**

This unit will elaborate upon the various steps involved in conducting and reporting researches in Home Science.

- Defining the problem, research questions, objectives, hypotheses
- Review of related literature and originality in writing
- Systematic research: concept and methodology
- Planning the research
- Identifying variables and constructing hypothesis
- Selecting appropriate research methodology and tools

- Data analysis: coding and tabulation
- Writing a research report: styles and formats
- Citation formats: in medical sciences, social sciences

UNIT IV: Values, Social Responsibility and Ethics in Research **5 Hours**

This unit will apprise the students about ethical concerns while conducting and reporting research.

- Ethical principles guiding research: from inception to completion and publication of research
- Plagiarism and Academic integrity in research: plagiarism tools and software
- Ethical issues relating to research participants and the researcher
    - Rights, dignity, privacy and safety of participants
    - Informed consent, confidentiality, anonymity of respondents, voluntary participation, harm avoidance

PRACTICAL
(Credits 1; Hours 30)

1. Data visualization
2. Levels of Measurement
3. Types of research designs
   Experimental and non-experimental; Descriptive and observational
   Qualitative, Quantitative and mixed method
4. Sampling techniques and sample size calculation
   Probability sampling method
   Non-Probability sampling methods
5. Tools of data collection- Interview schedule, questionnaire and FGD
    - Designing/ Construction
    - Preparation of tools for ethical review
    - Pilot testing/ validity and reliability of the tool\
6. Data collection and analysis process: conducting interviews, administering questionnaire
7. Coding and tabulation of data for analysis
8. Citation formats and Plagiarism
9. Reviewing a research paper from a specific area of specialization in Home Science

ESSENTIAL READINGS

- Kerlinger F. N. and Lee, H.B. (2017). *Foundations of Behavioral Research* 4th Ed. Harcourt College Publishers.
- Kothari, C. R. (2019). *Research Methodology: Methods and Techniques*. New Age International Pvt Ltd, New Delhi.
- Kothari, C. R. (2022). *Shodh Padhati* 1st Ed. New Age International Pvt Ltd, New Delhi.
- Kumar, R. (2019) Research Methodology: A Step-by-Step Guide for Beginners. 5th Ed. Sage Publications, New Delhi.

SUGGESTED READINGS

- Bernard, H. R. (2000). *Social research methods: Qualitative and quantitative approaches.* Thousand Oaks, CA.: Sage.
- Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches.* Thousand Oaks, CA: Sage Publications.
- Davis, A. M., Treadwell, D. (2019). Introducing Communication Research: Paths of Inquiry. United Kingdom: SAGE Publications.
- Flynn, J.Z., Foster, I.M. (2009). *Research Methods for the Fashion industry.* Fairchild books, Bloomsbury publishing.
- Indian National Science Academy (INSA) (2019). *Ethics in Science Education, Research and Governance*. ISBN:978-81-939482-1-7. http://www.insaindia.res.in/pdf/EthicsBook.pdf
- Jacobsen, K. H. (2020). *Introduction to health research methods: A practical guide*. Jones & Bartlett Publishers.
- UGC (2021) *Academic Integrity and Research Quality*. New Delhi: UGC, Retrieved from https://www.ugc.ac.in/e-book/Academic%20and%20Research%20Book_WEB.pdf

B.A (Prog.) with Nutrition and Health Education (NHE)

Category-V

DISCIPLINE SPECIFIC ELECTIVE COURSE – DSE-NHE-8 : NUTRITIONAL ASSESSMENT FOR HEALTH

CREDIT DISTRIBUTION, ELIGIBILTY AND PREREQUISITES OF THE COURSE

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Nutritional Assessment for Health	4	3	-	1	Class XII	NIL

LEARNING OBJECTIVES:

1. To familiarize students with importance of nutritional assessment for health
2. To equip students with knowledge of tools and techniques of anthropometric assessments
3. To make students aware of biochemical, clinical and dietary assessment

LEARNING OUTCOMES:

After completion of the course, the students will be able to:

1. Understand various nutritional assessment methods

2. Determine nutritional status by anthropometric measurements
3. Analyze and interpret clinical examination and dietary survey data

SYLLABUS OF DSE-NHE-8

THEORY
(Credits 3: 45 Hours)

UNIT 1: Introduction to nutritional status assessment methods **(6 Hours)**

- This unit will introduce the importance and methods of nutritional status assessment.
- *Subtopics:*
  - Importance and objectives of nutritional status assessment
  - Overview of nutritional status assessment methods

- Indirect methods
  - i) Vital statistics
  - ii) Ecological factors assessment
- Direct methods (ABCD analysis)
  - i) Anthropometry
  - ii) Biochemical and laboratory estimation
  - iii) Clinical examination
  - iv) Dietary survey

UNIT 2: Nutritional anthropometry **(14 Hours)**

- *Unit description:* This unit will familiarize the students with tools and techniques used for common anthropometric measurements and interpretation of anthropometric data for nutritional assessment.
- *Subtopics:*
  - Application of nutritional anthropometry
  - Tools and techniques for common anthropometric measurements
    - Weight
    - Height
    - Mid upper arm circumference (MUAC)
    - Head and chest circumference in children
    - Skinfold thickness
  - Determination of nutritional status by using anthropometric parameters

- Assessment of children: standard deviation (SD score) or Z-score classification, Gomez classification, Indian Academy of Pediatrics (IAP) classification, interpretation of MUAC, growth chart and its importance
- Assessment of adults: Body Mass Index (BMI), waist circumference (WC) for obesity

o Limitations of anthropometry

UNIT 3: Biochemical and clinical assessment **(12 Hours)**

This unit will introduce students to uses and limitations of biochemical and clinical assessments.

- *Subtopics:*

o Biochemical assessment

- Uses and limitations
- Biochemical tests for nutritional deficiencies-an overview

o Clinical assessment

- Advantages and limitations
- Nutritional deficiency disorders and their diagnostic signs

UNIT 4: Dietary assessment **(13 Hours)**

- This unit will introduce students to importance, methods, analysis, interpretation and problems of dietary surveys.
- *Subtopics:*

o Importance and types of dietary surveys

o Methods of diet surveys

o Analysis and interpretation

o Problems in diet surveys

PRACTICAL
(Credit 1: 30 Hours)

UNIT 1: Anthropometry **(15 hours)**

o Anthropometry- weight, height and MUAC measurements.

o Calculation of BMI; interpretation of BMI and WC in adults using case studies

o Plotting and interpretation of growth charts for children below 5 years.

UNIT 2: Clinical and dietary assessment **(15 hours)**

o Identification of clinical signs of common nutritional disorders.

o Dietary assessment- Food Frequency Questionnaire (FFQ) and 24-hour diet recall.

ESSENTIAL/RECOMMENDED READINGS:

- Bamji MS, Rao NP, Reddy V. (2017). *Textbook of human nutrition.* (4th ed). Delhi: Oxford and IBH Publishing co. (P) Ltd.
- Park K. (2023). *Textbook of preventive and social medicine*. (27th ed). Jabalpur, MP: Banarsidas Bhanot Publishers.
- Sharma S &Wadhwa A. (2003). *Nutrition in the community- a textbook.* Delhi: Elite Publishing House (P) Ltd.
- IGNOU (2017). MFN006, Public Nutrition, Delhi.

SUGGESTED READINGS:

- Agarwal A &Udipi SA. (2014). *Textbook of human nutrition.* Delhi: Jaypee Brothers (P) Ltd.
- Gibney et al. (2004). *Public health nutrition*. Hoboken, NJ: Blackwell Publishing

B.A(Prog) with Nutrition and Health Education (NHE)

Category-V

DISCIPLINE SPECIFIC ELECTIVE–DSE- NHE-10 : Nutrition Programme Planning

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course &Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Nutrition Programme Planning	4	3	-	1	Class XII	NIL

Learning objectives:

1.To develop nutrition and health programmes for vulnerable groups and planning nutritious recipes for micronutrient deficiencies.

2.Field visit to ongoing nutrition and health programmes.

3.To plan and implement Nutrition education programmes.

Learning Outcomes:

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

1. Serve as programme planners and managers in the field of Public health nutrition.

2. Develop nutrition education programmes for vulnerable groups and plan nutritious recipie for micronutrient deficiencies.

SYLLABUS OF DSE-NHE-10

THEORY
(Credits 3: 45 Hours)

UNIT 1: Programme planning in public health nutrition. **(15 Hours)**

- This unit will introduce the student to Nutrition Programme Planning.
- Subtopics-
  - Basic principles and models of Programme planning.
  - Planning process – Community need assessment, setting goals and objectives,selecting indicators,selecting interventions,,planning for programme implementation and resources , planning for programme monitoring and evaluation.
  - Planning for programme termination, stakeholder participation in programme.
  - Planning at micro and macro level.

UNIT 2: Programme monitoring and evaluation. **(15 Hours)**

- This unit will introduce the student with programme monitoring and evaluation.
- Subtopics-
  - Significance and purpose of monitoring Food/Nutrition programmes.
  - Identification and selection of indicators for monitoring.
  - Significance and purpose of evaluation of Nutrition programmes.
  - Identification and selection of indicators for evaluation.
  - Strategies for data collection- Qualitative and quantitative.

UNIT 3: Nutritional Surveillance. **(5 Hours)**

- This unit will introduce the student with Nutritional Surveillance.
- Subtopics-
  - Objectives,initial assessment indicators for use in nutrition surveillance.
  - Nutritional surveillance for programme planning: Triple-A- Approach.

UNIT 4: Process of Nutrition education. **(10 Hours)**

- This unit will deal with the process of nutrition education.
- Subtopics-
  - Need , scope and importance of nutrition education.
  - Potential challenges and constraints of nutrition education.
  - Theories of nutrition education.
  - Process of nutrition education communication.

PRACTICAL

(Credit 1 :30 hours)

1. Development of a plan for conducting nutrition education programmes in the community.
2. Preperation of Nutrition education communication aids for different groups.
3. Development of low cost recipes for infants,preschoolers,pregnant and lactating mothers.
4. Field visit to ongoing Nationl Nutritional and health programmes.

Essential/recommended readings :

- Https://www.egyankosh.ac.inPDF last accessed 15 dec 2024.
- Vir,S.C(Ed).2023 . Child ,Adolescent and woman Nutrition in India.Public policies,programmes and progress. K.W Publishers .
- Wadhwa,Aand Sharma,S. 2013 .A textbook of nutrition in the community. Jain book agency.
- Indira Gandhi national open university,2006 MFN 006 Public nutrition. Ed Sharma.S ,Kapur.D .

Suggested readings:

- Vir,S.C(Ed) 2011. Public Health Nutrition in Developing Countries Part 1 and part 2 Woodheed Publishing India.
- Gibney M.J., Margetts, B.M..,Kearney,J,M.,Arab, L. Eds (2004) Public Health Nutrition,NS. Blackwell Publishing.

B.A(Prog) with Nutrition and Health Education (NHE)

Category-V

DISCIPLINE SPECIFIC ELECTIVE–DSE- 12 NHE: Nutrition Policies, Programmes and Strategies

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course &Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Nutrition Policies,Programmes and Strategies	4	3	1	-	Class XII	NIL

Learning objectives:

1. To familiarize the students with the government policies and programmes based on various approaches for improving nutritional and health status of the community .
2. The students will acquire knowledge about the various approaches for improving nutritional and health status.
3. Acquire knowledge about the concept of food security and the various programmes for improving food and nutrition security.

Learning outcomes:

After completion of the course students will be able to-

1. Develop understanding about nutrition in disease management and its prevention through various government programmes and policies.
2. Improve understanding and develop skills for planning , management and monitoring of Public health and nutrition programmes implemented by the government .
3. Work as program planners and managers in the field of Public health and Nutrition.

SYLLABUS OF DSE-NHE-12

THEORY

(Credits 3: 45 Hours)

UNIT 1: National policies for promotion of Nutrition and health status of the population.(10 Hours)

- This unit will introduce the student to various Nutrition and other programmes.
- Subtopics-
  - National Nutrition Mission (Poshan Abhiyan).
  - Ayushman Bharat and Pradhan Mantri Jan Arogya Yojana (PM-JAY)
  - National Diarrhoeal Diseases control programme
  - National health mission.
  - National food security act.
  - Universal immunisation programme.(Mission indradhanush)

UNIT 2: Nutrition sensitive and nutrition specific programmes. **(10 Hours)**

- This unit will deal with various Nutrition programmes.
- Subtopics-
  - ICDS/Poshan 2.0 and Saksham Anganwadi.

- Nutrient deficiency control programmes-National Prophylaxis programme for prevention of blindness due to Vitamin A deficiency, Anaemia Mukt Bharat.(AMB),National iodine deficiency disorders control programme.
- National programme for Prevention and control of Non communicable diseases.
- Pradhan mantri Poshan shakti Nirman-(P.M POSHAN)
- Scheme for Adolescent girls.

UNIT 3: Food security programmes. **(10Hours)**

- This unit will introduce the student with various Food security programmes.
- Subtopics-
  - Concept and definition of food and nutrition security at National,household and individual levels.
  - Public distribution system (PDS) .
  - Antyodaya Anna Yojana (AAY)
  - Annapurna scheme.
  - Mahatama Gandhi National Rural Employment Gurantee Act (MGNREGA)

UNIT 4: Strategies for improving Nutrition. **(15Hours)**

- This unit will deal with the strategies for improving Nutrition.
- Subtopics-
  - Health based interventions including immunization, provision of safe drinking water/sanitation,prevention and management of diarrhoeal diseases and National Policies to address sanitation.
  - Food based interventions including Food fortification,dietary diversification, supplementary feeding and Biochemical approaches.
  - Education based interventions including growth monitoring and promotion (GMP),health/nutrition related behaviour change communication.

Essential/recommended readings :

- https://poshanabhiyan.gov.in Last accessed 17 Dec 2024.
- Indira Gandhi national open university,2006 MFN 006 Public nutrition. Ed Sharma.S ,Kapur.D .
- Radhakrishna R,Reddy, .K.V..Food security and nutrition:Vision 2020.planningcommission.nic.in/reports/genrep/bkpap2020/16_bg2020
- https///www.nitiforstates.gov.in/policy-viewer?id=PNC540Q000045
- https://egyankosh.ac.inPDF

Suggested readings:

- A.Agarwal,S.A.Udipi(2014)*Text book of Human Nutrition*.Delhi.Jaypee brothers medical publisher (P) Ltd.

- Vir,S.C(Ed) 2011 Public Health Nutrition in Developing Counries Part 1 and part 2 Woodheed Publishing India.

[Appendix-43
Resolution No. 14-1 (14-1-6)]