

UNIVERSITY OF DELHI

CNC-II/093/1(28)/2023-24/21

Dated: 29.12.2023

**NOTIFICATION**

Sub: Amendment to Ordinance V

[E.C Resolution No. 14-1/-(14-1-6/-) dated 09.06.2023 and 27-1-1/ dated  
25.08.2023]

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

**Add the following:**

Syllabi of Semester-IV, V and VI of the following courses of Department of Home Science under the Faculty of Science based on Under Graduate Curriculum Framework -2022 implemented from the Academic Year 2022-23 :

- (i) BSc. (Hons.) Home Science
- (ii) BSc. (Hons.) Food Technology
- (iii) BSc. (Prog.) Home Science
- (iv) BA (Prog.) Food Technology
- (v) BA (Prog.) Nutrition & Health Education (NHE)
- (vi) BA (Prog.) Human Development & Family Empowerment (HDFE)
- (vii) BA (Prog.) Apparel Design & Construction (ADC)

**DEPARTMENT OF HOME SCIENCE**

**SEMESTER 4**

**B.Sc. Hons (Food Technology)**

**DISCIPLINE SPECIFIC CORE COURSE**

**DSC FT10: Food Quality Management**

**CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course title & code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Theory	Tutorial	Practical/Practice		
<b>FOOD QUALITY MANAGEMENT</b>	<b>4</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>XII Pass with PCM/PCB</b>	<b>NIL</b>

**Learning Objectives**

- To appreciate the significance of food quality assurance in food processing.
- To comprehend approaches to Food Quality Management.
- To understand Food Quality Management during food production.

**Learning Outcomes**

After completing this course, students will be able to:

- Apply knowledge of food quality management in food value chain.
- Understand the dynamics and Techno- managerial approaches in the agri- food chain.
- Apply food recall and traceability protocols to assure food quality.
- Identify different contaminants formed during food production.

## **SYLLABUS OF DSC FT10**

### **THEORY** **Credits: 3; Hours: 45**

#### **UNIT I: Introduction to Food Quality**

**15 Hours**

Unit Description: This unit will provide concept of food quality management and assurance in the agri- food chain.

*Subtopics:*

- Definition of food quality: concepts, perception, attributes.
- Quality control and quality assurance.
- Food quality management functions.
- Food quality relationship and its management in the agri- food production chain.

#### **UNIT II: Approaches to Food Quality Management.**

**15 Hours**

Unit Description: This unit will provide insights on different approaches of quality management, food recall and traceability in the agri -food production chain.

*Subtopics:*

- Dynamics in the agri- food chain.
- Techno- managerial approach in Food Quality Management.
- Core developments in food quality management
- Food Recall
- Food Traceability

#### **UNIT III: Food Quality Management during food production.**

**(15 Hours.)**

Unit Description: This unit will provide information on contaminants formed during processing and packaging of foods. Major focus will be on emerging concerns with food contaminants.

*Subtopics:*

- Contaminants formed during processing & packaging – nitrosamines, acrylamide, aldehydes, benzene, dioxins, 3- mono chloro 1,2-propanediol (3-MCPD), furans, and methyl furans, VOCs.
- Persistent organic pollutants, PAH (Polycyclic Aromatic Hydrocarbons), Heterocyclic amines (HCAs), fumigants, autoxidation products.
- Emerging concerns in food- Microplastics, Bisphenol A, Endocrine Disruptors, hypersensitivities from food additives.

**PRACTICAL**  
**Credit : 1, Hours: 30**

1. Determination of quality standards and inspection of various food grains- cereals and -nutri - cereals/millets.
2. Determination of quality standards and inspection of pulses.
3. Determination of quality standards and inspection of spices and condiments.
4. Perform qualitative tests for fats and oils.
5. Determination of non-permitted colours in fruits and vegetables.
6. Estimation of ammonia nitrogen in water.
7. Prepare an effective HACCP plan for any food commodity or process in the food chain.

**Essential Readings**

- Pieterel A, Luning. & Willem, J. Marcelis. (2009). *Food Quality Management Technological and Managerial principles and practices*. Wageningen.
- Lawley, R., Curtis, L., & Davis, J. (2012). *The food safety hazard guidebook*. Royal Society of Chemistry.
- DeMan. (2007). *Principles of Food Chemistry*. Springer, 3<sup>rd</sup> edition.

**Suggested Readings**

- Carol, E., Steinhart, M. and Ellin, D. (1995). *Food Safety*, Food Research Institute. New York: Marcel Dekker, Inc
- Shapton, D.A. and Shapton, N.F. (1998). *Principles and Practices for the safe processing of Foods*. CRC Press.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC CORE COURSE****DSC FT11: Poultry & Egg Processing Technology****CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course title & code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Theory	Tutorial	Practical/Practice		
Poultry & Egg Processing Technology	4	3	0	1	XII Pass with PCM/PCB	NIL

**Learning Objectives**

- To understand primary processing of poultry, chicken quality and by-product utilization.
- To understand HACCP models for poultry processing.
- To understand egg production practices, and egg preservation methods.
- To understand egg quality and development of value-added products.

**Learning Outcomes**

After completing this course, students will be able to:

- Understand the need and importance of egg and poultry industry.
- Comprehend egg production and poultry product processing.
- Acquire knowledge about application of HACCP model for poultry processing.
- Understand value-addition and by-product utilization

**SYLLABUS OF DSC FT011****THEORY****Credits: 3; Hours: 45****Unit 1 Introduction****5 Hours**

Unit Description: The unit will provide an understanding of the status and development of the Poultry industry, chicken quality, and processing of poultry and by-products.

*Subtopics:*

- Development of Poultry industry in India and its need in nation's economy,
- Chicken Quality - Color, Flavor, Texture, Water-Holding Capacity (WHC), Emulsification capacity.

**Poultry products processing****15 Hours**

- Primary processing of poultry,
- Inspection, Grading, Cut Up and Composition, ante-mortem and post-mortem inspection of poultry,
- A Generic HACCP model for poultry slaughter.
- Processing of enrobed poultry products, HACCP for a Cooked Product Model.
- Poultry by-products.

**UNIT II: Egg Industry and Egg Production Practices****12 Hours**

Unit Description: The unit will provide knowledge on the status and development of the Egg industry, and management of poultry farms.

*Subtopics:*

- The egg industry , Production of shell eggs
- Laying stock, Brooding period
- General management of Poultry farm.

**UNIT III: Quality identification of shell eggs****5 Hours**

Unit Description: The unit will provide an understanding of the factors that affect egg quality. Measures of egg quality will also be covered.

*Subtopics:*

- Grading of shell eggs
- Factors affecting egg quality
- Measures of Albumen and Yolk quality

**UNIT IV: Preservation of eggs****8 Hours**

Unit Description: The unit will provide information on the functional properties of eggs and different egg product processing and preservation techniques.

*Subtopics:*

- Refrigeration and freezing, egg powder manufacture, egg coatings.
- Functional properties of eggs and development of value-added products

**PRACTICAL**  
**Credit : 1, Hours: 30**

1. To study the shelf-life of eggs by different methods of preservation
2. Evaluation of eggs for quality parameters (market eggs, branded eggs)
3. To perform freezing of yolk/albumen
4. Egg product formulation.
5. Cut out analysis of canned chicken/retort pouches (external parameters).
6. Cut out analysis of canned chicken/retort pouches (internal parameters).
7. Planning generic HACCP model for poultry.
8. To prepare flow chart of enrobed chicken products/evaluate the quality of enrobed chicken products (chicken nuggets).

**Essential Readings**

- Shai, Barbut. (2016). *Poultry Products Processing. An Industry Guide*. CRC Press.
- Stadelman, W. J., Newkirk, D., & Newby, L. (2002). *Egg science and technology*. 4th ed. New Delhi: CBS Publication.
- Isabel Guerrero-Legarreta, Hui, Y.H .et.al.(2010)Handbook of Poultry Science and Technology, Volume 2:Secondary Processing. Wiley Publication

### **Suggested Readings**

- Owens, C. M. (2010). *Poultry meat processing*. CRC Press.
- Richardson, R.I.,Mead,G.C(2005)Poultry meat Science New Delhi:CABI Publishing
- Parkhurst, C., &Mountney, G. J. (1997). *Poultry meat and egg production*. New Delhi: CBS Publishers

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## DISCIPLINE SPECIFIC CORE COURSE

### DSC FT12: Food Engineering- I

#### CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE

Course title & code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Theory	Tutorial	Practical/Practice		
Food Engineering- I	4	3	0	1	XII Pass with PCM/PCB	Nil

#### Learning Objectives

- To understand the concept of unit operation, units and dimensions.
- To comprehend the different Heat and mass transfer, refrigeration and Freezing operations.
- To understand the fundamentals of food engineering systems and its process.

#### Learning Outcomes

After completing this course, students will be able to:

- Understand the principle of unit operation.
- Apprehend the different methods of separation in the food industry.
- Acquire the basic knowledge of thermal properties, methods of heat transfer and mass transfer, principles of refrigeration and freezing.
- Apply these principles for solving numerical problems.

#### SYLLABUS OF DSC FT12

##### THEORY

Credits: 3; Hours: 45

##### UNIT I: Introduction

6 Hours

Unit Description: The unit will provide information on the concept of unit operation, mass balance and energy balance system.



*Subtopics:*

- Concept of Unit operation
- Units and dimensions, Unit conversions, dimensional analysis
- Mass and Energy Balance

**UNIT II: Separation Processes**

**12 Hours**

Unit Description: The unit will provide an insight into the principle and equipment design of various separation processes like distillation, extraction, centrifugation, filtration and sedimentation.

*Subtopics:*

- Distillation principles and methods: steam, batch, continuous distillation with rectification and stripping.
- Extraction : Hildebrandt, Bollman, SCF extraction
- Filtration : Plate and frame, pressure leaf, continuous rotary vacuum, batch and continuous filtration
- Centrifugation: Tubular, disc bowl and basket centrifuge
- Sedimentation : continuous thickener

**UNIT III: Heat and Mass Transfer**

**15 Hours**

Unit Description: The unit will provide knowledge of thermal properties of food, design and derivation of heat and mass transfer systems and applications.

*Subtopics:*

- Systems for heating and cooling food products
- Thermal Properties of Food
- Modes of heat transfer- Conduction, Convection and Radiation
- Applications of steady state heat transfer, estimation of conductive heat transfer coefficient, convective heat transfer coefficient, overall heat transfer coefficient and design of tubular heat exchanger
- Fick's Law of Diffusion
- Related basic numerical
- Membrane separation systems-Electrodialysis system , Reverse Osmosis, Ultra filtration, Microfiltration
- Membrane devices used for RO and UF: Plate and Frame, Tubular, Spiral wound and hollow fiber devices

**UNIT IV: Refrigeration and Freezing**

**12 Hours**

Unit Description: The unit will provide concept of refrigerants, VCR cycle, components of Refrigeration system and freezing time calculations

*Subtopics:*

- Concept, properties and selection of refrigerants
- Description of Vapor compression refrigeration (VCR) cycle
- Pressure Enthalpy charts and Tables
- Mathematical expressions useful in analysis of VCR cycle
- Numerical on VCR system using R -134a, R-717, R-12; Saturated cycle and deviations from the standard
- Freezing time calculation using Plank equation
- Frozen food storage

**PRACTICAL**  
**Credit : 1, Hours: 30**

1. Mass and Energy Balance Calculations
2. Determination of alcohol insoluble solids using extraction process
3. Determination of the osmotic pressure of the given sample
4. Estimation of sedimentation rate
5. Determination of thermal properties of the given samples
6. Mathematical Design of Heat exchanger
7. Cooling refrigeration load calculations.
8. Determination of Convective heat transfer coefficient and freezing time
9. Determination of freezing point depression in given solution

**Essential Readings**

- Rao, D.G. (2010). *Fundamentals of food engineering*. PHI learning private ltd.
- Singh, R.P. and Heldman, D.R. (2009) *Introduction to food engineering* 2nd edition. 4th edition Academic press.
- Singh, R.P. and Heldman, D.R. (2014) *Introduction to food engineering* 5th edition. Academic press

**Suggested Readings**

- Earle, R.L. (1983). *Unit Operations in Food Processing*, 2nd edition. Pergamon press.
- Fellows, P. (2009). *Food processing technology*. Woodhead publication, 3rd edition
- Garg, M., Chaturvedi, S., Sadhu, S.D. and Barwa, M. and Pani. B ., (2020) *Practical Handbook of Food Engineering* Aryush Education, ISBN NO. 978-81-930437-5-2

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**DISCIPLINE SPECIFIC ELECTIVE COURSE****DSE FT02 A: Bakery Technology****CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course title & code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Theory	Tutorial	Practical/Practice		
Bakery Technology	4	2	0	2	XII Pass with PCM/PCB	Nil

**Learning Objectives**

- To understand the fundamentals of baking and technology of various bakery products.
- To understand basic knowledge, importance, quality and safety concerns in bakery industry.
- To understand technology used in modified bakery products for different health conditions.

**Learning Outcomes**

After completing this course, students will be able to:

- Understand the fundamentals of baking.
- Acquire the knowledge of technologies of bakery products.
- Understand trends in bakery industry.
- Get an overview of modified bakery products for different health conditions

**SYLLABUS OF DSE FT03****THEORY**

**Credits: 2; Hours: 30**

**UNIT I: Introduction**

**5 Hours**

- Bakery industry, current status and economic importance of bakery Industry in India.

- Nutritional quality and safety, pertinent standards & regulations, safety concerns

## **UNIT II: Bakery products**

**18 Hours**

- Bread, Buns and Pizza base: Ingredients & processes for breads, buns, pizza base, changes taking place during baking, product quality characteristics, faults and corrective measures
- Cakes: Ingredients & processes for cakes, product quality characteristics, faults and corrective measures. Different types of icings.
- Pastry: Ingredients & processes for pastry, product quality characteristics, faults and corrective measures.
- Biscuits and Cookies: Ingredients & processes, product quality characteristics, faults and corrective measures.

## **UNIT III: Modified bakery products**

**7 Hours**

- Modification of bakery products for people with special nutritional requirements e.g. high fibre, sugar free, low sugar, low fat, gluten free bakery products, use of fat and sugar replacers, enzymes, egg replacers and natural preservatives in bakery products.

### **PRACTICAL**

**Credit: 2, Hours: 60**

1. Introduction of tools and equipment used in preparation of bakery products.
2. Quality assessment of wheat flour used in the preparation of baked products.
3. Preparation and acceptability of yeast leavened baked products (bread/ bun/ pizza base).
4. Preparation and acceptability of biscuits.
5. Preparation and acceptability of cookies.
6. Preparation of different types of cakes and their acceptability.
7. Preparation of different types of icings.
8. Development of any bakery product with special nutritional requirement.

### **Essential readings:**

- Zhou, W., Hui, Y. H., Leyn, I. De., Pagani, M. A. , Rosell, C. M. , Selman, J. D., & Therdthai, N. . (2014). *Bakery Products Science and Technology* (Second ed.): John Wiley & Sons, Ltd.
- Dubey, S.C. (2007). *Basic Baking* 5th Ed. Chanakya Mudrak Pvt. Ltd.

### **Suggested readings:**

- Khetarpaul, N. (2005). *Bakery Science and Cereal Technology*. India: Daya Publishing House.
- Edwards, W. P. (2015). *The Science of Bakery Products*. United Kingdom: Royal Society of Chemistry.
- Samuel, A. Matz (1999). *Bakery Technology and Engineering*. PAN-TECH International Incorporated
- Barndt, R. L. (1993). *Fat & Calorie – Modified Bakery Products*. US: Springer

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**DISCIPLINE SPECIFIC ELECTIVE COURSE****DSE FT 02 B: Agribusiness Management****CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course title & code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Theory	Tutorial	Practical/Practice		
Agribusiness Management	4	2	0	2	XII Pass with PCM/PCB	NIL

**Learning Objectives**

- To develop an insight of agribusiness management
- To develop an insight for different types of marketing management
- To gain knowledge and acquired skills for setting up an agribusiness and its management.

**Learning Outcomes**

After completing this course, students will be able to:

- Understand the basic knowledge of Agri-business management
- Develop insight for Agricultural Supply Chain Management
- Examine the role of various type of marketing management in agri-business
- Understand the different support system for agri-business
- Skill Development- After studying this paper, students will be able to identify entrepreneurial potential in agribusiness and explore the scope of sustainable agricultural produce, marketing and supply chain management. This paper would also improve the skill set of the students, enhance their agribusiness managerial skills and leadership quality which will entitle them to work in industries.

**SYLLABUS OF DSE FT05****THEORY**  
**Credits 2 (30 Hours)****Unit 1 Concepts and application of agribusiness****15 Hours**

Unit Description: The unit will provide an understanding of the Concepts and application of agribusiness.

*Subtopics:*

- Nature and Characteristics of Agribusiness

- Agro-based Industries in India
- Agricultural Supply Chain Management
- Strategic Management in Agribusiness
- Contract Farming
- ICT In Agribusiness

## **UNIT II: Marketing Management**

**15 Hours**

Unit Description: The unit will provide knowledge on the concept of marketing management

*Subtopics:*

- Concepts of Marketing
- Marketing management: role of management in agri-business, attributes and responsibility of manager
- New product development and Product life cycle
- Product-mix, 4Ps of marketing

**Practical**  
**Credit : 2, Hours: 60**

1. Study of various business models in agri-business
2. Case study of Agri business and its aspects
3. Study of farm records & inventory
4. Study of system of book keeping & accountancy
5. Study of farm planning techniques & situations
6. Study of farm budgeting techniques & types
7. Study of balance sheet financial ratio analysis
8. Study of preparation of cash flow plan
9. Visit of Agri business enterprise

### **Essential Readings:**

- Baker, G.A., Grunewald, O. Gorman, W.D. (2002) Introduction to food and agribusiness management: Prentice Hall of India, New Delhi.
- Kotler (1994). Marketing Management: Prentice Hall of India, New Delhi.
- S.S.Johl, T.R.Kapoor (2017) Fundamentals of farm business management: Kalyani Publishers, Ludhiana
- David, D. & Erickson, S. (1987) Principles of Agri Business Management. New Delhi: McGraw Hill Book Co.

### **Suggested Readings:**

- Jakobsen, G. & Torp, J.E. (2001). Understanding Business systems in developing countries.
- Ahmad, S.M. (2000). Management Info Guide.
- Prasanna, C. (1996). Projects, Planning, Analysis, Selection, Implementation and Review. New Delhi: Tata McGraw-Hill Publishing Company Limited.
- K. Loknandhan, K. Mani, K. Mahendran (2015). Innovations in Agribusiness Management
- Tripathi (2012). Principles of Management: Tata McGraw-Hill Education

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## DEPARTMENT OF HOME SCIENCE

### SEMESTER 5

#### B.Sc. Hons (Food Technology)

#### DISCIPLINE SPECIFIC CORE COURSE

#### DSC FT13: Food Microbiology

#### CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE

Course title & code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Theory	Tutorial	Practical/Practice		
Food Microbiology	4	3	0	1	XII Pass with PCM/PCB	Nil

#### Learning Objectives

- To know the important genera of microorganisms associated with food and their characteristics.
- To understand the role of microbes in fermentation, spoilage and food borne diseases.

#### Learning Outcomes

Upon completion of this course, students are expected to:

- Recognize and describe the characteristics of important pathogens and spoilage microorganisms in foods.
- Understand the role and significance of intrinsic and extrinsic factors on growth and response of microorganisms in foods.
- Identify ways to control microorganisms in foods.
- Identify the conditions under which the important pathogens and spoilage microorganisms are commonly inactivated, killed or made harmless in foods.
- Describe the beneficial role of microorganisms in fermented foods and in food processing.
- 6. Utilize laboratory techniques to detect, quantify, and identify microorganisms in foods.

- Acquire, discover, and apply the theories and principles of food microbiology in practical, real-world situations and problems.
- Develop success skills in communication, critical thinking, interaction, information acquisition and interpretation and life-long-learning.

## **SYLLABUS OF DSC FT13**

### **THEORY** **Credits: 3; Hours: 45**

#### **UNIT I: Microorganisms in food**

**15 Hours**

Unit Description: The unit shall introduce students to the world of food microbiology. The structure and growth of bacteria, yeast, mold and virus in food as well as how the intrinsic and extrinsic factors affect the growth of microorganisms shall be taken up. The growth curve of bacteria will be covered to understand various phases of growth.

##### *Subtopics:*

- Introduction, history and scope of food microbiology.
- Morphological and physiological features of bacteria, yeast, mold. Introduction to bacterial endospores and capsules. Food borne viruses and their reproduction.
- Growth curve of bacteria.
- Factors affecting growth of microbes in foods.
- Role of microorganism in fermentation, spoilage and food borne diseases.

#### **UNIT II: Cultivation of microorganism**

**10 Hours**

Unit Description: Isolation and cultivation is the heart of microbiology. Therefore, the various techniques related to their cultivation and enumeration shall be taught. Although some are already taken in practicals but not all of them. A theoretical insight is needed.

##### *Subtopics:*

- Principles of cultivation of microorganism (purity, activity etc.).
- Pure culture technique.
- Methods of isolation and enumeration (including latest ones).
- Rapid methods of bacteria detection.

#### **UNIT III: Microbial food spoilage**

**10 Hours**

Unit Description: Food is the best substrate for the microorganism to grow, multiply and cause undesirable changes. The spoilage of raw as well as processed foods is very common. Therefore, as a food processor the understanding of food spoilage is very important for the students, in order to preserve the food.

##### *Subtopics:*

- Sources of microorganism in foods.
- Spoilage in milk, meat, cereals, fruits and vegetables (and few associated products).
- Spoilage in canned foods.

#### **UNIT IV: Food preservation by novel technologies**

**10 Hours**



Unit Description: There are many convention and new methods of food preservation. The novel methods cause minimum changes in sensory and nutritive properties of food. It is imperative to teach such methods and their application in food preservation.

*Subtopics:*

- Conventional methods of food preservation- an overview.
- Non-thermal methods such as pulse electric field preservation, high hydrostatic pressure, ohmic heating, irradiation, biopreservation etc. to be familiarized.
- Hurdle concept and minimal processing.

**PRACTICAL**  
**Credit: 1; Hours: 30**

1. Introduction to the Basic Microbiology Laboratory Practices and Equipment's
2. Functioning and use of compound microscope
3. Cleaning and sterilization of glassware
4. Preparation and sterilization of nutrient broth
5. Preparation of slant, stab and plates using nutrient agar
6. Cultivation and sub-culturing of microbes
7. Morphological study of bacteria and fungi using permanent slides
8. Simple staining
9. Gram's staining
10. Standard Plate Count Method

**Essential Readings**

- Frazier William C and Westhoff, Dennis C. Food Microbiology, TMH, New Delhi, 2004
- Jay, James M. Modern Food Microbiology, CBS Publication, New Delhi, 2000
- Garbutt, John. Essentials of Food Microbiology, Arnold, London, 1997
- Pelczar MJ, Chan E.C.S and Krieg, Noel R. Microbiology, 5th Ed., TMH, New Delhi, 1993
- W. M. Foster (2020) Food Microbiology. CBS Publishers & Distributors Pvt Ltd.

**Suggested Readings**

- Bibek Ray and Arun Bhunia. Fundamentals food microbiology, 5<sup>th</sup> Ed, CRC Press, 2014.
- K.R. Aneja. Experiments in microbiology, plant pathology, tissue culture and microbial biotechnology, New age international publishers, 2018.
- Roger Y. Stanier. General Microbiology, Macmillan, 1987.
- K.R. Aneja. Modern Food Microbiology, Medtech, 2018

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## DISCIPLINE SPECIFIC CORE COURSE

### DSC FT14: Food Engineering II

#### CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE

Course title & code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Theory	Tutorial	Practical/Practice		
Food Engineering II	4	3	0	1	XII Pass with PCM/PCB	Appeared in Food Engineering- I

#### Learning Objectives

- To understand the principle of size reduction and mixing unit operations
- To acquaint with fundamentals of fluid flow process and psychrometrics
- To understand the basics of designing of evaporator and dehydrator

#### Learning Outcomes

After completing this course, students will be able to:

- Apprehend the principles of size reduction and mixing unit operations.
- Comprehend the applications of fluid flow, steam and psychrometrics
- Understand basic design of evaporator and dehydrator used in food processing
- Apply these principles for solving numerical problems

#### SYLLABUS OF DSC FT14

##### THEORY

**Credits: 3; Hours: 45**

#### UNIT I: Introduction to Size Reduction and Mixing Operations

**10 hours**

Unit Description: The unit will provide information on the application of size reduction and mixing unit operations in food processing industry.

*Subtopics:*

- Introduction of size reduction and mixing operation
- Types of size reduction
- Size reduction equipment (crusher, grinding mill, pulveriser, roller mill, knife cutter)
- Application of size reduction

- Size separation, screening, screening equipment and applications
- Mixing equipment for solids and pastes (Planetary mixer, Kneader, Ribbon mixer, Double cone mixer)
- Applications of mixing in solids and fluids

## **UNIT II: Fluid Flow in food Processing**

**11 hours**

Unit Description: The unit will provide knowledge of fluid characteristics, viscometers and pressure measuring devices

*Subtopics:*

- Liquid Transport systems
- Newton's Law of Viscosity
- Principle and operation of Capillary tube and rotational viscometer
- Properties of Non-Newtonian fluids
- Flow characteristics, Reynolds Number, Bernoulli's Equation
- Concept of Flow Measurement devices

## **UNIT III: Steam and Evaporation**

**12 hours**

Unit Description: The unit will provide an understanding of generation of steam process, functioning and designing of evaporators

*Subtopics:*

- Generation of steam
- Construction and functions of fire tube and water tube boilers
- Thermodynamics of Phase change
- Steam tables
- Boiling point elevation
- Types of evaporators
- Design of single effect evaporators

## **UNIT IV: Psychrometrics and Dehydration**

**12 hours**

Unit Description: The unit will provide knowledge of the psychrometrics, dehydration process and designing of dehydrator

*Subtopics:*

- Properties of dry air, water vapour, air vapour mixture
- Psychrometric Chart and its application
- Basic Drying Process
- Moisture content on wet basis and dry basis
- Dehydration systems
- Dehydration system Design

## **PRACTICAL**

**Credit: 1; Hours: 30**

1. Screen analysis of food sample
2. Study the effect of temperature on viscosity of Newtonian / non-Newtonian fluids
3. Operation of pressure measuring instrument
4. Study properties of moist air using Psychrometer and psychrometric chart
5. Determination of evaporation rate of given food sample
6. Determine elevation in boiling point of given solution
7. Study steam table and its application

8. Operation of tray dryer and drying process calculations
9. Determination of drying characteristics of given food sample

### **Essential Readings**

- Fellows, P. (2009). *Food processing technology*. Woodhead publication, 3rd edition
- Rao, D.G. (2010). *Fundamentals of food engineering*. PHI learning private ltd.
- Singh, R.P. and Heldman, D.R. (1993) *Introduction to food engineering* 2<sup>nd</sup> edition. Academic press
- Singh, R.P. and Heldman, D.R. (2014) *Introduction to food engineering* 5th edition. Academic press

### **Suggested Readings**

- Earle, R.L. (1983). *Unit Operations in Food Processing*, 2nd edition. Pergamon press.
- Garg, M., Chaturvedi, S., Sadhu, S.D. and Barwa, M. and Pani. B ., (2020) *Practical Handbook of Food Engineering* Aryush Education, ISBN NO. 978-81-930437-5-2
- Jafari, Seid Mahdi, ed. (2021) *Engineering Principles of Unit Operations in Food Processing: Unit Operations and Processing Equipment in the Food Industry*. Woodhead Publishing.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC CORE COURSE****DSC FT 15: Food Chemistry I****CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course title & code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Theory	Tutorial	Practical/Practice		
Food Chemistry I	4	3	0	1	XII Pass with PCM/PCB	Nil

**Learning Objectives**

- To understand the composition of food.
- To learn the structure, interaction, importance & stability of macro & micro components.
- To understand the functional aspects of food components and to study their role in food processing.

**Learning Outcomes**

After completing this course, students will be able to:

- Understand and describe the general chemical structures of the major & minor components of foods.
- Give a molecular rationalization for the observed physical properties and reactivity of the food components.
- Provide a theoretical explanation for observed extent and rates of reactions that are common to foods
- Predict how processing conditions are likely to change the reactivity of food components

**THEORY**

**Credits: 3; Hours: 45**

**Unit I: Introduction to Food Chemistry**

**2 Hours**

**Unit II: Water**

**8 Hours**

- Definition of water in food
- Structure of water and ice
- Types of water

- Sorption phenomenon
- Water activity and packaging
- Water activity and shelf-life

### **Unit III: Macronutrients**

**26 Hours**

#### **Lipids**

- Classification of lipids
- Physical properties-melting point, softening point, specific gravity, refractive index, smoke, flash and fire point, turbidity point.
- Chemical properties-reichert meissl value, polenske value, iodine value, peroxide value, saponification value.
- Effect of frying on fats
- Changes in fats and oils- rancidity, lipolysis, flavor reversion
- Auto-oxidation and its prevention
- Technology of edible fats and oils- Refining, Hydrogenation and Interesterification, Fat Mimetics

#### **Proteins**

- Protein classification and structure
- Properties of proteins (electrophoresis, sedimentation, amphoterism and denaturation,)
- Functional properties of proteins eg. organoleptic, solubility, viscosity , binding gelation / texturization , emulsification , foaming.

#### **Carbohydrates**

- Classification (mono, oligo and poly saccharides)
- Structure of important polysaccharides ( starch, glycogen, cellulose, pectin, hemicellulose, gums)
- Chemical reactions of carbohydrates –oxidation, reduction , with acid & alkali
- Modified celluloses and starches

### **Unit IV : Micronutrients**

**11 Hours**

#### **Vitamins**

- Structure ,Importance and Stability
- Water soluble vitamins
- Fat soluble vitamins

#### **Minerals**

- Major and minor minerals
- Metal uptake in canned foods
- Toxic metals

### **PRACTICALS**

**Credit: 1; Hours: 30**

1. Preparation of primary and secondary standard Solutions.
2. Estimation of moisture content.
3. Determination of gelatinization temperature range (GTR) of different starches and effect of additives on GTR.
4. Determination of refractive index and specific gravity of fats and oils.
5. Determination of smoke point and percent fat absorption for different fat and oils.
6. Determination of percent free fatty acids.
7. Estimation of saponification value.
8. Estimation of total ash content.

**Essential Readings**

- DeMan, J.M.(2018).Principles of Food Chemistry.NewYork: AVI.
- Fennema, Owen R. (2017).Food Chemistry. 3rd Ed..NewYork: Marcell Dekker
- Whitehurst and Law.(2002).Enzymes in Food Technology. Canada: CRC Press.

**Suggested Readings**

- Potter, N.N. and Hotchkiss, J.H. (1999). Food Science, 5th Ed., Chapman & Hall.
- Wong, Dominic WS. (2018). Food Enzymes. New York: Chapman and Hall.
- Meyer, L.H. (2004). Food Chemistry. CBS Publishers & Distributors Pvt Ltd, India.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC ELECTIVE COURSE****DSE FT03 A: Food Fermentation Technology****CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course title & code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Theory	Tutorial	Practical/ Practice		
Food Fermentation Technology	4	2	0	2	XII Pass with PCM/PCB	Nil

**Learning Objectives**

- To understand the concept and significance of fermentation
- To understand the principles of food fermentation technology
- To study the types of starters used in the food industry
- To study the production of various fermented foods

**Learning Outcomes**

- An understanding of the basic components of Food Fermentation Technology and their principles.
- An understanding of the concept of the different fermentation processes.
- Develop insight into common types of starters used in the Food Industry.
- Apply acquired skills in the production of various fermented foods.

**SYLLABUS OF DSE FT 03****THEORY****Credits: 2; Hours: 30****UNIT I: Introduction to fermentation****10 Hours**

Unit description: This unit introduces the concept of fermentation as a process, its basic requirements and types. It also covers the types of microbes required in the process resulting



in the formation of different products along with the emphasis on the significance of fermentation

*Subtopics:*

- Definition of Fermentation
- Types of fermentation process: submerged/solid state, Batch/continuous fermentation
- Requirements for the fermentation process
- Role of Starter cultures and their types commonly used in fermentation
- Importance of Fermentation

**UNIT II: Fermentation Technology**

**10 Hours**

Unit description: This unit covers Food Fermentation Technology with a focus on fermenters and their operations. Both the concept of upstream and downstream processing will be taught along with coproduct recovery

*Subtopics:*

- Fermenter: design and its operation
- Measurement and control of fermentation
- Upstream processing- screening and identification of microorganisms, media preparation, multiplication of microbes
- Downstream processing -Recovery of fermentation products and conversion into commercially viable products, Co-product recovery, and valorization

**UNIT III: Fermented Products**

**10 Hours**

Unit description: This unit describes the fermentation process of various products and their classification with an emphasis on the Indian traditional fermented products.

*Subtopics:*

- Types of fermented products and their classification
- Fermentation of milk, vegetables, cereals
- Industrial Production of selected products -Baker's yeast, Cider, Vinegar, and Cheese
- Traditional Indian Fermented products

**PRACTICAL**

**Credit: 2, Hours: 60**

1. To study the design and operation of a lab scale fermenter
2. To study the sugar utilization patterns by microorganisms
3. To determine  $\beta$ -galactosidase activity of microorganisms
4. To perform Solid State Fermentation using byproducts as a substrate at lab scale.
5. To produce Baker's Yeast
6. To prepare Sauerkraut
7. To prepare Curd /Yogurt
8. To develop a fermented food/drink utilizing plant products or their by- products
9. To develop a fermented food/drink utilizing animal products or their by-products

**Essential Readings**

- Brian, J. Wood. (1997). *Microbiology of Fermented Foods*. Volume II and I. Elsevier Applied Science Publication.

- Joshi, V.K. & Pandey. A. (2009). *Biotechnology: Food Fermentation Microbiology, Biochemistry and Technology*. Volume I and II. Asiatech Publishers Inc.
- Stanbury, P.F., Whitekar A. and Hall (2013). *Principles of Fermentation Technology*. Reed Elsevier India Pvt.Ltd.

#### **Suggested Readings**

- Adams, M. & Moss, M. (2008). *Food Microbiology*. 2nd Edition. RSC Publishing.
- John, Garbutt. (1997). *Essentials of Food Microbiology*. Arnold International Students Edition.
- Arnold L. Demain & Julian E. Davis. *Industrial Microbiology & Biotechnology*, ASM Press. (2004).

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC CORE COURSE****DSE FT 03 B: Traditional Indian Foods****CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course title & code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Theory	Tutorial	Practical/Practice		
TRADITIONAL INDIAN FOODS	4	2	0	2	XII Pass with PCM/PCB	NIL

**Learning Objectives**

- To understand the evolution, cultural, regional diversity and health benefits of traditional Indian foods.
- To understand the processing and preservation methods used for traditional Indian foods.

**Learning Outcomes**

After completing this course, students will be able to:

- Upon successful completion of this course students will gain knowledge of the diverse traditional Indian foods from the vedic times, states, regions, cultures and religion.
- The course aims to provide hands-on training to students in processing of different traditional Indian foods for setting enterprise, promotion of healthy forgotten traditional foods for research and development.

**SYLLABUS OF DSE FT 06****THEORY****Credits 2 (30 Hours)****Unit 1 Introduction to Traditional Indian foods****15 Hours**

Unit Description: This unit will be covering the history and tradition of Indian foods from various cultures, regions and religions.

*Subtopics:*

- History of Indian Food Culture and Traditional Foods
- The journey of food from various Indian civilizations to Vedic period and modern era
- Categories of traditional foods of India: Traditional foods from different regions/states and different cultures and weaning foods in Indian tradition

- Concepts of Ayurvedic foods, classification of food based on Ayurveda: Grain based, fruits and vegetable based, milk-based traditional foods in Ayurvedic system.

## **UNIT II: Processing and preservation of traditional Indian foods**

**15 Hours**

Unit Description: The unit will provide knowledge on the processing and preservation of traditional Indian foods

*Subtopics:*

- Ancient practices of food preservation: Dehydration, osmotic drying techniques
- Other Processing techniques used in preparation of traditional Indian foods

### **Practical Credit : 2, Hours: 60**

**Unit I:** Practicals based on literature survey of the traditional Indian foods including the ingredients used, processing and health benefits.

1. Students will make presentations on vedic foods of India
2. Presentation on regional/state wise traditional Indian foods

**Unit II:** Practicals based on processing and preservation techniques used in Traditional Indian foods

1. Preparation of regional traditional foods: Regional cuisine preparation
2. Functional traditional foods: Fermented foods (grain based/drinks), adjuncts (papad/chutney/pickle).
3. Ayurvedic food preparations: Fruits and vegetable based/milk and milk product-based (ghee/buttermilk) processing of traditional foods
4. Processing of a traditional Indian foods by osmotic dehydration/drying

### **Essential Readings**

- Achaya, K.T. (1994). Indian Food: A Historical Companion. Oxford University Press.
- Sarkar, P., Dh, L. K., Dhumal, C., Panigrahi, S. S., & Choudhary, R. (2015). Traditional and ayurvedic foods of Indian origin. Journal of Ethnic Foods, 2(3), 97-109.
- Raghunathsuri. (2012). Bhojanakutuhalam (Translated from original by Scholar of I-AIM, Institute of Ayurveda and Integrative Medicine, Bangalore).
- Suri, R. Balakrishna, A. (2013). Bhojanakutuhalam, first ed. Divya Prakashan, Haridwar, pp.1-373.

### **Suggested Readings**

- Singh, A., & Singh, R. K. (2007). Cultural significance and diversities of ethnic foods of Northeast India.
- Subbulakshmi, G and Subhadra, M. (2020). Nutrition in Traditional Therapeutic Nutrition. Daya Publishing House Vol. 1 and 2

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## DEPARTMENT OF HOME SCIENCE

### SEMESTER 6

#### B.Sc. Hons (Food Technology)

#### DISCIPLINE SPECIFIC CORE COURSE

#### DSC FT16: Food Packaging

#### CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE

Course title & code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Theory	Tutorial	Practical/Practice		
Food Packaging	4	3	0	1	XII Pass with PCM/PCB	Nil

#### Learning Objectives

- To impart comprehensive overview of the scientific and technical aspects of food packaging.
- To instil knowledge on packaging machinery, systems, testing and regulations of food packaging
- To acquire knowledge of package designing for different food groups

#### Learning Outcomes

After completing this course, students will be able to:

- Comprehend the overview of scientific and technical aspects of food packaging
- Understand packaging machinery, systems and testing of material and package
- Acquire an insight into food packaging laws and regulations
- Apprehend the requirement of packaging material and package designing of food.

#### SYLLABUS OF DSC FT16

##### THEORY

Credits: 3; Hours:45

#### UNIT I: Introduction to Food Packaging

15 Hours

Unit Description: The unit will provide information on the status and concept of packaging, different packaging materials, their manufacturing process and applications

*Subtopics:*

- Status of Packaging industry, concept of food packaging
- Flexible packaging material (paper, plastic films, laminate and Aluminum foil)-manufacturing process and applications
- Semi rigid packaging material (paper board, corrugated board and composite carton)-manufacturing process and applications
- Rigid packaging material (metal, glass and plastic containers)-manufacturing process and applications
- Aseptic, active and intelligent packaging systems

## **UNIT II: Package Designing for Foods**

**15 Hours**

Unit Description: The unit will provide knowledge of factors affecting shelf life of food, packaging system requirement and package designing

*Subtopics:*

- Fresh horticultural produce
- Animal foods
- Dry and moisture sensitive foods
- Frozen foods
- Fats and oils
- Thermally processed food

## **UNIT III: Testing of Food Packaging Material and Package**

**8 Hours**

Unit Description: The unit will provide an understanding of the testing and quality evaluation of packaging material and package.

*Subtopics:*

- Testing procedures for packaging materials- thickness, tensile properties, puncture resistance, bursting strength, seal strength, water vapor permeability, gas transmission rate (CO<sub>2</sub> and O<sub>2</sub> permeability), grease resistance
- Compatibility and shelf-life studies
- Evaluation of transport worthiness of filled packages

## **UNIT IV: Regulatory Aspects of Food Packaging**

**7 Hours**

Unit Description: The unit will provide knowledge of the food packaging and labelling regulations, environment issues and life cycle analysis (LCA)

*Subtopics:*

- Food Packaging and Labelling regulations (FSSAI)
- Sustainable and green packaging-environment issues
- LCA definition and methodology, carbon foot print and its significance in packaging material

## **PRACTICAL** **Credit: 1, Hours: 30**

1. Identification of plastic using floatation method.

2. Demonstration of the operation of Shrink wrapping/Vacuum packaging/Form Fill and Seal packaging machinery
3. Testing of packaging material and package: COBB / tensile strength /bursting strength / tear resistance/ drop/ leakage
4. Testing of thermal shock resistance of glass.
5. Study of water vapor transmission rate of packaging material.
6. Development of biodegradable film.
7. Design a package label
8. Study porosity of tinplate.
9. Examination of can double seam

#### **Essential Readings**

- Saha, N. C. (2022). *Food Packaging: Materials, Techniques and Environmental Issues*. Springer Nature.
- Robertson, G.L. (2012) *Food Packaging – Principles and Practice*. CRC Press Taylor and Francis Group
- Coles, R., McDowell, D.& Kirwan, MJ. (2003). *Food Packaging Technology*. Blackwell publication
- Paine, F.A. and Paine, H.Y. (1992). *A Handbook of Food Packaging*. Blackie Academic and Professional.

#### **Suggested Readings**

- Daniel, Lu. and Wong, D. (Eds). (2017). *Materials for Advanced Packaging*. Springer
- Garg, M., Meena, P.L., Sadhu, S.D. and Alam, T. (2020) *Food Packaging: A Practical Guide*, The Computype Media (Publishing Division), ISBN No.614027934-9

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC CORE COURSE****DSC FT 17: Food Chemistry II****CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course title & code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Theory	Tutorial	Practical/Practice		
Food Chemistry II	4	3	0	1	XII Pass with PCM/PCB	Nil

**Learning Objectives**

- To understand the chemistry of food components and their interactions.
- To know about the role of enzymes and its application in food industry.
- To co-relate the quality changes during different processing methods of food.
- To understand the concept of new food product development.

**Learning Outcomes**

After completing this course, students will be able to:

- Determine approaches that may be used to control the reactivity of those food components that are likely to impact the overall quality of finished products.
- Interpret the reasoning of changes occurring in food during different processing treatments.
- Learn basic methods of food product development.

**THEORY**

**Credits: 3; Hours:45**

**Unit I: Sensory Aspects (Colour & Flavour)****Natural Food Pigments**

**6 Hours**

- Introduction and classification
- Food pigments (Sources, Structure, Stability and Interactions)



- Chlorophyll
- Carotenoids
- Anthocyanins and flavonoids
- Beet pigments
- Myoglobin

#### **Flavour**

**5 Hours**

- Definition and basic tastes
- Chemical structure and taste
- Description of food flavours , Flavour enhancers

#### **Unit II : Enzymes**

**10 Hours**

- Introduction, classification
- General characteristics
- Enzymes in food processing
- Industrial Uses of Enzymes
- Immobilized enzymes

#### **Unit III: Changes occurring during food processing treatments.**

##### **Physico-chemical and nutritional changes occurring during food processing treatments**

**9 Hours**

- Drying and dehydration
- Irradiation
- Freezing
- Canning

#### **Browning Reactions In Food**

**7 Hours**

- Enzymatic browning
- Non – Enzymatic browning:
- Maillard reaction
- Caramelization
- Ascorbic acid oxidation

#### **Unit IV: New Food product development**

**8 Hours**

- Definition
- Importance
- Need of product development
- Stages of product development
- Product development tools
- Reasons for failure
- Product Life Cycle

### **PRACTICAL**

**Credit: 1; Hours: 30**

1. Determination of thermal inactivation time of spoilage enzymes (Blanching time) in fruits and vegetables.
2. Estimation of minerals -demo
3. Estimation of iodine value
4. Estimation of peroxide value
5. Estimation of reducing and non-reducing sugars using potassium ferricyanide method.

6. Determination of carotenoids w.r.t flour pigments.
7. Extend of non-enzymatic browning by extraction methods.
8. Introduction of the concept of new product

### Essential Readings

- DeMan, J.M.(2018).Principles of Food Chemistry.NewYork: AVI.
- Fellows, P. J. (2009). *Food processing technology: principles and practice*. Elsevier.
- Rahman, M. S. (2020). Handbook of Food Preservation. 3<sup>rd</sup> Edition. India: CRC Press.
- Fennema, Owen. R. (2017). Food Chemistry, 3rd Ed., New York: Marcell Dekker.
- Whitehurst and Law (2002).Enzymes in Food Technology. Canada: CRC Press.
- Graf, E & Saguy,I.S (2011). Food Product Development. Newyork, AVI pub.Co.

### Suggested Readings

- Wong, Dominic W.S. (1996). Food Enzymes. New York: Chapman and Hall.
- Desrosier, Norman W. and Desrosier, James.N. (2018). The technology of food preservation, 4th Ed.Westport, Conn.: AVI Pub. Co.
- Hui, Y. H., & Evranuz, E. Ö. (Eds.). (2015). Handbook of vegetable preservation and processing. CRC press.
- Eskin, N. M., & Shahidi, F. (2012). Biochemistry of foods.
- Simpson, B. K., Nollet, L. M., Toldrá, F., Benjakul, S., Paliyath, G., & Hui, Y. H. (Eds.). (2012). Food biochemistry and food processing. John Wiley & Sons.

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**DISCIPLINE SPECIFIC CORE COURSE****DSC FT18: Food Safety****CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course title & code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Theory	Tutorial	Practical/ Practice		
<b>FOOD SAFETY</b>	<b>4</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>XII Pass with PCM/PCB</b>	<b>Nil</b>

**Learning Objectives**

- To understand the concept of safe food and types of hazards associated with food.
- To control the potential threats to the safety of food.
- To familiarize with Good Hygienic Practices, Food Safety Management Systems and the Indian regulatory regime

**Learning Outcomes**

After completing this course, students will be able to:

- Understand the concept of food safety, types of hazards, and their control measures
- Identify and prevent potential sources of food contamination
- Comprehend the need for hygiene and sanitation for ensuring food safety
- Knowledge of Food Safety Management tools and introduction to the Indian regulatory regime
- Practical knowledge to detect and quantify microorganisms from various routes of contamination of food

## **SYLLABUS OF DSC FT18**

### **THEORY** **Credit: 3; Hours: 45**

#### **UNIT I Introduction to Food Safety**

**6 Hours**

Unit Description: This unit introduces the concept of safe food. It focuses on the significance of food safety, common types of hazards associated with food, and factors that affect the safety of food, especially in a developing country like India.

Subtopics:

- Definition of safe food
- Types of hazards
- Factors affecting Food Safety
- Importance of Safe Foods

#### **UNIT II Hazards associated with food**

**14 Hours**

Unit Description: This unit begins with how various hazards gain entry into the food chain, then gradually delves into each hazard type, its example, and its impact. The unit also covers the chemical and biological hazards in depth keeping in view their public health significance. Topics like mycotoxins, indicator organisms, and allergens are also included for a better understanding of their relationship to food safety.

Subtopics:

- Mode of entry of hazards into food
- Physical hazards –common examples and control measures
- Chemical hazards (naturally occurring, environmental including radioactive components and intentionally added ), packaging material as a threat
- Biological hazards ( Foodborne pathogens: bacteria, viruses, and eukaryotes) , Seafood and Shellfish poisoning, Mycotoxins, Indicator Organisms
- Food Allergens

#### **UNIT III Management of Hazards**

**16 Hours**

Unit Description: This unit covers all the key factors which influence food safety in depth and provides hands-on information on managing hazards in the food industry. This unit helps the students not only to understand the significance of hygiene and sanitation but also the critical role of water and food handlers in maintaining food safety. The recent food safety management tools have also been included to emphasize the applied aspects of food safety.

Subtopics:

- Factors influencing food safety -Design of food plant, Temperature Danger Zone and Storage of Food, Food handler and personal hygiene, Quality of Water
- General Principles of Hygiene, Sanitation and methods of control using physical and

chemical agents, Waste Disposal, Pest and Rodent Control

- Food Safety Management Tools -Basic Concept, HACCP, ISO series, TQM - components of TQM, Risk Analysis

#### **UNIT IV Trends in Food Safety**

**9 Hours**

Unit Description: Food safety is a dynamic area of food science where new challenges recurrently appear and finding solutions to them is the key to safe food. This unit covers the current status of Food Safety Regulations in the country and all the emerging hazards in food. The new advances in food safety pertaining to the detection of hazards, food-borne pathogens, and preservation methods are also discussed.

Subtopics:

- Food Safety Regulations and their current status in India
- New and emerging pathogens and chemical hazards
- Genetically Modified Foods \ Transgenics, Organic foods
- Newer approaches to hazard and pathogen detection
- Recent technologies in food preservation and pathogen detection

#### **PRACTICAL**

**Credit: 1, Hours: 30**

1. Preparation of different types of media (complex, differential and selective)
2. Enumeration of aerial microflora using PDA
3. Identification of Molds by lactophenol blue staining
4. Bacteriological Analysis of Water by MPN method
5. Assessment of surface sanitation by swab / rinse method
6. Assessment of Personal Hygiene
7. Preparation of a HACCP plan
8. Testing of foods for microbiological hazards

#### **Essential Readings**

- Forsythe, S.J. (2020). The Microbiology of Safe Food, 3rd edition. UK: Willey.
- Lawley, R., Curtis L. and Davis, J. (2015) The Food Safety Hazard Guidebook. London: RSC.
- Marriott, N G. and Gravani RB (2006). Principles of Food Sanitation. 5th edition New York: AVI
- Mathur, P. (2018). Food Safety and Quality Control. Hyderabad: Orient BlackSwan Pvt. Ltd.

#### **Suggested Readings**

- de Blackburn, C and Mc Clure P. (2009). Food borne pathogens. Hazards, risk analysis & control. 2nd edition. Washington, US: CRC Press.
- De Vries. (2014). Food Safety and Toxicity. New York: CRC.
- Mortimore S. and Wallace C. (2013). HACCP-A Practical Approach 3rd edition. London: Springer.

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**DISCIPLINE SPECIFIC ELECTIVE**  
**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/ Practice		
Research Methods in Home Science	4	3	0	1	NIL	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 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; 30 Hours)**

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* 4<sup>th</sup> 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* 1<sup>st</sup> Ed. New Age International Pvt Ltd, New Delhi.
- Kumar, R. (2019) *Research Methodology: A Step-by-Step Guide for Beginners*. 5<sup>th</sup> 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](https://www.ugc.ac.in/e-book/Academic%20and%20Research%20Book_WEB.pdf)

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**



## **DEPARTMENT OF HOME SCIENCE**

### **SEMESTER-IV**

#### **UG Programme for Bachelor in B.Sc. Home Science (Hons.) degree in three years**

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

#### **DISCIPLINE SPECIFIC CORE COURSE**

#### **DSC HH 410 : Textile 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/ Practice		
Textile Science	4	3	0	1	XII Pass	Appeared in Fashion Studies

#### **Learning Objectives**

- To impart knowledge regarding production, properties and usage of textile fibres and yarns
- To create awareness regarding various techniques of fabric production and their properties
- To give an overview of dyeing, printing and finishing of textiles

#### **Learning Outcomes**

- Describe textile fibres in terms of their production and properties
- Understand production techniques and properties of yarns
- Explain various methods of fabric construction and relate them to specific uses keeping in mind fabric properties
- Recall various dyeing, printing and finishing techniques

#### **SYLLABUS OF DSC HH 410**

#### **THEORY**

**(Credits 3; Hours 45)**

**UNIT I: Fundamentals of Textile Fibres**

**6 Hours**

Unit Description: This unit will deal with the key concepts of textile polymers, morphology of textile fibers, primary, secondary properties and classification of textile fibers.

- Morphology of textile fibers: Monomer, Polymer, Degree of Polymerisation, Crystalline and Amorphous Regions, Orientation
- Primary and secondary properties
- Fiber classification

**UNIT II: Production and Properties of Fibers**

**12 Hours**

Unit Description: This unit will introduce the student to selected commercially significant cellulosic, protein and man-made fibers, their production, chemistry, properties and usage.

**UNIT III: Production and Properties of Yarns**

**8 Hours**

Unit Description: This unit will discuss the techniques of yarn production, types of yarns and their properties.

- Yarn construction:
  - Mechanical spinning (Cotton system, Wool system, Worsted system)
  - Chemical spinning (Wet, Dry, Melt)
- Types of yarns: Staple and Filament yarns, Simple and Complex yarns, Textured Yarns
- Yarn Properties: Yarn Twist and Balance, Yarn Count

**UNIT IV: Fabric Construction**

**11 Hours**

Unit Description: This unit will apprise the students about different fabric construction techniques. Students will learn basic principles of weaving, knitting and non-woven fabrics.

- **Weaving**
  - Parts of a loom
  - Operations and motions of the loom
  - Classification of weaves- construction, characteristics, usage
- **Knitting**
  - Classification of knits
  - Construction and properties of warp and weft knits
- **Non-wovens**
  - Types
  - Construction
  - Properties and usage

**UNIT V: Basics of Textile Processing**

**8 Hours**

Unit Description: This unit help students gain insight to the fundamentals of textile processing, viz. dyeing, printing and finishing.

- **Dyeing**
  - Fundamentals of dyeing- Dyes and Pigments
  - Stages of dyeing- Advantages and Disadvantages
- **Printing**
  - Fundamentals of printing
  - Difference between dyeing and printing,

- Methods of printing: Block, Screen
- Styles of printing: Direct, Resist, Discharge
- **Finishes**
  - Classification of finishes
  - Routine finishes

**PRACTICAL**  
**(Credits 1; Hours 30)**

1. Fibre Identification tests –Visual, burning, microscopic and chemical	8
2. Yarn Identification – Single, ply, cord, textured, elastic, monofilament, multifilament and spun yarn	4
3. Thread count and balance	6
4. Fabric identification (woven, knitted, non-woven)	2
5. Identification of basic weaves	4
6. Tie-Dye	6

**Essential Readings:**

- Rastogi, D. & Chopra, S. (Eds.) (2017). *Textile Science*. New Delhi, India: Orient Black Swan Publishing Limited.
- Rastogi, D, Chopra, S., Arora, C. & Chanchal (Eds.). (2016). *Textile Science-A Practical Manual*. New Delhi, India: Elite Publishing House Private Limited.
- Sekhri S. (2022). *Textbook of Fabric Science: Fundamentals to Finishing*. Delhi, India: PHI Learning Pvt Ltd.
- Joseph, M. L. (1988). *Essentials of Textiles*. (6th Edition). Florida: Holt, Rinehart and Winston Inc.
- Corbman, P.B. (1983). *Textiles- Fiber to Fabric*. (6th Edition). USA: McGraw Hill.

**Suggested Readings:**

- Collier B. & Tortora G. Phyllis. (1997). *Understanding Textiles*. USA: Merrill.
- Hollen, N. and Saddler, J. (1979). *Textile*. New York: Mcmillan.
- Sekhri S. (2023) , वस्त्र विज्ञान (Vastra Vigyaan). Delhi: PHI Learning Private Ltd.

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**DISCIPLINE SPECIFIC CORE COURSE**  
**DSC HH 411 : Personal Finance and Consumer Studies**

**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		
Personal Finance and Consumer Studies	4	3	0	1	XII Pass	Appeared in Fundamentals of Resource Management

**Learning Objectives**

- To provide students an understanding of income, saving and investment management in the changing socio-economic environment
- To acquaint students with the concept of consumers' role in an economy, consumer problems, education, consumer aids and empowerment
- To comprehend issues related to consumer protection, legislative measures and redressal mechanisms

**Learning Outcomes**

After completing the course, students will be able to:

- Acquire knowledge of income, saving and investment management in the changing socio-economic environment.
- Develop an understanding about the issues related to consumer protection, legislative measures and redressal mechanisms.
- Gain conceptual knowledge of critically evaluating and designing various consumer aids and about consumer education and protection.
- Learn to undertake food adulteration tests through lab analysis.
- Understand the schemes and services offered by banks and post offices.

**SYLLABUS OF DSC HH 411**

**THEORY**  
**(Credits 3; Hours 45)**

**UNIT I: Income and Expenditure**

**14 Hours**

The unit focuses on developing the fundamental concepts of income, savings and investment management and its applicability in changing socio-economic environment.

- Household Income – Types, Sources, Supplementation of family income

- Income management – significance of budgeting, steps of making a budget, household accounts
- Factors influencing expenditure pattern
- Family savings and investments- need, principles, channels of investment, tax implications
- Consumer credit

## **UNIT II: Consumer in India: Consumer problems and education**

**12 Hours**

This unit attempts to acquaint the students with an understanding of the consumer problems, role of consumer education and empowerment in today's context.

- Definition of a consumer
- Role of consumers in the economy
- Types of consumer problems – products and service related, causes and remedies
- Guidelines for wise buying practices
- Consumer education and empowerment, sustainable consumption
- Changing nature of the business world –e-commerce, e-business

## **UNIT III: Consumer Protection**

**10 Hours**

This unit will orient the students to the need for consumer protection, and rights and responsibilities available for safeguarding consumers' interest.

- Consumer protection
- Consumer rights and responsibilities
- Consumer organizations and their role in consumer protection

## **UNIT IV: Legislative framework for consumers protection**

This unit focuses on the legislative framework, acts and redressal mechanisms available for consumer protection.

- Basic legislative framework for consumer protection in India
- Consumer Protection Act (COPRA) and its amendment
- Alternative redressal mechanisms
- Standardization and quality control measures

## **PRACTICAL (Credits 1; Hours 30)**

1. Understanding and designing standardization marks.
2. Evaluation and designing of informative and attractive labels for different types of products.
3. Evaluation and designing of advertisements for print/digital media including products, services and social ads.
4. Case study of banks and post offices to understand their services and products.
5. Learning to fill different bank forms.
6. Analysis of consumer redressal through case study approach.
7. Food adulteration tests.

### **Essential readings**

- Kotler, P.T., Armstrong, G., Agnihotri, P. (2018). *Principles of Marketing: Basic concepts of marketing*. Pearson Education. ISBN 13: 978-9352865611.

- Maheswaran, D. (2019). *Understanding Indian Consumers*. 1st Edition. Oxford University Press. ISBN 13: 978-0199479627.
- Mital M., Jain, S., & Mehta, C. (2015). *Family finance and Consumer Studies: A Practical Manual, Second Edition*. New Delhi: Elite Publishing House Pvt. Ltd.
- Mital, M., Sawhney, H. K. (2015). *Family Finance and Consumer Studies*. New Delhi: Elite Publishing House Pvt. Ltd.
- Rajni. (2020). *Personal Finance and Planning*. JSR Publishing House LLP.
- Seetharaman, P. and Sethi, M. (2001). *Consumerism: Strength and Tactics*. New Delhi: CBS Publishers.

#### **Suggested readings**

- Arora, R. (2005). *Consumer Grievances Redressal*. New Delhi: Manak Publications.
- Khanna, S. R., Hanspal S., Kapoor S. & Awasthi H.K. (2007). *Consumer Affairs*. Universities Press India Pvt. Ltd.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC CORE COURSE**  
**DSC HH 412: Physical Science for 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/ Practice		
Physical Science for Home Science	4	2	0	2	XII Pass	Appeared in Communication Concepts and Theories

**Learning Objectives**

- To acquire knowledge of different compounds/substances and their importance
- To impart knowledge about various alternate energy sources
- To enhance their skills in handling different equipment

**Learning Outcomes**

After completing the course, students would be able to:

- Acquire the ability to correlate structures of different compounds/substances like biomolecules, polymers, surfactants and metals with their properties and functions
- Understand the basic principles of different analytical techniques and the equipment used
- Develop understanding of the basics of different physical phenomenon and their applications in day-to-day life
- Understand the basic concept of nanotechnology and green chemistry
- Understand the various renewable energies and need of energy conversion

**SYLLABUS OF DSC HH 412**

**THEORY**  
**(Credits 2; Hours 30)**

**Section A-Chemistry**

**UNIT I: Macromolecules, Dyes, surfactants and metals**

**12 Hours**

This unit highlights biomolecules, synthetic polymers, dyes, cleaning agents and metals

- Carbohydrates - Classification, structures and properties.
- Proteins – Amino acids (structures, classification and properties), and basic concepts of proteins structure
- Lipids – Classification, structures and properties of fatty acids, triacylglycerol and structural lipids
- Synthetic polymers – Classification, polymerisation, polymer morphology, general properties of polymers, (Examples - PE, PP, PVC, PET, PS, PTFE, Nylons), biodegradable polymers, compounding, recyclable plastics (Impact on environment and human health)

- Dyes – Classification of dyes, chemistry of dyeing, food colours, natural dyes
- Surfactants – Soaps and synthetic detergents (structure, cleansing action and their applications)
- Metals- Characteristics of metals and their alloys (iron, aluminium, copper, silver, steel), types of corrosion, tarnishing, prevention of corrosion

## **UNIT II: Introduction to Green chemistry**

**3 Hours**

This unit highlights the importance of Green chemistry

- Definition of green chemistry
- Need of green chemistry (Indiscriminate use of chemicals, fertilizers and pesticides)
- 12 principles of green Chemistry
- Important examples of green chemistry

## **Section B-Physics**

### **UNIT III: Renewable Energy and Electronics**

**9 Hours**

This unit highlights the importance of Renewable energy and basics of electronics

- Basics of Semi-Conductors and their applications in simple electronic devices.
- Light sources-Incandescent lamp, fluorescent tube, CFL, LED
- Renewable sources of energy: Wind energy, ocean energy, hydro energy, geothermal energy
- Solar Energy- Importance, photoelectric effect, storage, solar cooker, solar green houses, solar desalination, solar cell, need and characteristics of photo-voltaic (PV) systems

### **UNIT IV: Sound, Optics and Nanotechnology**

**6 Hours**

This unit highlights the introduction of nanotechnology, colour measurement, optics, sound and radio communication

- Spectrum of light, chromaticity and CIE chromaticity diagram, basics of spectrometry
- Basics of LASER and optical fibres
- Lenses-types of lenses, power measurement, defects and their remedies, applications in various instruments, photographic camera
- Introduction to nanotechnology, nano materials, properties and applications in different fields
- Basic knowledge of sound, echo, reverberations, acoustics of buildings
- Geostationary satellites, elementary knowledge of radio communication: AM and FM

### **PRACTICAL**

**(Credits 2; Hours 60)**

#### **1. Section A- Chemistry**

- Safe handling and disposal of chemicals generally used in chemical laboratories
- Experiments using Analytical techniques:
  - Separation of mixture of amino acids using paper chromatography and determination of  $R_f$  values
  - Estimation of proteins by Lowry's/ Biuret method
  - Determination of hardness of water by using complexometric titration
- Qualitative tests for carbohydrates
  - Monosaccharides
  - Disaccharides and polysaccharides
- Preparation of Osazones of monosaccharides and disaccharides
- Saponification of the given oil
- Preparation of biodiesel from vegetable oil preferably waste cooking oil.



- Preparation of nanoparticles of gold using tea leaves / silver nanoparticles using plant extracts

## 2. Section B- Physics

- Study of different types of experimental errors, their reporting and graphing techniques
- Determination of inner diameter, outer diameter and depth of beaker using Vernier Calliper
- Determination of area of cross section of glass rod and wire using Screw Gauge
- The use of Multimeter for measuring (a) Resistances, (b) AC and DC Voltages, (c) DC Current, and (d) checking electrical fuses
- Study of the voltage and current of the solar cells in series and parallel combinations.
- Study of V-I & power curves of solar cells, and find maximum power point & efficiency of solar cell.
- Study of the application of solar cells to provide electrical energy to domestic appliances such as lamp, fan and radio.
- Electroplating of the given metal article with a superior metal and to determine the E.C.E.
- Determination of  $\lambda_{\text{max}}$  using colorimeter.
- Verification of Beer- Lambert law.
- To study/observe the effect of size on colour of nanomaterials.
- Study of different types of lenses and determination of power of a convex lens.

### Essential Readings

- Ahluwalia, V. K., Dhingra, S. and Gulati, A., 2005, College Practical Chemistry, University Press (India) Pvt. Ltd, India.
- Anastas, P.T. and Warner, J.C., 1998, Green Chemistry: Theory and Practice, Oxford University Press, U.S.A.
- Bahl, A. and Bahl, B.S., 2022, Advanced Organic Chemistry, (6<sup>th</sup> ed.), S. Chand and Sons, New Delhi.
- Beiser, A., Mahajan, S. and Choudhary, S.R., 2017, Concepts of Modern Physics, McGraw-Hill, India.
- Boyle, G., 2012, Renewable Energy, Power for a sustainable future (3<sup>rd</sup> ed.), Oxford University Press, U.S.A.
- Dua, A. and Manav, N., 2017, Practical Organic Chemistry, Manakin Press, New Delhi.
- Freedman, R.A., Young, H.D. and Ford, A.L., 2021, University Physics with modern physics (15<sup>th</sup> ed.), Pearson Education, India.
- Kulkarni, S. K., 2014, Nanotechnology: Principles & Practices (3<sup>rd</sup> ed.), Capital Publishing Company, New Delhi.
- Lancaster, M., 2016, Green Chemistry: An Introductory Text (2<sup>nd</sup> ed.), RSC Publishing, U.K.
- Poole, C.P., Frank, Jr. and Owens, J., 2003, Introduction to Nanotechnology (1<sup>st</sup> ed.), Wiley India Pvt. Ltd, India.
- Sharma, R.K., Sidhwani, I.T. and Chaudhari, M.K., 2013, Green Chemistry Experiments: A monograph, I.K. International Publishing House Pvt Ltd, New Delhi.
- Sukhatame, S.P. and Nayak, J. K., 2017, Solar energy, Tata McGraw - Hill Publishing Company Ltd., India.

### Suggested Readings:

- Chattopadhyay, K.K. and Banerjee, A. N., 2009, Introduction to Nanoscience and Technology, PHI Learning Private Limited, New Delhi.
- Flint, B.L. and Worsnop, H.T., 1971, Advanced Practical Physics for students, Asia Publishing House, India.
- Jacob, T., 1979, Textbook of Applied Chemistry, McMillan India Ltd., Noida.

- Khandelwal, D. P., 1985, A Laboratory Manual of Physics for Undergraduate Classes, Vani Publication, New Delhi.
- Morrison, R.T., Boyd, R. N. and Bhattacharjee, S.K., 2021, Organic Chemistry (7<sup>th</sup> ed.), Pearson Education, New Delhi.
- Sharma, S.P., 2003, Basic Radio and Television (2<sup>nd</sup> ed.), Tata McGraw Hill, India.
- Singh, H., 2001, B.Sc. Practical Physics, S. Chand and Co., New Delhi.
- Solomon, T.W., 2017, Organic Chemistry (12<sup>th</sup> ed.), John Wiley & Sons, U.S.A.
- Vogel, 2009, Quantitative Chemical analysis, Pearson Education, New Delhi.
- Walker, J., Resnick, R., and Halliday, D., 2013, Fundamentals of Physics, Wiley, U.S.A.

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HH 4A1 : Laws and Policies for Women and Children in India**

**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		
Laws and Policies for Women and Children in India	4	2	0	2	XII Pass	Appeared in Human development II: Middle Childhood and Adolescence

**Learning Objectives**

- To understand the constitutional provisions for women and children in India
- To study the programmes and policies for women and children in India
- To appreciate the challenges in implementation of laws and policies

**Learning Outcomes**

The students will:

- Comprehend the existing constitutional provisions for women and children in India
- Obtain knowledge of policies and programmes as they relate to lives of children and women
- Be able to engage with the linkages between laws and policy implementation

**SYLLABUS OF HH 4A1**

**THEORY**

(Credits 2; Hours 30)

**UNIT I: Overview of provisions**

**10 Hours**

- Social and constitutional status of women and children
- Overview of laws and policies for women and children
- Rights based approaches to laws and policies
- Challenges in implementation of laws and policies

**UNIT II: Constitutional provisions, laws and conventions for women**

**10 Hours**

- Legislation for women (laws to protect reproductive rights and laws against violence and discrimination)
- Policies and programmes for women (empowerment, health and protection)
- Conventions for women (CEDAW)
- Specific challenges in implementation

**UNIT III: Constitutional provisions, laws and conventions for children**

**10 Hours**

- Legislation for children (PC-PNDT Act; JJ Act; POSCO Act; PwD Act and others)
- Policies and programmes for children (National Policy for Children; ICDS)
- United Nations Convention on the Rights of the Child (UNCRC)
- Specific challenges in implementation

### **PRACTICAL** **(Credits 2; Hours 60)**

1. Essential readings Collect various newspaper articles on relevant topics and make a E-journal/ E- scrapbook.
2. Construct a questionnaire and conduct a survey to explore awareness of laws and policies for women and children
3. Conduct interviews to explore existing conditions, challenges and situations in different communities.
4. Field visits/field placement to relevant government (CWC's, Observation homes) and non-government organizations
5. Audio-visual resources, films and documentaries to understand the need for laws and policies for women and children
6. Workshops/lectures by resource persons from the field of law, programme implementation, field level workers and critical analysis of laws related to children and women
7. Poster/pamphlet preparation for creating awareness on policies and programmes

#### **Suggested Readings:**

- A Comprehensive Guide to Women's Legal Rights For Indian Institute of Technology, KanpurLegalTrainingWorkshop.(2018). [https://www.iitk.ac.in/wc/data/Majlis\\_Legal-rights-of-women.pdf](https://www.iitk.ac.in/wc/data/Majlis_Legal-rights-of-women.pdf)
- Bhargava, V. (2005). Adoption in India: Policies and Experiences. New Delhi: Sage Publications.
- Begum, S. M. (Ed.). (2000). Human Rights in India: issues and perspectives. APH Publishing.
- Chopra, G. (2016). Child rights in India: challenges and social action. S.l.: Springer, India, private.

#### **Essential Readings:**

- Bajpai, A (2003). Child Rights in India: Law, Policy and Practice. New Delhi:
- Bhakhry, S. (2006). Children in India and their Rights. New Delhi: National Human Rights Commission.
- Contemporary publications and documents of the Government of India, UN bodies, established International and National Organisations.
- HumanDevelopmentReport2021-22 <https://hdr.undp.org/content/human-development-report-2021-22>
- Gangoli, G. (2016). Indian feminisms: Law, patriarchies and violence in India. Routledge.
- Halder, D. (2018). Child sexual abuse and protection laws in India. SAGE Publishing India.
- Kumari, V. (2004). Creative Child Advocacy: Global Perspectives. New Delhi: Sage.
- Selected Legislations for Children and Women. Ministry of Women and Child Development GOI website [www.wcd.nic.in/](http://www.wcd.nic.in/)
- Rights to the youngest: Towards a legal framework for early childhood development (2016). Books for Change: Bangalore. ISBN – 978-81-926907-2-8
- Saikia, N. (2008). Indian Women: A Sociolegal Perspective. New Delhi

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time**

**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HH 4B1 : Food Science and Processing**

**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		
Food Science and Processing	4	2	0	2	XII Pass	Appeared in Food Science and Nutrition

**Learning Objectives**

- To enable students to understand the basic chemistry, science of food and techniques involved in food processing.
- To impart knowledge of sensory evaluation of food.
- To understand the role of microorganisms in food processing, preservation and spoilage.

**Learning Outcomes**

- Food science and its interplay in processing of food.
- Understanding of role of microorganisms in preservation and spoilage of food.
- Application of technology in food processing.
- Basics concepts of sensory evaluation in foods and its applications in different food metrics.

**SYLLABUS OF HH 4B1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Understanding to Food Science and Food Chemistry** **12 Hours**

The unit will provide an understanding of the basic terms used in food science, its interdisciplinary approach and applications. It will also provide knowledge about food sources, chemistry and functional properties of important components of the food. Concept of how colloidal systems are formed and their applications in the food industry will also be discussed.

- **Food Science:** Definition, importance and scope of food science.
- **Food Chemistry-** Sources, chemistry and functional properties of Carbohydrates, Lipids and Proteins.
- **Colloidal Chemistry-** Definition, classification, properties and applications of sols, gels, foams and emulsions.

**UNIT II: Food microbiology** **6 Hours**

The unit will introduce microorganisms involved in food spoilage and preservation.

- **Introduction to microorganisms in food** - Characteristics of predominant micro-organisms in food (yeast, mold and bacteria), bacterial growth curve, intrinsic and extrinsic factors for growth of microorganisms.

- **Role of microorganisms in spoilage and preservation of food-** Important food spoilage micro-organisms (psychotrophic, thermophilic, osmophilic microbes), spoilage in specific food groups (raw meat, fruits & vegetables, milk and milk products), role of microorganisms in food fermentation.

### **UNIT III: Food processing Techniques**

**8 Hours**

The unit provides an understanding of different food processing techniques, and their applications in food preservation.

- **Food processing techniques-**Non-thermal techniques - refrigeration, freezing, additives, filtration, osmosis, irradiation.  
Thermal processing techniques – Blanching, dehydration, canning, pasteurization, concentration.

### **UNIT IV: Sensory Science**

**4 Hours**

The unit will help in understanding of the physiological basis of the sensory evaluation of food and subjective and objective methods of sensory evaluation.

- Physiological basis of sensory evaluation
- Subjective and objective methods of sensory evaluation

### **PRACTICAL (Credits 2; Hours 60)**

1. Food analysis: Moisture, pH and acidity using standard methods. Total soluble solids (by refractometer).
2. Analysis of hygiene of college canteen and understanding the applications of GHP, HACCP, ISO 22000.
3. Identification of bacteria, yeast and mold from prepared slides.
4. Preparation of foam, gel and emulsion to understand their properties.
5. Preservation of food using non-thermal techniques (Freezing, use of additives).
6. Preservation of food using thermal techniques (Dehydration/Drying/Concentration).
7. Sensory evaluation of given food samples using different sensory evaluation methods.

### **Essential Readings:**

- Frazier WC and Westhoff DC (2014). Food Microbiology, Fifth Edition. TMH Publication, New Delhi.
- Manay NS and Shadaksharaswamy M (2008). Food-Facts and Principles, Third Edition. New Age International (P) Ltd. Publishers, New Delhi.
- Mathur P. (2018). Food Safety and Quality Control. Orient BlackSwan Pvt. Ltd., Hyderabad.
- Suri S and Malhotra A (2014). Food Science, Nutrition and Safety. Delhi: Pearson India Ltd., New Delhi.
- Potter NN and Hotchkiss H J (1996). Food Science, Fifth Edition. CBS Publication, New Delhi.
- Srilakshmi B (2014). Food Science, 6th Edition. New Age International Ltd., Delhi.

### **Suggested Readings:**

- Mohini Sethi, Eram Rao (2011). Food science- Experiments and applications, Second Edition. CBS publishers & Distributors Pvt Ltd., New Delhi
- Raina U, Kashyap S, Narula V, Thomas S, Suvira, Vir S, Chopra S (2010). Basic Food Preparation: A Complete Manual, Fourth Edition. Orient Black Swan Ltd., New Delhi.
- Sivashankar. B (2002). Food Processing and Preservation. PHI learning Pvt. Ltd., New Delhi

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HH 4C1: Communication for Development**

**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		
Communication for Development	4	2	0	2	XII Pass	Appeared in Communication Concepts and Theories

**Learning Objectives**

- To understand the concept of development and development indicators.
- To gain insights into the concept of Development Communication, philosophy, theories and approaches.
- To inculcate the knowledge of development communication and relations with media and society.
- To comprehend about problems and issues of the development.
- To examine the role of various media in development communication.

**Learning Outcomes**

- Be conversant with the dimensions of development and the development frameworks.
- Comprehend the key concerns of development and the role of communication.
- Understand issues in development as a basis for effective development communication.
- Comprehend the role of information, communication and media in the field of development and social change.

**SYLLABUS OF HH 4C1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Development and Development Indicators**

**8 Hours**

The unit elucidates on the concept of development and its various dimensions. It provides an overview of development goals and highlights the level of development across countries.

- Concept of development
- Growth vs development
- Development goals
- Classification of countries based on development indices
- Indices as a measure of human development (HDI, GDI, GII, GGI & MPI)
- Characteristics of developing countries

## **UNIT II: Development Communication (DC)**

**11 Hours**

This unit focuses on how communication is used to promote development. It highlights different perspectives and approaches of Dev. Comm. It explores how communication strategies are formulated for development and how communication contributes to inclusive growth.

- Development Communication (DC) - concept, genesis, characteristics, and philosophy
- Approaches to DC
- Models of DC - Dominant Paradigm, Dependency Model, Basic Needs Model, New Paradigm of development, Participatory Framework, Right based approach
- Success stories and Innovations in DC
- Growth and transitions in the field of DC -Development Support communication; IEC, BCC, SBCC to SBC; Socio ecological model

## **UNIT III: Media and Development Communication**

**11 Hours**

The Unit focuses on the role of communication systems in development communication. It explores the role of government and other agencies in the field of development communication. The unit highlights the role of different types of media in the arena of development communication.

- DC strategies and communication systems dialogue; scope for participation, engagement and feedback
- Role of Traditional Media in DC
- Development Reporting in India: Print, Electronics and New media
- Role of mass media in DC
- Theories of Press
- Community Media: Types, Role in DC
- Mainstream Media and Digital Media in DC
- Scope of ICTs
- Convergence and partnerships for DC
- Role of Government and other agencies in DC

### **PRACTICAL (Credits 2; Hours 60)**

1. Analysis of development indicators (HDI, GDI, GII, GGI, MPI)
2. Critical analysis of selected development communication initiatives
3. Analyzing and designing print and other media for Development Communication
4. Development Reporting in media across different sectors (Health, Environment etc)
5. Content analysis of mainstream and alternative media

### **Essential Readings:**

- Kumar, K. J. (2000). *Mass communication in India*. New Delhi: Jaico Publishing House, India. ISBN 8172243731.
- McQuail, D. (2010). *Mass Communication Theory*. London: Sage Publications. ISBN 978-1-84920-291-6.
- Melkote, S. & Steeves, L. (2013). *Communication for Development in the Third World*. New Delhi: Sage Publications.
- Narula, Uma. (1994). *Development Communication: Theory and practice*. New Delhi: Har Anand Publications. ISBN 10: 8124101647.
- Pannu, P. & Azaad, Y. T. (2012). *Communication Technology for Development*. International Publishing House Pvt. Ltd, India. ISBN 938057890.
- Servaes, Jan (2008). *Communication for Development and Social Change*. New Delhi,: Sage Publication. DOI: 10.1177/097317411000500110.



- Servaes, J. (2020). *Handbook of Communication for Development and Social Change*. Springer. <https://doi.org/10.1007/978-981-10-7035-8> 2020.
- Waisbord, S. (2003). *Family Tree of Theories, Methodologies and Strategies in Development Communication: Convergences and Differences*. DOI:10.1007/978-981-10-7035-8\_56-1.
- Wilkins, G.K., Tufte, T., & Obregon, R. (2014). *The Handbook of Development Communication and Social Change*. Wiley-Blackwel, ISBN: 978-1-118-50531-1.

**Suggested Readings:**

- Ashford, J. B., LeCroy, C. W., & Lortie, K.L. (2010). *Human Behavior in the Social Environment: A Multidimensional Perspective* (4th ed.). Belmont CA: Wadsworth/Thomson Learning.
- Mefalopulos, Paulo. (2008). *Development Communication Sourcebook- Broadening the Boundaries of Communication*, The World Bank.
- Melkote, R.S., Singhal, A., Shirley, S., & Edna Holt Marston, H. E. (2021). *Handbook of Communication and Development*. Edward Elgar Publishing. ISBN: 978 1 78990 634 9.
- Murthy, D V R. (2006). *Development Journalism, What Next?* New Delhi : Kanishka Publications. ISBN 8173918457.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time**

**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HH 4D1: Pattern Making and Construction**

**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		
Pattern Making and Construction	4	2	0	2	XII Pass	Appeared in Fashion Studies

**Learning Objectives**

- To learn the techniques of pattern making and to judiciously decide the technique required for various designs
- To be able to develop pattern making skills for various garment components
- To be proficient in making patterns in a variety of styles for women's garments

**Learning Outcomes**

- To understand the use and apply the knowledge of tools and terminology used in pattern making the various pattern making tools and its terminology.
- Apply the principles of pattern making for basic upper and lower slopers, sleeves, collars and dresses
- Manipulate the basic slopers to create design variations
- Assemble and complete a dress with all its components
- To develop a keen eye for assessing fit in clothes

**SYLLABUS OF HH 4D1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Pattern Making: Tools and Methods**

**6 Hours**

- This unit enables the students to understand use and apply the knowledge of tools and terminology used in pattern making the various pattern making tools and their terminology also include the various principle and rules of pattern making.
  - Terms and tools for pattern making
  - Various software for pattern making
  - Drafting
  - Flat pattern making
  - Dart manipulation
  - Added fullness

- Contouring
- Rules of pattern making

## **UNIT II: Pattern making for women's wear**

**18 Hours**

This unit helps the students to apply the principles of pattern making for basic upper and lower slopers, sleeves, collars and dresses.

- Development of Basic bodice block, Sleeve block and Skirt block
- Bodice variations: Double darts & multiple darts, Dart cluster, Princess line, Empire line-incorporating appropriate Placket and Pocket
- Sleeve variations: Leg-o-mutton, Petal, Bell, Circular, Shirtmaker
- Collar variations: Peter pan on altered neckline, Partial peter pan, Mandarin, Stand and fall-One piece and Two pieces
- Skirt and waistband variations: A-line, Flared, Gathered, Pleated
- Developing the Torso block: Boxy, Fitted and Semi-fitted

## **UNIT III: Design and Fit**

**6 Hours**

Unit Description: This unit helps to recognize the concept of fit and acquire designing skills for the different figure.

- Body shapes
- Designing for different figure types
- Fit: Fitting area, fitting guidelines, fitting procedure, fitting problem and remedies
- Factors affecting fit, line, ease, grain, set and balance

## **PRACTICAL (Credits 2; Hours 60)**

### **UNIT I: Flat Pattern making:**

In this unit, students will learn the development of basic bodice, sleeve, and skirt slopers along with their variations for women's wear

- Developing basic bodice, sleeve, and skirt slopers
- Developing variations in bodices: Double darts & multiple darts, Dart cluster, Princess line, Empire line
- Yoke variations: basic front & back yoke, back yoke inverted box pleat, added fullness/gathers
- Sleeve variations: Leg-o-mutton, Petal, Bell, Circular, Shirtmaker
- Collar variations: Peter pan on altered neckline, Partial peter pan, Mandarin, Stand and fall (One piece and Two pieces)
- Skirt variations: A-line, Flared, Gathered, Pleated and Waistbands and waist facing
- Pockets and Plackets
  - Pocket: Applied, Inseam and slash
  - Plackets: shirt plackets, continuous wrap, wrap and projection and zipper attachments

### **UNIT II: Construction: Women's wear garment and its components**

This unit equips the students to independently lay patterns, cut fabric and sew a garment

- Construction of a Tunic incorporating appropriate collar, sleeve, placket and pocket using the patterns developed in unit 1
- Construction of a Skirt with an appropriate waistband, zipper attachment using the patterns developed in unit 1

**Essential Readings:**

- Armstrong, H.J. (2009), *Pattern Making for Fashion Design*, Harper Collins Publishers, INC, New York. Chapter 1 pg. 1-22; Chapter 4, 5, 6, 7, 8 & 9
- MacDonald, Nora M. (2010), *Principles of Flat-Pattern Design*, Fairchild Books, New York. Chapter 5 & 6 pg. 117-182; Chapter 9 & 10 pg. 229-282
- Brown, P. and Rice, J. (2014) *Ready to Wear Apparel Analysis*, Fourth Edition. Pearson Education, India
- Mansfield, E. A. & Lucas, E. L., 1953, *Clothing Construction*, Chapter 3, pg 40-58
- Liechty, E.G., Potterberg, D.N., Rasband, J.A., 2010, *Fitting and Pattern Alteration: A Multimethod Approach*, Fairchild Publications, New York. Chapter 1 & 2 pg. 2-62; Chapter 4 pg 64-98
- Aldrich, W. (2008) *Metric Pattern Cutting for Women's Wear*, ISBN 10: 1405175672 / ISBN 13: 9781405175678, Wiley Blackwell Publication.

**Suggested Readings:**

- Dunham, G. R., (2021) *The Fitting Book: Make Sewing Pattern Alterations and Achieve the Perfect Fit You Desire*, ISBN: 9783033083745, Gina Renee Designs Publication, India
- Pepin, H., 1947, *Modern Pattern Design*, Funk and Wagnalls, USA
- Reader's Digest (Eds.). 2002, *New Complete Guide to Sewing*, Reader's Digest Association (Canada) Ltd. Montreal.
- Azad, N., (2019), *Sewing Technology*, Neelkanth Publishers Pvt. Ltd. India.

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HH 4E1: Interior Design**

**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		
Interior Design	4	2	0	2	XII Pass	Appeared in Fundamentals of Resource Management

**Learning Objectives**

- To comprehend the concept of design as applicable to interior spaces.
- To develop proficiency in making working and presentation drawings to be used by interior space design professional.
- To understand the application of materials and finishes for creating aesthetic and sustainable interiors.

**Learning Outcomes**

After completing this course, students will be able to:

- Understand the components of interior design and its application.
- Prepare working and presentation drawings for interiors.
- Critically evaluate different types of materials and finishes for designing interior spaces.

**SYLLABUS OF HH 4E1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Design Fundamental**

**6 Hours**

This unit attempts to introduce the students to the concept of design, elements and principles.

- Design
  - Definition
  - Concept
  - Scope (Inclusive Design, Designing for circular future, Innovative Designs)
- Importance and requirement of good design
- Concept and scope of Interior Design
- Role of an Interior Designer
- Classification of Design: Structural & Decorative

**UNIT II: Advanced Concepts in Interior Design**

**15 Hours**

The unit attempts to give advanced understanding of the concepts of interior design to the

students.

- Application of Elements and Principles to Interior Spaces.
- Theme based Interior designing concepts
- Interior Construction
  - Paneling and Partitions,
  - False ceiling,
  - Electrical systems,
  - Plumbing systems.

### **UNIT III: Historical and Contemporary Trends in Interior Design**

**9 Hours**

The unit introduces the students to historical and contemporary trends in Interior design.

- History of Architectural Design
- Historical and Contemporary Design Styles
- Vernacular Architecture
- Recent trends in design: Bio-Mimicry, Bio-philic

### **PRACTICAL (Credits 2; Hours 60)**

1. Basic drawing techniques
2. Concept of Scale
3. Lettering
4. Concept Sheets and Mood Boards
5. Introduction to Computer Aided Drawings
6. Drawing and identification of common symbols
7. Drawing 1 BHK, floor plans and elevations
8. Rendering Techniques
9. Application of rendering in plans
10. Project / Portfolio (Innovative designs, materials and technologies for Interiors)

#### **Essential Readings:**

- Faulkner, S. & Faulkner, R. (1954). *Inside Today's Home*, Rinehart Publishing Company.
- Goldstein, H. and Goldstein, V. (1988). *Art in Everyday Life* (4th. ed), Oxford: IBH Publishing Co.
- Grimley, C. and Love, M. (2018). *The Interior Design Reference & Specification Book*, Rockport Publishers.
- Mitton, M. and Nystuen, C. (2021). *Residential Interior Design: A Guide to Planning Spaces* (4th. ed), Wiley
- Rao, M.P. (2020). *Interior Design Principles and Practices*, Standard Publishers Distribution.

#### **Suggested Readings:**

- Lawrence M. (1987). *Interior Decoration*, Chartwell Books.
- Mogg, C. C. (1995). *The Complete Home Decorator*, Portland House.
- Riley & Bayen. (2003). *The Elements of Design*, Free Press.
- Seetharaman P. and Pannu, P. (2001). *Interior Design & Decoration*, CBS publishers.
- Thompson, J. A. A. and Blossom, N. (Ed). (2015), *The Handbook of Interior Design*, Wiley.

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## **DEPARTMENT OF HOME SCIENCE**

### **Semester – V**

#### **B.Sc. (Honours) Home Science**

#### **DISCIPLINE SPECIFIC CORE COURSE**

#### **DSC HH 513: Human Development III: The Adulthood Years**

#### **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		
Human Development III: The Adulthood Years	4	3	0	1	XII Pass	Appeared in Human development II: Middle Childhood and Adolescence

#### **Learning Objectives**

- To develop an understanding of different domains of development in adulthood
- To gain an understanding of how socio-cultural contexts shape development during adulthood
- To utilize a range of techniques to study different domains of development in adulthood

#### **Learning Outcomes**

Students will be able to:

- To describe different domains of development in adulthood : physical, cognitive, language and socio-emotional
- To understand development in adulthood in varied contexts and cultures
- To develop competency in the use of different techniques for studying various domains of development in adulthood

#### **SYLLABUS OF DSC HH 513**

#### **THEORY (Credits 3; Hours 45)**

#### **UNIT I: Understanding Young Adulthood**

**15 Hours**

- Physical and physiological changes
- Cognitive development
- Socio-emotional development- relationships and marriage

- Careers, work and leisure
- Gender and sexuality in Indian context

## **UNIT II: Development during Middle Adulthood**

**15 Hours**

- Definition, developmental tasks of middle adulthood
- Physical changes, health and well-being
- Cognitive development and changes
- Social and emotional development-relationships and family dynamics, marital satisfaction and parenting

## **UNIT III: Aging in Late Adulthood**

**15 Hours**

- Developmental tasks of late adulthood
- Physical and physiological changes associated with aging and health concerns
- Cognitive development: changes in cognitive abilities
- Socio-emotional development-grand parenting, social support networks, work and retirement, leisure and overall well-being
- Culture, religion and spirituality
- Death and grief

### **PRACTICAL**

**(Credits 1; Hours 30)**

1. To study development during adulthood using multimedia resources.
2. Case profile of an individual in middle/late adulthood
3. Use of interview/questionnaire method to study adult roles (at least one male and one female)
  - Father/ Husband
  - Homemaker
  - Employed woman
  - Single parent
  - Grandfather/ grandmother
  - Retired person
4. Journaling in young adulthood
5. Visit to an old age home
6. Study psychological tests of intelligence and personality- any three

### **Essential Readings:**

- Berk, L.E. (2007). Development through the lifespan. Delhi: Pearson Education.
- Papalia, D.E. and Martorell, G. (2015). Experience Human Development. McGraw Hill Education.
- Ranganathan, N.(Ed.).2020. Understanding Childhood and Adolescence. New Delhi: Sage
- Santrock, J.W. (2007). A Topical Approach to Lifespan Development. New Delhi: Tata McGraw-Hill.
- Singh, A. (Ed). 2015. Foundations of Human Development: A Lifespan approach. New Delhi: Orient Black Swan.

### **Suggested Readings:**

- Sharma, N. (1999). Understanding Adolescence. National Book Trust.



- Rice. F. P. (1998). Human Development: A lifespan approach. New Jersey: Prentice Hall.
- Rutter, M. and Rutter, M. (1992). Developing Minds: Challenge and continuity across the lifespan. London: Penguin.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch,  
University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC CORE COURSE**  
**DSC HH 514: Dietetics and Public Health Nutrition I**

**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		
<b>Dietetics and Public Health Nutrition I</b>	<b>4</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>XII Pass</b>	<b>Appeared in Nutrition: A Life Cycle Approach</b>

**Learning Objectives**

- To explain the importance and scope of public health nutrition and its role in the health care system.
- To develop skills for using various methods and techniques for assessing nutritional status.
- To familiarize with the National public health nutrition concerns
- To develop an understanding about the principles of dietetics and nutrition care.
- To apprise the various aspects related to management of some common disorders / diseases.
- To inculcate the skill of dietary intervention according to patients' nutritional assessment and diagnosis.

**Learning Outcomes**

- Understand the concept of public health nutrition and its role in the health care system.
- Comprehend and use various methods and techniques for assessment of nutritional status assessment at individual and community level.
- Gain knowledge of the current National nutritional concerns.
- Understand the principles of the nutrition care process in hospital settings in the management of diseased person.
- Ability to modify normal diets as per the therapeutic condition.

**SYLLABUS OF DSC HH 514**

**THEORY**

**(Credits 3; Hours 45)**

**UNIT I: Public Health Nutrition and Health Care Systems**

**8 Hours**

- Definition and multidisciplinary nature of public health nutrition
- Concept, scope and current concerns in public health nutrition
- Health – Concept, definition, dimensions, determinants and indicators
- Health care systems:

- Levels of Health Care
  - Health Care System, Health care delivery system in India
  - Role of Public Health sector and other sectors and agencies
  - Primary Health care in India
  - Role of important schemes and institutions
- Role of public health nutritionist in health nutrition

## **UNIT II: Assessment of Nutritional Status**

**8 Hours**

- Objectives and importance of assessment of nutritional status of individual and population groups
- Methods of Assessment of Nutritional status of Individual and Population groups
  - Anthropometry and related measures
  - Biochemical Assessment
  - Clinical Examination
  - Dietary Assessment
  - Vital Statistics, Ecological factors and Qualitative Assessment Methods- An overview

## **UNIT III: National Public Health Nutrition Concerns**

**8 Hours**

- Prevalence, etiology, clinical features, prevention and management at community level of the following:
  - Protein Energy Malnutrition, Moderate Acute Malnutrition , Severe Acute Malnutrition
  - Micronutrient deficiencies such as Vitamin A deficiency, Nutritional anemia, Iodine deficiency disorders, Vitamin D deficiency and Zinc deficiency
  - Fluorosis
  - Obesity, Metabolic Syndrome and Non communicable disease- An overview

## **UNIT IV: Principles of Nutrition Care**

**4 Hours**

- Nutrition Care Process
- Therapeutic adaptations of a Normal Diet, Progressive diets

## **UNIT V: Etiology, patho-physiology, metabolic changes, clinical features and nutritional**

### **management of**

**17 hours**

- Infection and Fevers- Typhoid, Tuberculosis, HIV-AIDS, Malaria/Dengue/Chikungunia
- G I Tract disorders- Diarrhea, Constipation, Lactose Intolerance, Celiac disease\
- Weight management- Underweight, overweight and obesity
- Eating Disorders

## **PRACTICAL (Credits 1; Hours 30)**

1. Assessment of nutritional status:

- Anthropometry (height, weight , Middle upper arm circumference , Waist circumference )
  - Dietary Assessment - Food frequency questionnaire ,24 hour dietary recall
  - Review of nutritional status of population from National /Regional/ Nutrition Surveys (NFHS, CNNS, etc)
2. Planning and preparation of low cost nutritious diet/ recipes for population groups vulnerable to nutritional deficiency diseases (PEM, Nutritional Anemia, Vitamin A deficiency)
  3. Therapeutic modifications of diets:
    - Normal, soft, clear- and full- fluid
  4. Planning and preparation of diets/dishes for individuals suffering from:
    - Febrile disorders- Typhoid, Tuberculosis
    - GI Tract disorders- Diarrhoea and Constipation
    - Weight management- Underweight, overweight/ obesity

### **Essential Readings:**

- Siddhu A, Bhatia N, Singh K, Gupta S (2017). Compilation of food exchange list, Technical Series 6, Lady Irwin College, University of Delhi. Publ. Global Books Organisation, Delhi
- Vir, S. (2023). Child, adolescent and women nutrition in India: Public Policies, programme and progress. KW Publishers, Daryaganj, New Delhi, India.
- Seth V, Singh K and Mathur P (2018). Diet Planning through the Life Cycle: Part 1 Normal Nutrition. A Practical Manual. 6 th Edn. Elite Publishing House Pvt. Ltd. New Delhi.
- Seth, V. and Singh K. (eds.) (2021) Principles of Medical Nutrition Therapy for Positive Clinical Outcomes, 1<sup>st</sup> Edition. Elite Publishing House Pvt. Ltd.
- Bamji MS, Krishnaswamy K and Brahmam GNV (Eds) (2016). Textbook of Human Nutrition, 4th edition. Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi
- Indian Dietetics Association, (2018) Clinical Dietetics Manual, 2nd Edition. Elite Publishing House Pvt. Ltd.
- Gibney, M. J., Margetts, B. M., Kearney, J. M. & Arab, L. (Eds.). (2005). Public Health Nutrition. Oxford, UK: Blackwell Science.
- Longvah T, Ananthan R, Bhaskarachary K and Venkaiah K (2017). Indian Food Composition Tables. National Institute of Nutrition, ICMR, Hyderabad.
- ICMR (2020) Estimated Average Requirements and Recommended Dietary Allowances for Indians .Published by National Institute of Nutrition, Hyderabad.

### **Suggested Readings:**

- Chadha R and Mathur P eds.(2015) Nutrition : A Lifecycle Approach. Orient Blackswan, New Delhi.
- Wadhwa A. and Sharma S (2003). Nutrition in the Community-A Textbook. Elite Publishing House Pvt. Ltd. New Delhi
- ICMR (2011) Dietary Guidelines for Indians. Published by National Institute of Nutrition, Hyderabad.

- Khanna K, Gupta S, Seth R, Passi SJ, Seth R, Mahna R, Puri S (2013). Textbook of Nutrition and Dietetics. 2nd Edn. Phoenix Publishing House Pvt. Ltd.
- Mahan, L.K. & Escott Stump, S. (2020). Krause's Food & Nutrition Therapy, 15th ed. Saunders Elsevier
- Jelliffe DB & Jelliffe E F P (1989). Community nutritional assessment with special reference to less technically developed countries. Oxford Medical Publications. Oxford University Press, Oxford, UK.
- Joshi, S.A. (2015). Nutrition and Dietetics, 4th ed. Mc Graw Hill education.
- WHO information on Dengue/ Chikungunia/ Malaria  
Dengue- <https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue>. Assessed on March 2023  
Chikungunia-<https://www.who.int/news-room/fact-sheets/detail/chikungunya>. Assessed on March 2023  
Malaria- <https://www.who.int/news-room/fact-sheets/detail/malaria>. Assessed on March 2023
- WHO <https://www.who.int/tools/child-growth-standards/standards> Assessed on March 2023
- WHO (2009) <https://www.who.int/publications/i/item/9789241547635>. Assessed on March 2023
- [http://www.ilsindia.org/Workshop\\_National\\_Food\\_Consumption\\_Anthropometry\\_Physical\\_Activity\\_Survey/Methodology.pdf](http://www.ilsindia.org/Workshop_National_Food_Consumption_Anthropometry_Physical_Activity_Survey/Methodology.pdf). Assessed on March 2023
- [https://nhm.gov.in/images/pdf/programmes/wifs/operational-framework-wifs/operational\\_framework\\_wifs.pdf](https://nhm.gov.in/images/pdf/programmes/wifs/operational-framework-wifs/operational_framework_wifs.pdf). Assessed on March 2023
- WHO <https://www.who.int/tools/child-growth-standards/standards>. Assessed on March 2023
- WHO (2009) <https://www.who.int/publications/i/item/9789241547635>. Assessed on March 2023
- [https://www.nin.res.in/tenders/DABS/2.Anthro\\_BP\\_Dec\\_1\\_2022.pdf](https://www.nin.res.in/tenders/DABS/2.Anthro_BP_Dec_1_2022.pdf). Assessed on March 2023
- [https://nhm.gov.in/images/pdf/programmes/wifs/operational-framework-wifs/operational\\_framework\\_wifs.pdf](https://nhm.gov.in/images/pdf/programmes/wifs/operational-framework-wifs/operational_framework_wifs.pdf). Assessed on March 2023
- National Nutrition Monitoring Bureau (India) | GHDx ([healthdata.org](http://healthdata.org)). Assessed on March 2023
- NFHS Project | International Institute for Population Sciences (IIPS) ([iipsindia.ac.in](http://iipsindia.ac.in)). Assessed on March 2023

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University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC CORE COURSE**  
**DSC HH 515: Psycho-Social Dimensions of Family and Community**

**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		
Psycho-Social Dimensions of Family and Community	4	2	0	2	XII Pass	NIL

**Learning Objectives**

- To develop a fundamental understanding of the dynamics of the family systems.
- To understand the various community systems and their functioning.
- To comprehend various psychosocial influences on families and communities.

**Learning Outcomes**

- Students will be able to:
- Understand the multifaceted nature of families and communities.
- Gain awareness of the changing structure, roles and expectations of families and communities in the present times.
- Gain in-depth knowledge of coping strategies and support mechanisms to empower families and communities.

**SYLLABUS OF DSC HH 515**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Understanding Family Systems**

**10 Hours**

- Dynamics of family structure and function
- Demographic and cultural variations
- Continuities and change in contemporary families: changing roles, expectations and identities; single parent/divorce/co-parenting; dealing with the loss of a family member or chronic illness.

**UNIT II: Understanding Community Systems**

**10 Hours**

- The concept of communities, evolution and types: Rural, urban, tribal, small town; meaning, characteristic features and growth in the communities.
- Community and social relationships: Everyday lives, conflict and crises, transitions
- Continuities and change in community systems.

### UNIT III: Psychosocial Dimensions

10 Hours

- Local and global influences on families and communities
- Stressors and coping mechanisms, risk and protective factors
- Care and support mechanisms in family and community setting: childcare support, youth support groups, elderly care
- Families and communities as ecologies of resilience: negotiating migration, conflict/war zones, displaced or stateless situations, and natural disasters.

#### PRACTICAL (Credits 2; Hours 60)

1. Interviews and focus group discussions to study the changing structure, roles, and expectations of the family: relationships with parents, grandparents, and siblings.
2. Understanding changing family and community dynamics through Movies/Documentaries
3. Understanding stressors and coping strategies among individuals through interview technique.
4. Understanding local/global influences and coping mechanisms in a traditional community (artisans/potters/folk musicians) using interviews and observations.
5. Using audio-visual materials to understand how human behaviour influences our self, psyche, and group relationships.
6. Workshop/lecture on building resilience and coping mechanisms.

#### Essential Readings:

- Abraham, F. (2006). *Contemporary Sociology: An Introduction to concepts and Theories*. Oxford University Press.
- Anand, V., Balakrishnan, G., & George, P. (2018). *Community practices in India: Lessons from the grassroots*. Cambridge Scholars Publishing.
- Maguire, K. (2012). *Stress and coping in Families*. Wiley.
- Sachdeva, P., & Florence, D. (2020). *Basic Sociology*. Elite Publishing House.
- Shah, M. A. (2014). *The Writings of A. M. Shah: The Household and Family in India*. Orient Blackswan.
- Thibaut, J. W., & Kelley, H. H. (2017). *The social psychology of groups*. Routledge.
- Ungar, M. (2021). *Multisystemic resilience: Adaptation and transformation in contexts of change*. Oxford University Press.

#### Suggested Readings:

- Compas, B. E., Murphy, L. K., Yarboi, J., Gruhn, M. A., & Watson, K. H. (2019). Stress and coping in families. In B. H. Fiese, M. Celano, K. Deater-Deckard, E. N. Jouriles, & M. A. Whisman (Eds.), *APA handbook of contemporary family psychology: Foundations, methods, and contemporary issues across the lifespan* (pp. 37–55). American Psychological Association. <https://doi.org/10.1037/0000099-003>.
- Hochschild, A. (2013). *So how's the Family? And other Essays*. University of California Press.
- Madan, T. N. & Das, Veena. (2003). *The Oxford India companion to sociology and social anthropology*. Oxford University Press
- Passer, M.W. & Smith, R.E. (2010). *Psychology: The science of mind and behaviour*. Tata McGraw-Hill.

- Stockholm Resilience Centre. (2015). Applying resilience thinking: Seven principles for building resilience in social-ecological systems.  
<http://stockholmresilience.org/download/18.10119fc11455d3c557d6928/1459560241272/SRC+Applying+Resilience+final.pdf>
- Trawick, M. (1996). *Notes on Love in a Tamil family*. Oxford University Press.

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HH 5A1: Children with Disabilities**

**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		
Children with Disabilities	4	2	0	2	XII Pass	Appeared in Human development II: Middle Childhood and Adolescence

**Learning Objectives**

- To understand the varied perspectives on disability.
- To know major types of disabilities, the causes, prevention, characteristics of the disabilities and barriers which persons with disability face.
- To understand importance of early identification and early intervention, and inclusion.

**Learning Outcomes**

- Students will be able to understand various perspectives on disability and ways of preventing disability.
- Students will acquire skills in Early identification of childhood disability and etiology of a wide range of disabilities.
- Student will understand inclusive practices for including children with disability in classrooms.

**SYLLABUS OF HH 5A1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Understanding Disability\ 6 Hours**

- Definition and concept of disability
- Perspectives and models of Disability
- Linking disability to milestones
- Prevention of Disability

**UNIT II: Types of Disability**

**14 Hours**

Etiology and types and early identification of following disabilities

- Locomotor Disabilities
- Intellectual Disability
- Sensory disability-Visual and auditory

- Learning Disability
- Autism Spectrum Disorder

### UNIT III: Disability and Society

10 Hours

- Understanding inclusive practices
- Significance of early intervention
- Role of families of children with disability
- Legal provisions

### PRACTICAL (Credits 2; Hours 60)

1. Focus Group discussion on the listing of disabilities and innovations for PwD in community and school teaching
2. Visit to organizations working with and for children with disabilities (CGC, Inclusive Schools, Resource Rooms, NGOs, Hospitals)
3. Observation of children with disability in classrooms
4. Exploring audio visual resources with reference to children with disability and their families
5. Survey of public space to gauge accessibility for PwD
6. Preparing pamphlets/posters to create awareness about rights of PwD
7. Preparing developmental checklists for assessing developmental delays
8. Case profile of a child with disability/of an organization working with children with disability
9. Planning developmentally appropriate material for children with disabilities.
10. Select psychometric tests- Disability screening schedule, Portage guide for early intervention, Tests for Learning Disability

### Essential Readings:

- Chopra, G. (2015). *Child rights in India: Challenges and social action*. New Delhi: Springer (India) Pvt. Ltd.
- Chopra, G. (2012). *Early Detection of Disabilities and persons with disabilities in the community*. New Delhi: Engage publications
- Chopra, G. (2012). *Stimulating Development of Young Children with Disabilities at Anganwadi and at Home: A Practical Guide*. New Delhi: Engage publications.
- Chopra, G. (2011). *Mother and child care: Promoting health, preventing disabilities*. New Delhi: Engage publications
- Heward, W.L., (Ed) (2000). *Exceptional children: An introduction to special education*. New Jersey: Prentice-Hall Inc.
- Mangal, S. K. (2007). *Exceptional children: An introduction to special education*. New Delhi: Prentice Hall of India
- Sharma, N. (Ed) (2010). *The Social Ecology of Disability-Technical Series - 3*, Lady Irwin College. Delhi: Academic Excellence
- The Rights of Persons with Disabilities Act, 2016.  
<http://scpdodisha.nic.in/sites/default/files/Gazette%20Notification%20%20of%20PwD%20Act%202016.pdf>

### Suggested Readings:

- Draft National policy for Persons with Disability (2022)  
<https://disabilityaffairs.gov.in/upload/uploadfiles/files/Draft%20Copy%20New%20National%20Policy%20May%202022%20.pdf>. Accessed in March 2023.

- Jangira, N.K. (1997) “Special Educational Needs of Children and Young Adults: An Unfinished Agenda,” *Education and Children with Special Needs: From Segregation to Inclusion*, Ed. Seamus Hegarty, MithuAlur, Thousand Oaks: Sage Publications Inc.
- Karna, G. N. (1999). *United Nations and rights of disabled persons: A study in Indian perspective*. New Delhi: A.P.H. Publishing Corporation.
- Mani, R. (1988). *Physically handicapped in India*. Delhi: Ashish Publishing House.
- Mastropieri, M. A., & Scruggs, T. E. (2004). *The inclusive classroom: Strategies for effective instruction*. NY: Pearson.
- Werner, D. (Ed) (2018). *Disabled village children: A guide for community health workers, rehabilitation workers, and families*. United States of America: Hesperian Health Guides

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University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HH 5A2: Childhood in India**

**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		
Childhood in India	4	2	0	2	XII Pass	Appeared in Human development II: Middle Childhood and Adolescence

**Learning Objectives**

- To study the concept of multiple childhoods in India
- To understand the social and cultural dimensions of childhood in India
- To know/ appreciate the diverse contexts of childhood

**Learning Outcomes**

The students will:

- Understand the meaning of multiple childhoods and various views about it
- Appreciate children's experiences of ethnicity, class, caste, religion, and gender
- Learn about multiple contexts of development for children and diverse childhood experiences

**SYLLABUS OF HH 5A2**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT 1 Conceptualizing Childhood in India 10 Hours**

- Construction of childhoods in India: Social and cultural dimensions; historical and political influences
- Folk theories of childhood
- portrayal in mythology, stories and films

**UNIT 2 Understanding Multiple Childhoods: Growing up in Diverse Social Contexts 10 hours**

- Growing up in familial and extra-familial settings
- Childhood in families
- Childhood in schools
- Childhood in rural and tribal communities

### UNIT 3 Contemporary Issues of Childhood in India

10 Hours

- Childhood through the lens of social class, caste, gender, and religion
- Demographic profile in relation to diversity and childhoods
- Poverty and disadvantage, children in street situations
- Gendered childhoods/ transgender childhood

#### PRACTICAL (Credits 2; Hours 60)

1. Using the model of developmental niche, prepare an autobiographical narrative of childhood, elaborating on the impact of the different settings on your experience as a child.
2. Observation and documentation of children in different socio-cultural settings
3. Construct and conduct an Interview schedule (Structured/ Semi structured) to understand beliefs of children, folk lore, folk song, toys and games for diverse ethnic groups.
4. Exploring diverse Indian childhood context
  - Audio-Visual aids: Movies and documentaries
  - Documentation: Images, visual and print sources
5. Workshops/ lecture/ seminar to understand the diverse contexts of growing up in India.
6. Case profile of children with disability/working children/ children in street situations
7. Develop a conceptual map/audit trail to depict the childhoods in India using secondary sources
8. Visit to Museum at the Department of Anthropology/Craft Museum/National Museum: for documenting artifacts/ play material/clothes/ any tangible material on display used by or for children

#### Essential Readings:

- Behera, D. K. (Ed.). (2007). *Childhoods in South Asia*. Pearson Education India.
- Jenks, C. (2020). *Childhood*. Routledge.
- Joshi, P., & Shukla, S. (2019). *Child development and education in the twenty-first century*. Springer. <https://doi.org/10.1007/978-981-13-9258-0>
- Kaur, R. (2022). *Constructions of Childhood in India: Exploring the Personal and Sociocultural Contours*. Routledge.
- Saraswathi, T. S., Menon, S., & Madan, A. (Eds.). (2017). *Childhoods in India: Traditions, trends and transformations*. Taylor & Francis.
- Sharma, D. (2003). *Infancy and childhood India*. In D. Sharma (Ed.), *Childhood, family and socio-cultural changes in India*. Oxford.
- Thapan, M. (Ed.). (2014). *Ethnographies of schooling in contemporary India*. SAGE Publications India.

#### Suggested Readings:

- Balagopalan, S. (2019). Afterschool and during vacations: On labor and schooling in the postcolony. *Children's Geographies*, 17(2), 231-245. <https://doi.org/10.1080/14733285.2018.1490008>
- Balagopalan, S. Introduction: Children's lives and the Indian context. *Childhood*, 18(3), 291–297. doi:10.1177/0907568211413369
- Sharma, D. (2000). Infancy and childhood in India: A critical review.

*International Journal of Group Tensions*, 29, 219–251.

<https://doi.org/10.1023/A:1026521211796>

- Thapan, M. (2022). Dalit Autobiographies as Counter Publics: An Exploratory Essay. *South Asia Multidisciplinary Academic Journal*, 28. <https://doi.org/10.4000/samaj.7910>
- Sarangapani, P. (2003). Childhood and Schooling in an Indian Village. *Childhood*, 10(4), 403–418. doi:10.1177/0907568203104002.

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### DISCIPLINE SPECIFIC ELECTIVE DSE HH 5B1: Nutritional Biochemistry I

#### 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		
Nutritional Biochemistry I	4	2	0	2	XII Pass	Appeared in Physical Science for Home Science

#### Learning Objectives

- To provide basic concepts of biomolecules, the basic building blocks vital for various life forms
- To focus on key structures, properties and biological functions of biomolecules

#### Learning Outcomes

- Gain knowledge on structure-function relationship of biomolecules
- Developing an insight into biochemical role and significance of carbohydrates, proteins, lipids, nucleic acids, vitamins and minerals

### SYLLABUS OF HH 5B1

#### THEORY (Credits 2; Hours 30)

#### UNIT I: Carbohydrates

6

##### Hours

This unit lays emphasis on classification, structures and properties of carbohydrates.

- Introduction, definition and classification

- Structures of monosaccharides (glucose, fructose, galactose, ribose) and disaccharides (maltose, lactose, sucrose)
- Homopolysaccharides-structures and functions (dextrin, starch, glycogen)
- Stereoisomerism of monosaccharides (Keto-aldo, D- and L-isomerism, optical isomerism, epimerism, anomerism), mutarotation

## **UNIT II: Lipids**

**6 Hours**

This unit highlights on classification, structures and biochemical functions of fatty acids and lipids.

- Introduction and structure of fatty acids (saturated and unsaturated)
- Essential and non-essential fatty acids
- Definition, classification and function of lipids (storage lipids-triacylglycerols; Membrane lipids-phospholipids and sphingolipids)

## **UNIT III: Amino acids and Proteins**

**5 Hours**

This unit covers structures and classification of amino acids. The unit also discusses basic concepts of structural organization in proteins.

- Introduction, definition, classification and structure of standard amino acids
- Essential and non-essential amino acids
- Peptide bond-nature, conformation and dihedral angles psi and phi
- Structure of proteins-primary, secondary (alpha-helix, beta-sheets and beta-turns), tertiary and quaternary

## **UNIT IV: Nucleic Acids**

**6 Hours**

The unit focuses on structures, biological functions and significance of nucleic acids.

- Introduction and structure of nucleosides and nucleotides
- DNA structure (B-form) and functions
- RNA structure and functions (mRNA, tRNA and rRNA)

## **UNIT V: Vitamins and Minerals**

**7 Hours**

This unit covers structures and biochemical functions of vitamins along with biological role and significance of minerals.

- Definition and classification of vitamins
- Structure and biochemical role of fat soluble vitamins-A and D
- Structure and biochemical role of water soluble vitamins- Thiamine, Riboflavin, Niacin, Pyridoxine and Ascorbic acid.
- Biological role and occurrence of inorganic elements – iron, calcium, phosphorous, iodine, selenium and zinc.

## **PRACTICAL (Credits 2; Hours 60)**

1. Qualitative tests for monosaccharides, disaccharides and polysaccharides.
2. Identification of monosaccharides, disaccharides and polysaccharides in unknown mixtures.
3. Quantitative estimation of glucose, sucrose and lactose by titrimetric method.
4. Qualitative tests for amino acids.
5. Qualitative analysis of DNA by diphenyl amine reagent.
6. Qualitative analysis of RNA by orcinol reagent.

7. Estimation of ascorbic acid using 2,6 dichlorophenol indophenol method in the given solution.
8. Estimation of calcium using EDTA by titration.

**Essential Readings:**

- Kennelly, P. J., Botham, K. M., McGuinness, O., Rodwell, V. W., Weil, P.A., 2022, *Harper's Illustrated biochemistry* (32nd ed.). McGraw-Hill Education.
- Nelson, D. L., Cox, M. M., 2017, *Lehninger Principles of Biochemistry* (7th ed.). W H Freeman & Co.
- Satyanarayana, U., Chakrapani U., 2021, *Biochemistry* (6th ed.). Elsevier.
- Sundararaj, P., Siddhu, A., 2002, *Qualitative tests and Quantitative Procedures in Biochemistry* (2nd ed.). New Delhi: A. H. Wheeler and Co Ltd.

**Suggested Readings:**

- Voet, D., Voet, J.G., 2012, *Principles of Biochemistry* (4th ed.). Wiley.
- Devlin, T.M. 2010, *Textbook of Biochemistry with Clinical Correlations* (7th ed.). New York, John Wiley-Liss.
- West, E.S., Todd, W.R., Mason, H.S., Bruggen J.T.V., 2017, *Textbook of Biochemistry* (4th ed.). Oxford & IBH.

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University of Delhi, from time to time.**



**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HH 5B2: Social and Cultural Aspects of 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		
Social and Cultural Aspects of Nutrition	4	2	0	2	XII Pass	Appeared in Food Science and Nutrition

**Learning Objectives**

- To understand the relationship between socio-cultural aspects of food and nutrition in the historical and current context.
- To gain an insight of the social and cultural influences on food choices and diet-related behaviour.
- To recognize and appreciate the importance of cultural knowledge in nutrition.

**Learning Outcomes**

- Understand the social and cultural significance of food and its integration with the biological aspects.
- Comprehend the historical perspective and current dietary practices and food consumption patterns across cultures.
- Appreciate the social and cultural influences on food choices and diet-related behaviour.
- Recognize the importance of culture-sensitive dietary advice and guidance.

**SYLLABUS OF HH 5B2**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Food, Nutrition and Culture**

**12 Hours**

This unit deals with social and cultural significance of food and its integration with biological aspects of food and nutrition, and the historical perspective and current dietary practices, concerns and food consumption patterns. It also includes the cross-cultural differences and acculturation in food behaviour.

- Ethnological Perspectives on Role of Food - Social and cultural significance of food
- Integrating Biological and Socio-Cultural Aspects of Food and Nutrition
- Indian Perspective on Anthropology of Food: An Overview
- Dietary Practices and Food Consumption Pattern

- Historical perspective
- Current dietary practices, concerns and health-related issues
- Cross-cultural differences and eating behaviour
- Cultural Integrity and Acculturation in relation to Food Choices

## **UNIT II: Social and Cultural Influences on Food Choices and Diet-Related Behaviour**

**12 Hours**

This unit deals with the role of food environment, especially socio-cultural practices, as well as demographic and other factors in determining food behaviour. It also includes culture-specific food taboos for vulnerable groups and socio-cultural influences on sustainable healthy diets.

- Relation of Food Environment with Food Choices and Dietary Practices
- Significance of Social Structures, Socio-demographic factors, Cultural practices, Religious structures and Policy
- Culture-specific foods and taboos for feeding children, adolescents, pregnant and nursing mothers
- Socio-cultural influences on sustainable healthy diets

## **UNIT III: Importance of Cultural Knowledge in Nutrition**

**6 Hours**

This unit deals with the importance of cultural knowledge in influencing food behaviour and culture-specific dietary advice.

- Influencing change in Food Choices and Dietary Patterns
- Cultural Interpretation of Malnutrition
- Culture-sensitive dietary advice and guidance

## **PRACTICAL (Credits 2; Hours 60)**

### **Activities/Project on:**

- Staple foods/ethnic cuisines in different regions of India/across the Globe
- Traditional foods for special occasions in different cultures
- Food habits and dietary patterns of individuals following different religions
- Food habits and dietary patterns of migrants in comparison with their traditional eating behaviour
- Food waste behaviour in different cultures
- Infant and young child feeding and nutrition - Regional diets during pregnancy and variations in feeding during infancy and childhood
- Globalization and its effect on food environment and dietary practices

### **Essential Readings:**

- Dufour, D.L., Goodman, A.H. and Pelto, Gretel H. (2012). Nutritional Anthropology: Biocultural Perspectives on Food and Nutrition. 2<sup>nd</sup> Edition. Oxford University Press.
- Gibney, M.J., Margetts, B.M., Kearney, J.K., & Arab, L. (Eds.) (2004). Public Health Nutrition. Wiley-Blackwell.
- Nambiar, V. (2021). Indian Food Anthropology and the Eat Right Movement. Volume I & II. Selective & Scientific Books, New Delhi.

#### **Suggested Readings:**

- Achaya, K.T. (1998). Indian Food. Oxford.
- Antani, V., Mahapatra, S. (2022). Evolution of Indian cuisine: a socio-historical review. *J. Ethn. Food*, 9, 15. <https://doi.org/10.1186/s42779-022-00129-4>
- Farb, P. and G. Armelagos. (1980). Consuming Passions: The Anthropology of Eating. Houghton Mifflin Harcourt.
- Germov, J. & Williams, L. (Eds.). (2009). A Sociology of Food and Nutrition: The Social Appetite. 3<sup>rd</sup> Edition. Oxford University Press.
- Harris, M. (1987). Foodways: historical overview and theoretical prolegomenon. In: Harris, M. and E. B. Ross (eds.) Food and Evolution: Toward a Theory of Human Food Habits. Philadelphia: Temple University Press.
- Higman, B.W. (2011). How Food Made History. 1<sup>st</sup> Edition. Wiley-Blackwell.
- Le, S. (2018). 100 Million Years of Food: What Our Ancestors Ate and Why It Matters Today. Reprint Edition. Picador.
- McIntosh, Wm. A. (1996). Sociologies of Food and Nutrition. Springer New York.
- McWilliams, M. (2010). Food Around the World: A Cultural Perspective. Second Edition. Pearson Education.
- Seal, PP. (2023). Food Anthropology in India. Routledge India.
- Sidney, C.H.C. & Tan, C. (2007). Food and Foodways in Asia: Resource, Tradition and Cooking. 1<sup>st</sup> Edition. Routledge.

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HH 5C1: Gender, Media and Society**

**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		
<b>Gender, Media and Society</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>XII Pass</b>	<b>Appeared in Communication Concepts and Theories</b>

**Learning Objectives**

- To sensitize students to the gender dynamics operating in societies and their impact on overall development at regional and national level.
- To understand the gender-based differentials in terms of socio-cultural constraints, deprivations and violence faced by men and women during their life cycle and the legal redressal available.
- To make students appreciate the inter-linkages between gender, media and society and how media can play an important role in promoting Gender equity.

**Learning Outcomes**

- The students will understand and internalize the concepts of sex and gender and how various socio-economic-cultural-political practices impact the construction of gender.
- The students will develop appreciation of inter-relationships between gender equality/equity on one hand and gender and development based indicators on the other.
- The students will be able to appreciate the dimensions, theories and approaches of women empowerment.
- The students will be enabled to critique the role of media in promoting gender equality and equity.

**SYLLABUS OF HH 5C1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Understanding Gender and Perspectives on Women's Status**

**8 Hours**

This unit elucidates upon the concept of gender, sex and LGBTQA+ identities. It elaborates on the status of women across ages and the shifts across various social orders.

- Concept of gender, differences between sex and gender

- LGBTQA + Binary and Non Binary identities: Concept, intersection with other gender identities, challenges, activist trends, initiatives by the Government
- Status of women- definition, quantification; shifts in status of women – historical and contemporary perspectives
- Patriarchal and matriarchal social order and impact on women's status

## **UNIT II: Gender and Development**

**14 Hours**

This unit elaborates on the inter-relationships between Gender and Development as well as gender-based differentials in various sectors and their measurement. It also elaborates on the violence faced by women across various life cycle and the various legal provisions available for the same.

- Inter-relationships of Gender and Development; Gender differentials in health/nutrition, education, economic and political participation
- Indices of Human and Gender development with special reference to India's position
- Life Cycle Approach to gender studies; violence faced by women at different life stages (Domestic violence, Sex selection practices, Sexual Harassment at work place);
- Legal provisions available for dealing with such violence
- Empowerment of vulnerable groups including women- Economic, social and political dimensions of empowerment.

## **UNIT III: Gender, Media and Impact on Society**

**8 Hours**

This unit elaborates on media's role in construction of gender, representation of women in media and gender stereotypes. It also focuses on framework for gender responsive media and gender mainstreaming.

- Social construction of gender reality by contemporary media
- Media and perpetuation of gender stereotypes
- Representation of women in media in political, cultural and social landscape
- Gender and media ethics
- Framework for gender responsive media and gender mainstreaming, ICTs and Gender

## **PRACTICAL (Credits 2; Hours 60)**

1. Understanding the concept of sex and Gender
  - Quiz/games on sex and gender
2. Gender based Indices
  - Studies of gender-based indices with reference to Indian context
  - Research studies on issues linked to Gender
3. Portrayal of gender in Media
  - Analysis of portrayal of gender in media – Advertisements, radio, cinema
4. Programs and campaigns on gender equity
  - Case studies for national and state level programmes and campaign for gender equity
5. Media production on gender based issues
  - Developing Digital stories/ Power point presentations/ Radio Programs/Audio jingles on gender-based Issues

**Essential Readings:**

- Azad R., (2014). Gender discrimination-An Indian perspective, Atlantic Publishers and Distributors.
- Bhasin, Kamla (2000). *Understanding Gender*. New Delhi. Kaali for Women.
- Beauvoir, S. (2015). *The Second Sex*. London: Vintage Books.
- Chattopadhyay, S (2018). *Gender Socialization and the Making of Gender in the Indian Context*. New Delhi: Sage Publications.
- Ghadially, R. (2007). *Urban Women in Contemporary India*. . New Delhi: sage Publications.
- Saikia, J.P., (2017). Gender Themes and Issues, Concept Publishing Company.
- Sohoni, K Neeraja, (1994), *Status of Girls in Development Strategies*, New Delhi, Har-Anand Publications.

**Suggested Readings:**

- Dube, L. (2001) *Anthropological Explorations in Gender-Intersecting Fields*. New Delhi: Sage Publications.
- Goel, A, Kaur, A and Sultana, A (2006). *Violence against women: Issues and Perspectives*. New Delhi, Deep& Deep Publishers.
- Goel, A. (2004) *Education & Socio-Economic Perspectives of Women Development and Empowerment*. New Delhi: Deep & Deep.
- Goel, A. (2004) *Organisation & Structure of Women Development and Empowerment*. New Delhi: Deep & Deep.
- Kishwar, M. (1994) *Off the Beaten Track – Rethinking Gender Justice for Indian Women*. Mumbai: Oxford University Press.
- Krishna, S. (Ed) (2003) *Livelihood and Gender Equality in Community Resource Management*. New Delhi: Sage Publications
- UNDP, Human Development Reports (Latest publication).

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University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HH 5C2: New Media for Change**

**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		
<b>New Media for Change</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>XII Pass</b>	<b>Appeared in Communication Concepts and Theories</b>

**Learning Objectives**

- To synthesize a comprehensive view of key concepts and theories involved in new media.
- To appreciate and express the cultural significance of new media.
- To explore the myriad ways that people and organizations use new media as tools for civic engagement, activism, and political participation.
- To explore how technological changes effect social institutions and society.

**Learning Outcomes**

- Acquire knowledge of new media tools.
- Learn the concept and importance of the digital culture.
- Understand the potential and limitations of new media.
- Evaluate the role and uses of new media technology across cultures.

**SYLLABUS OF HH 5C2**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT 1: Understanding New Media: Formats concepts and Theories      10 Hours**

The Unit will give in-depth understanding of concepts and theories of new media in context of contemporary culture.

- Understanding new media; trans-media/multimedia storytelling
- Computer/mobile-mediated communication and the notion of digital
- History of New Media
- New media concepts and theories; Networked society
- Convergence culture
- Mediatization theory
- Actor-network theory

**UNIT II: Application in New Media      10 Hours**

The unit will describe the application of new media for social upliftment specifically in field of education and governance.

- Proliferation of networks

- Educational uses of new media
- Use of new media in governance
- Civic, Community, and Public Engagement
- Critique of new media as a tool of surveillance and oppression
- Social media as a liberating force
- Digital democracy and participation

### **UNIT III: New Media Laws and Ethics**

**10 Hours**

This unit will give understanding of laws pertaining to new media and analytical knowledge into related ethical issues.

- Need for Laws and Ethics in New Media
- New Media Laws and Acts
- Social Media Freedom of Expression
- Intellectual Property Rights
- Privacy, Data and International Law
- Hate Speech
- Pornography and Obscenity
- Defamation
- Government Censorship
- New Media and Democracy
- New Media and Activism

### **PRACTICAL (Credits 2; Hours 60)**

1. Case studies pertaining to ethical issues in the use of new media.
2. Evaluation of New Media campaigns.
3. Development and Designing of New Media Campaigns
4. Content Development for various new media tools.

### **Essential Readings:**

- Jenkins, Henry. (2006). *Convergence Culture: Where Old and New Media Collide*. New York, NY: NYU Press.
- *Computer-Mediated Communication: A Theoretical and Practical Introduction to Online Human Communication*, Rowman & Littlefield, April 2021.
- John C. Sherblom *Computer-Mediated Communication: Approaches and Perspectives*, 6 March 2019
- Aaron Langille and Victoria Kannen *Virtual Identities and Digital Culture* Taylor & Francis Ltd, 2021.
- Jeremy Harris Lipschultz, *Social Media Law and Ethics*, Routledge, 2021.

### **Suggested Readings:**

- Mike Z Yao, Rich Ling, “What Is Computer-Mediated Communication?”—An Introduction to the Special Issue, *Journal of Computer-Mediated Communication*, Volume 25, Issue 1, January 2020, Pages 4–8, <https://doi.org/10.1093/jcmc/zmz027>.
- Pannu Parveen, Tomar A Yuki, *Communication Technology for Development*, IK International publication, 2012.

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University of Delhi, from time to time.**



**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HH 5D1: Fabric Production**

**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		
Fabric Production	4	2	0	2	XII Pass	Appeared in Textile Science

**Learning Objectives**

- To provide students with knowledge of various production techniques.
- To learn about the various standard test methods required for the evaluation of various types of fabrics

**Learning Outcomes**

- Demonstrate an understanding of various types of fabric forming methods.
- Familiarize students with the types and scope of technical textiles.
- Acquire skills to inspect, manage and control quality in the textile industry.

**SYLLABUS OF DSE HH 5D1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Weaving**

**10 Hours**

- Structure and components of woven fabric: warp, weft, selvedge, grain
- Yarn preparation for weaving
- Weaving operations
- Types of Loom: shuttle and shuttleless looms
- Types of weaves: Basic and Decorative
- Blended Fabrics

**UNIT II: Knitting**

**8 Hours**

- Structure and components of knitted fabric: courses, wales
- Yarn preparation for knitting
- Knitting needles
- Knitting process and machines
- Knit fabric stitches
- Knitted fabric classification: Warp and Weft knits
- Techniques for knitwear production- fully-cut, fully-fashioned and integral

**UNIT III: Non-Wovens** **6 Hours**

- Production of non-woven
- Types of non-woven fabrics and their properties
- Application in various sectors- apparel and industrial

**UNIT IV: Other methods of fabric construction** **4 Hours**

- Nets
- Laces
- Braiding
- Knotting

**UNIT V: Technical Textiles** **2 Hours**

**PRACTICAL**  
**(Credits 2; Hours 60)**

1. Yarn Count : Direct and Indirect	6
2. Dimensional Stability of cotton and wool and knitted fabric	8
3. Identification of weaves, point paper diagrams	12
4. GSM	4
5. Drape	6
6. Crease recovery	6
7. Bending length	6
8. Tear strength	6
9. Fabric analysis	6

**Essential Readings:**

- Joseph, M.L., (1988) Essentials of Textiles (6th Edition), Holt, Rinehart and Winston Inc., Florida.
- Rastogi, D. (Ed.) and Chopra, S. (Ed.), (2017), Textile Science, Orient Black Swan.
- Sekhri S., (2011) Textbook of Fabric Science: Fundamentals to Finishing, PHI Learning, Delhi.
- Chattopadhyay, K.D., 1995, Handicrafts of India, Wiley Eastern Limited, N Delhi.
- Corbman P. B., (1989), Textiles- Fibre to Fabric, 6th edition, Mc Graw Hill, New York.
- Pizzuto's J.J. "Fabric Science", Fairchild Publication, New York.
- Hollen N., Saddler J., Langford A.L., Kadolph S.J., (1988), Textiles, 6<sup>th</sup> Edition, Macmillan Publishing Company New York, USA
- Das, Shukla, 1992, Fabric Art- Heritage of India, Abhinav Publications, N Delhi.
- Chelna Desai, 1988, Ikats Textiles of India, Chronicle Books, India

**Suggested Readings:**

- Brackenbury, T. (2005). *Knitting Clothing Technology*, Blackwell Science Publishers
- Horrock A.R. and Anand, S.C. (2000). *Handbook of Technical Textiles*, Cambridge: Woodhead Publishing.
- Spencer, D.J. (2005) *Knitting Technology: A Comprehensive Handbook and Practical Guide*, 4th ed. Cambridge: Woodhead Publishing.
- Booth, J. E. (1964) Principle of textile testing an introduction to physical methods of testing textile fibers, yarns, and fabrics. 2nd Edition. London: Meanness Butterworths.
- Saville, P. B. (1999) Physical testing of textiles. Cambridg: Woodhead Publishing Limited.
- Skinkle, J.H. (1940) Textile Testing. New York: Chemical Publishing Co. Inc. Brooklyn.

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**University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HH 5D2: Understanding Fabrics**

**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		
Understanding Fabrics	4	2	0	2	XII Pass	Appeared in Textile Science

**Learning Objectives**

- To briefly study the fabric components.
- To enhance awareness of various commercially available fabrics.
- To understand the properties and end uses of the various types of fabrics.

**Learning Outcomes**

The students would be able to:

- Understand the components of a textile fabric.
- Identify the various commercially available fabrics.
- Appropriately select fabrics based on their properties, cost and recommended end use.

**SYLLABUS OF HH 5D2**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Fabric components**

**7 Hours**

In this unit, students will be able to understand the basics of fibres, yarns and fabric.

- Fibres and yarns
- Methods of fabric construction
- Fabric finishing- dyeing, printing, aesthetic and functional finishes

**UNIT II: Commercially important woven fabrics: Identification, properties and end use** **14 Hours**

In this unit, students will gain an understanding of various types of woven fabrics

- **Cotton and other Cellulosic Fabrics**
  - Light weight fabrics- Mulmul, Voile, Organdy, etc.
  - Medium weight fabrics- Cambric, Poplin, Cotton Rubia, Denim, Chambray, Seer-sucker, Eyelash dobby, Schiffli, Jute, Linen, etc.
  - Heavy weight fabrics- Canvas, Casement, Gabardine, Damask, Corduroy, Velvet, Terry, etc.

- **Silk and Wool fabrics**
  - Lightweight fabrics- Silk Crepe, De'chine, Georgette, Chiffon, Organza, etc.
  - Medium/Heavy weight fabrics- Flat silk, Satin, Taffeta, Dupion, Shantung, Raw silk, Tussar silk, Habutai silk, Tweed, Wool twill
- **Man-made fibre and blended fabrics**
  - Art silk, Lizzy-Bizzy, Terryvoile, Semi-crepe, Moss crepe, Artificial chiffon, Artificial

**UNIT III: Commercially Important Knitted and Non-woven fabrics:**  
**Identification,**  
**properties and end use**

**4 Hours**

In this unit, students will learn about various types of knitted and non-woven and other types of fabrics

- Knitted Fabrics- Knitted Terry, Jersey, Rib Knit, Interlock knit, Pique, Velour, Scuba, Fleece, etc.
- Non-wovens- Different types and weights
- Others- Leatherette, Suede, Nets and Laces

**UNIT IV: Traditional Indian Fabrics: Identification, properties and end use** **5 Hours**

In this unit, students will be learn to identify various types of traditional Indian fabrics

- Selected woven, embroidered, painted, printed and dyed traditional Indian textiles.

**PRACTICAL**  
**(Credit 2; Periods: 60)**

7. Identification of various types of fibres, yarns, fabric types (woven, knitted, non-wovens and others), weaves, thread count and fabric weight
8. Collection of swatches for portfolio preparation of woven, knitted, non-woven and traditional Indian fabrics

**Essential Readings**

- Corbman P. B., (1989), Textiles- Fibre to Fabric, 6th edition, Mc Graw Hill, New York.
- Hollen N., Saddler J., Langford A.L., Kadolph S.J., (1988), Textiles, 6<sup>th</sup> Edition, Macmillan Publishing Company New York, USA
- Joseph, M.L., (1988) Essentials of Textiles (6th Edition), Holt, Rinehart and Winston Inc., Florida.
- Rastogi, D. (Ed.) and Chopra, S. (Ed.), (2017), Textile Science, Orient Black Swan.
- Sekhri S., (2011) Textbook of Fabric Science: Fundamentals to Finishing, PHI Learning, Delhi.

**Suggested Readings**

- Pizzuto's J.J. "Fabric Science", Fairchild Publication, New York.
- Tholia A., (2013) Understanding Fabrics- A practical Approach, 2nd edition, Sarv International.
- Das, Shukla, 1992, Fabric Art- Heritage of India, Abhinav Publications, N

Delhi.

- Chelna Desai, 1988, Ikats Textiles of India, Chronicle Books, India.

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HH 5E1: Entrepreneurship Development and Enterprise Management**

**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		
Entrepreneurship Development and Enterprise Management	4	2	0	2	XII Pass	Appeared in Fundamentals of Resource Management

**Learning Objectives**

- To familiarize the students with meaning and concept of entrepreneurship and its ecosystem
- To sensitize and orient students towards identifying entrepreneurial opportunities and market potential
- To impart knowledge for setting up an enterprise and its management

**Learning Outcomes**

The students would be able to:

- Understand the concepts of an entrepreneur, entrepreneurship and entrepreneurial ecosystem in context of India.
- Appreciate the role of entrepreneurial motivation and creativity in innovation.
- Develop skills in project identification, formulation and appraisal.
- Gain insight into setting up of an enterprise and its management.

**SYLLABUS OF HH 5E1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Entrepreneurship Development**

**10 Hours**

Fundamental concepts of entrepreneurship development and entrepreneurial ecosystem.

- Entrepreneurship- concept, significance, stages, growth process, entrepreneurship development in India, entrepreneurship education model, drivers & barriers
- Entrepreneur- characteristics, competencies, types, style & motivation
- Women Entrepreneurship in India- characteristics, competencies, significance, status, factors promoting , challenges faced, strategies for women entrepreneurship development- income generation , self-help groups, micro enterprises and self- employment, skill development and technology transfer

- Entrepreneurial Ecosystem: Domains (accessible markets, availability of finance, conducive culture, human capital, progressive policy framework, and a range of institutional support)
- Creativity: Concept, significance & process
- Innovation: Concept, types, process, sustaining growth- disruptive innovation.

## **UNIT II: Enterprise Planning and Launching**

**10 Hours**

Project identification, project formulation, project appraisal

- Types of enterprises: classification based on sector, capital, gender, place, product, ownership pattern, platform & process
- Project Identification: sensing business opportunities, feasibility study
- Project Formulation: Project report & its components, writing a business proposal
- Project Appraisal: Technical, marketing, financial, legal and environmental

## **UNIT III: Enterprise Management & Sustenance (with reference to start ups and micro enterprises)**

**10 Hours**

- Production Management - Organizing production; input-output cycle - ensuring quality
- Marketing Management- Understanding markets and marketing: types, functions & marketing mix
- Financial Management - Concept, types and sources of finance, financial ratios & projections
- Human resource management – Concept, significance, practices, challenges
- Total Quality Management
- Business ethics

### **PRACTICAL (Credits 2; Hours 60)**

1. Micro Lab
2. SWOC analysis of successful entrepreneurs and enterprises through case profiling.
3. Entrepreneurial Competencies & Motivation - Simulations & experiential learning.
4. Institutions facilitating entrepreneurship development in India.
5. Preparation and appraisal of a business plan.
6. Calculations of financial Indices.
7. Design and development of marketing mix for a startup.
8. Designing of sales campaign for digital marketing

### **Essential Readings:**

- Barringer R. B. (2020). *Entrepreneurship: Successfully Launching New Ventures* (6e ed.). Pearson Education.
- Chhabra T. N. (2015). *Entrepreneurship Development*. New Delhi: Sun India.
- Charantimath, P. M. (2018). *Entrepreneurship Development and Small Business Enterprises*. Pearson Publications.
- Desai V. (2011). *The Dynamics of Entrepreneurial Development and Management*. Himalaya Publishing House.

### **Suggested Readings:**

- Gundry L, K. & Kickul J. R. (2007). *Entrepreneurship Strategy: Changing Patterns in New Venture Creation, Growth, and Reinvention*. SAGE Publications, Inc.
- Taneja & Gupta. (2001). *Entrepreneur Development- New Venture Creation*. New Delhi: Galgotia Publishing Company.



- Zaware, N. (2019). Entrepreneurship Development and Startups Managemen. Educreation Publishing.

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HH 5E2: Design Thinking and Innovation**

**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		
Design Thinking and Innovation	4	2	0	2	XII Pass	Appeared in Fundamentals of Resource Management

**Learning Objectives**

- To comprehend the Design Thinking concept for fostering innovation
- To understand concept and role of innovation in present day context
- To apply design thinking solutions individually and in team for maximizing business growth
- To instill a culture of design thinking to enhance innovation within an organization

**Learning Outcomes**

The students would be able to:

- Overcome cognitive fixedness and develop new mindset that integrates design thinking for innovation.
- Empathize and apply human centered design for seeking innovative solutions.
- Create the optimal environment and team dynamics to steer innovation and collaboration.
- Develop the capacity to design and test cutting-edge for customer-focused prototypes

**SYLLABUS OF HH 5E1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Innovation**

**10 Hours**

This unit will help students to understand the concept of innovation and types and its dimensions

- Innovation: Concept, significance, types and process
- Innovation diffusion theory
- Innovation in organizations: Drivers and barriers, bottom up and top down approach, horizontal versus vertical approach
- Dimensions of innovation: Innovation eco-system in India, social Innovation, grassroots innovation, frugal innovation and global Innovation-global innovation index framework (GII)

**UNIT II: Design thinking approaches and processes**

**12 Hours**

The focus of this unit would be on developing the basic concepts of design thinking, business use of design thinking, mindset, approaches and processes.

- Design thinking : Concept, discipline, role and mindset
- Design Thinking Approaches: Empathy, Ethnography, Divergent thinking, convergent thinking, Visual thinking, Assumption testing, Prototyping and Time for learning and validation
- Design thinking resources: people, place, materials and organizational fit
- Design thinking processes: Double diamond process, Stanford d. school 5 stage process

### **UNIT III: Design thinking in practice**

**8 Hours**

This unit will help students to gain insights about design thinking tools, methods and its application.

- Stages of designing for growth
- Design thinking tools and methods: visualization, journey mapping, value chain analysis, mind mapping, brain storming, concept development, assumption testing, customer co creation, rapid prototyping, launching
- Design thinking applications in organizations

### **PRACTICAL (Credits 2; Hours 60)**

1. The foundation for innovation: Define users' needs and problems, identify and reframe the most game changing part of the problem and analyze the contextual environment for viable solution.
2. Ideate: Develop user focus ideas to identify new problems, and apply tools for innovative solutions, ideation through design thinking approaches and refine innovative ideas.
3. Develop an experimentation mindset: Combine ideas into complex innovation concepts, critique and strengthen concepts, guide prototyping by creating critical questions related to concept's desirability, feasibility and viability.
4. Implement: Assess developer and user perspectives for bias that may affect implementation, apply framework to strengthen communications about an innovation's value and reflect on management skills for sustaining a culture of innovation

#### **Essential Readings:**

- Soni, Pwan. (2020). Design your thinking: The Mindsets, toolsets and skillsets for creative problem solving
- Kahneman, Daniel. (2011). Thinking fast and slow
- Drucker, P. F. (2006). Innovation and entrepreneurship: Practice and principles. USA: Elsevier.70
- Roy, R. (2008) Entrepreneurship. New Delhi: Oxford University Press

#### **Suggested Readings:**

- Chesbrough, H. (2006). Open business model: How to thrive in the new innovation landscape. Harvard Business School Press.
- CS Prasad (2012), Small and Medium Enterprises in Global Perspective, New Century Publications, New Delhi

- Fagerberg, J., Mowery, D. C., & Nelson, R. R. (Ed.). (2006). The Oxford Handbook of Innovation. New Delhi: Oxford University Press.
- Kaplan, J. M. (.2006). Patterns of entrepreneurship. John Wiley & Son.

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**DEPARTMENT OF HOME SCIENCE**  
**SEMESTER – VI**

**B.Sc. (Honours) Home Science**

**DISCIPLINE SPECIFIC CORE COURSE**  
**DSC HH 616: Traditional Indian Textiles**

**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		
Traditional Indian Textiles	4	3	0	1	XII Pass	Appeared in Textile Science

**Learning Objectives**

- To create awareness and foster appreciation of the country's rich textile heritage
- To impart knowledge of fundamentals of textile conservation and storage
- To acquaint students about the khadi, handloom and handicrafts sectors and measures taken by various organisations for their sustenance

**Learning Outcomes**

- Recognise and identify embroidered fabrics of different states in terms of stitches and designs
- Explain material and design of selected traditional woven fabrics.
- Describe our heritage of varied dyed, painted and printed fabrics.
- Classify conservation techniques and recognise signs of deterioration of textiles.
- Carry out care and conservation of traditional textiles.
- Provide an insight into the evolution and socio-economic significance of *khadi*, handloom and handicraft sectors.
- Discuss sustenance of traditional textile crafts and interventions by organisations.
- Analyse the textile arts in their historical perspective, the impact of modernisation and their contemporary status.

## SYLLABUS OF DSC HH 616

### THEORY (Credits 3; Hours 45)

#### UNIT I: Study of Textile Crafts of India: with reference to history, production centers, designs, materials, colours and products. **30 Hours**

- Woven Textiles - Banaras Brocades, Jamdanis and Baluchars of Bengal, Kani Shawls of Kashmir, Kanjivarams of Tamil Nadu
- Embroidered Textiles-Kanthas of Bengal, Kasuti of Karnataka, Phulkari of Punjab, Chikankari of Uttar Pradesh, Kashida of Kashmir, Gujarat embroideries
- Painted and Printed textiles –Kalamkaris of Andhra Pradesh, Dabu printing of Rajasthan, Ajrakh printing of Gujarat
- Dyed textiles –Bandhnis of Rajasthan and Gujarat, Ikats- Patola of Gujarat, Bandhas of Orissa, Telia Rumal of Andhra Pradesh

#### UNIT II: Status of Traditional Textiles in Modern India **7 Hours**

- Evolution and socio-economic significance of Khadi, Handloom and Handicraft sector
- Sustenance of traditional textile crafts
- Interventions by organizations

#### UNIT III: Conservation of Traditional Textiles **8 Hours**

- Types of Conservation – Preventive and Curative
- Factors influencing degradation of textiles
- Care and storage techniques

### PRACTICAL (Credits 1; Hours 30)

1.	Resist Dyeing Techniques	10
	<ul style="list-style-type: none"><li>• Tie &amp; dye using various techniques on cellulosic and protein fibers</li><li>• Batik on cotton</li></ul>	
2.	Printing	4
	<ul style="list-style-type: none"><li>• Block printing: pigment</li><li>• Screen printing: pigment</li></ul>	
3.	Embroidery stitches of traditional embroideries	6
4.	Portfolio development-Traditional textile crafts	4
5.	Product development	4
6.	Visit to craft centers/museums: Craft documentation report on any one craft	2

#### Essential Readings:

- Agarwal, O.P., 1977, *Care and Presentation of Museum projects* – II, NRL
- Barnard, N., Gillow, J., 1993, *Indian Textiles*, Thames and Hudson, USA
- Chattopadhyaya, K.D., 1995, *Handicrafts of India*, Wiley Eastern Limited, N Delhi
- Crill, R., 2015, *The Fabric of India*, Victoria and Albert Museum, UK
- Das, Shukla, 1992, *Fabric Art- Heritage of India*, Abhinav Publications, N Delhi.
- Grundy & Northedge, (1998) *Standards in the Museum Care of Costume and Textile*

*Collections*, Museums & Galleries Collection, Spin Offset Limited, Chapter 7-14, pg 35-54

- Mausumi Kar, (2015), *The Indian Textile and Clothing Industry An Economic Analysis*, Springer New Delhi Heidelberg New York Dordrecht London, Chapter 1& 2, pg 12-33.
- Pandit Savitri, 1951, *Indian Embroidery- Its Variegated Charm*, Pandit Publisher, Baroda  
Embroidery tutorials, video links of woven textiles and slide share

**Suggested Readings:**

- Annual Report, (2002-2003), Handloom Industry, Ministry of textiles, Chapter 5, pg 1-20
- Chelna Desai, 1988, *Ikats Textiles of india*, Chronicle Books, India
- Craft Documentaries on Youtube
- Evaluation study on khadi and village industries programme, (2001) Programme evaluation organization planning commission government of India, New Delhi. Chapter 1 & 2, pg 1-9
- Karolia, Anjali, 2019, *Traditional Indian Handcrafted Textiles*, Niyogi Publishers

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**DISCIPLINE SPECIFIC CORE COURSE**  
**DSC HH 617: Space Design and Sustainability**

**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		
Space Design and Sustainability	4	3	0	1	XII Pass	Appeared in Personal Finance and Consumer Studies

**Learning Objectives**

- To understand the fundamentals of space planning.
- To acquire knowledge regarding materials, building construction techniques and technologies.
- To comprehend sustainable parameters in space design.

**Learning Outcomes**

- Comprehend the concept of design applicable to interior spaces.
- Understand the application of materials and finishes to create aesthetic and sustainable interiors.
- Comprehend the concept of sustainability and green rating systems.

**SYLLABUS OF DSC HH 617**

**THEORY**  
**(Credits 3; Hours 45)**

**UNIT I: Basic Concepts in Space Planning**

**10 Hours**

This unit will develop understanding regarding the concept of space planning and designing.

- Concept of space as a resource, characteristics of space
- Principles of planning spaces
- Zoning
- Types of houses: Independent houses and Apartments.
- Contemporary Housing - Service Apartments, Senior living.
- Building bye-laws – NBC and MPD

**UNIT II: Construction Features in Building Design**

**15 Hours**



This unit will acquaint students with various elements of building construction important for developing a strong structure.

- Site selection
- Conventional and Non-conventional building materials, sustainable building materials
- Structural components of a building (Material and Types) – Foundation, Walls, Flooring, Roofs, Doors and Windows, Staircase.
- Basic building services
- Landscaping
- Earthquake resistant structures
- Home Automation

### **UNIT III - Concept of Space Design**

**15 Hours**

This unit will introduce students to the area of space design such as elements and principles of design, furniture and furnishings and wall treatment.

- Introduction to Elements and Principles of design
- Concept of Colour in Interior Design - Colour Theories, Colour Psychology, Colour Schemes, Colour Forecasting
- Energy Efficient Lighting Systems
- Furniture - Types, Selection criteria, Arrangement
- Furnishings - Home Furnishing, Window treatment, Floor Coverings
- Wall treatment
- Use of sustainable material in space design

### **UNIT IV: Sustainable built environment**

**5 Hours**

This unit will introduce students to the concept and application of sustainability in built environment.

- Introduction to sustainable built environment
- Green building rating guidelines in India – GRIHA and LEED
- Concept of Smart Cities

### **PRACTICAL (Credits 1; Hours 30)**

1. Introduction to building terminologies, Concept of Scale, building constructions symbols
2. Evaluation of floor plans on the basis of principles of space planning
3. Preparation of floor plans
  - Multipurpose rooms/ studio apartment (Computer aided / manual)
4. Identification and characteristics of different building materials
5. Case study of a Green Building
6. Project on Landscaping / Home Automation

**Essential Readings:**

- Goel S., Seetharaman P. Kakkar, A. (2015). *Manual on Interior space designing*, Elite publishers.
- Goldstein, H. & Goldstein, V. (1988). *Art in Everyday Life (4th ed.)*, Oxford & IBH Publishing Co.
- Indian Green Building Council. (2022). *Introduction to Green Buildings and Built Environment*, BSP Books.
- Kumar, S. (2008). *Building Construction*, Standard Publisher.
- Rao, M.P. (2020). *Interior Design Principles and Practices*, Standard Publishers Distribution.

**Suggested Readings:**

- Duggal S.K. (2017). *Building Materials*. CRC Press.
- Green Rating for Integrated Habitat Assessment (GRIHA). (2021). *GRIHA Manuals*, GRIHA Council.
- Grimley, C. and Love, M. (2018). *The Interior Design Reference & Specification Book*, Rockport Publishers.
- Indian Green Building Council. (2021). *IGBC Manuals*, IGBC.
- Iyer, G. H. (2022). *Green Building Fundamentals*, Notion Press.
- Mitton, M. and Nystuen, C. (2021). *Residential Interior Design: A Guide to Planning Spaces (4th ed.)*, Wiley.
- Singh, G. (2019). *Building Construction and Materials*, Standard Publishers.

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**DISCIPLINE SPECIFIC CORE COURSE**  
**DSC HH 618: Extension for Development**

**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		
Extension for Development	4	3	0	1	XII Pass	Appeared in Communication Systems and Social Change

**Learning Objectives**

- To enable the students to grasp the concept of extension and its role in development.
- To gain knowledge and application of principles and processes involved in Extension Programme Planning and Management including community mobilization and stakeholder participation.
- To understand the principles and process of Extension Programme Design and Management.
- To develop understanding and skills in planning participatory approaches in Extension Programme Management.
- To inculcate a thorough understanding of the dynamic nature of extension programmes based on the changing needs of society as well as critical appraisal of the presently operating extension programs in the country.

**Learning Outcomes**

- Learn about the concept and scope of extension in national development.
- Develop an understanding of the principles and process involved in programme design and management.
- Develop skills for using participatory approaches in programme management.
- Gain knowledge for various development schemes and programmes operating at the national level.

## **SYLLABUS OF DSC HH 618**

### **THEORY (Credits 3; Hours 45)**

#### **UNIT I: Extension: Concept and Principles**

**9 Hours**

This unit explains the concept of extension and lays thrust on the fundamental concepts of extension applied in national development.

- Extension: concept, goals, philosophy, history and scope
- Types of extension and approaches to Extension
- Principles of Andragogy; Andragogy vs. Pedagogy
- Principles of extension
- Relationship between communication and extension - role of extension in development
- Methods of community contact in Extension

#### **UNIT II: Participation & Leadership for Community Development**

**12 Hours**

This unit highlights the concept of participation required as a prerequisite in any extension programme and develop skill sin the same.

- Stakeholders in Extension programs
- People's participation and social mobilization in development, levels of participation
- Participatory Learning and Action – concept, principles, classification of tools and techniques
- Leaders in extension – functions, types and leadership styles and theories
- Diffusion of innovation and adoption – concept, theory and application

#### **UNIT III: Programme Management**

**12 Hours**

This unit emphasizes on the principles and process involved in designing a programme and its management. The unit also strives to give conceptual clarity on project cycle and the different models of extension programme management.

- Project cycle- goals, objectives, indicators, outputs and outcomes
- Concept and Principles of extension program management
- Models of extension programme management - overview of models, Sandhu's model, Logic model
- Monitoring and evaluation

#### **UNIT IV: Development Programmes**

**12 Hours**

This unit elucidates on the in-depth understanding of the various Extension schemes and programmes initiated by the Government.

- Development issues and goals- national and international perspectives, Sustainable Development Goals
- Contemporary National Development Programmes (related to education, employment, income, health and nutrition, digitalization and women) – objectives, target groups, salient features, monitoring and evaluation, outcomes, stakeholders, partnership and funding

**PRACTICAL**  
**(Credits 1; Hours 30)**

1. Approaches to Adult Education
2. Develop skills in planning and using individual and small group methods in extension
3. Understanding the use of PLA as need assessment tools
4. Assessing the leadership skills in a case-study format

**Essential Readings:**

- Beck, S., 2020, Communication in the 2020s. Routledge.
- Kumar, S., 2002, Methods for community participation: a complete guide for practitioners. Vistaar Publications, New Delhi.
- Ray G.L., 2015, Extension, Communication and Management, Kalyani Publications, New Delhi.
- Sandhu, A S., 2018, Extension Programme Planning. Oxford and IBH Publishers, New Delhi.
- Singh, S., 2022, A Brief Book on Extension Education. New Vishal Publications, New Delhi.
- Singh, A K., 2020, Frontline Extension in India Innovations and Reforms. Biotech Publisher, New Delhi.
- Supe, S V., 2019, An Introduction to Extension Education. Oxford & Ibh Publishing Co. Pvt Ltd, New Delhi.

**Suggested Readings:**

- Bhatnagar. O.P & Dahama, O.P., 2009, Education and Communication for Development 2ed. Oxford & IBH Publishing Co. Pvt Ltd, New Delhi.
- Dale R., 2004, Evaluating Development Programmes and Projects. Sage Publications, New Delhi.
- Kumar & Hansra, 2000, Extension Education for Human Resource Development. Concept Publishing Company, New Delhi.
- Mikkelsen, B., 2002, Methods for Development Work and Research. Sage Publications, New Delhi.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC ELECTIVE**  
**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/ 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 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; 30 Hours)**

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* 4<sup>th</sup> 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* 1<sup>st</sup> Ed. New Age International Pvt Ltd, New Delhi.
- Kumar, R. (2019) *Research Methodology: A Step-by-Step Guide for Beginners*. 5<sup>th</sup> 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](https://www.ugc.ac.in/e-book/Academic%20and%20Research%20Book_WEB.pdf)

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**



**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HS 6-2: Innovation and Entrepreneurship**

**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		
<b>Innovation and Entrepreneurship</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>XII Pass</b>	<b>NIL</b>

**Learning Objectives**

- To motivate students to opt for innovation and entrepreneurship as a career option.
- To foster entrepreneurial traits and competencies
- To make students understand the critical role of creativity, design thinking and innovation in entrepreneurship development
- To prepare students to plan, launch and manage start-ups/enterprise
- To establish an ecosystem for students that is conducive to networking and incubating

**Learning outcomes**

After completing the course, students will be able to:

- Consider opting innovation and entrepreneurship as a career.
- Develop entrepreneurial traits and competencies.
- Ideate a viable business proposition.
- Network for venturing and innovating.
- Pitch a business proposal.

**SYLLABUS OF DSE 6-2**

**THEORY**  
**(Credit 1: Hours: 15)**

**UNIT I: Innovation**

**5 Hours**

- This unit focuses on developing the fundamental concept of innovation and its dimensions.
- Innovation: Concept, significance, types and process
- Innovation diffusion theory

- Innovation in organizations: Drivers and barriers, bottom-up and top-down approach, horizontal versus vertical approach
- Dimensions of innovation: Innovation eco-system in India, social Innovation, grassroots innovation, frugal innovation, and global Innovation-global innovation index framework (GII)

## **UNIT II: Creativity & Design thinking**

**4 Hours**

- The focus of this unit will be on developing the basic concepts and role of creativity & design thinking in innovation.
- Creativity- Concept, significance, role, processes and fostering creativity for innovation
- Design thinking: Concept, discipline, role, mindset, resources, and processes
- Design Thinking Approaches: Empathy, Ethnography, Divergent thinking, convergent thinking, Visual thinking, Assumption testing, Prototyping and Time for learning and validation

## **UNIT III: Entrepreneurship and Enterprise Management**

**6 hours**

This unit will orient the students to the concept of entrepreneurship and enterprise management.

- Entrepreneurship - Concept, stages, growth process, and entrepreneurship development in India, Government policies and schemes
- Entrepreneur- characteristics, competencies, types, styles, and motivation
- Enterprise & its management- types and strategies for Start-up launching, management and sustenance
- Exit strategies for a new startup- trends in India
- Networking & business ethics

## **PRACTICAL (Credit 3: Hours: 90)**

### **1. Entrepreneurial Motivation: Developing an appreciation for entrepreneurial traits and entrepreneurship as a career through**

**14 Hours**

- Entrepreneurial motivation orientation – Sector-specific case studies of successful entrepreneurs and profiling of required traits for innovation
- Understanding self as a prospective entrepreneur - Who am I?, Locus of control, Competency Profiling, SWOC analysis, Mapping entrepreneurial styles

### **2. Understanding and appreciating Innovations and design thinking:**

**20 Hours**

- Identification of innovations in day-to-day life
- Critical evaluation of innovations and design-driven solutions – case studies
- Environment scanning for business opportunities
- User's empathy mapping – understanding user's pain, pain creators and relievers
- Redesign activities for possible solutions - products and services
- Industry-integrated learning – live projects

### **3. Market research & mapping start-up station:**

**12 Hours**

- Environment scanning for business opportunities

- Ideation: Generation, articulation, testing and incubating
- Develop a feasibility report

#### **4. Business plan and appraisal:**

**10 Hours**

- Business preparation
- Appraisal of business plan
- Risk auditing and mitigation

#### **5. Operations and Marketing management:**

**12 Hours**

- Develop operational management sheet and applications for registrations and licenses
- Familiarizing with the relevant documents, including the inventory and stock registers.
- Customer segmentation and profiling
- Prepare the 4Ps of the marketing mix, including digital marketing tools
- Prepare an elevator pitch

#### **6. Financial management:**

**12 Hours**

- Analysis of financial requirements and available capital
- Sources of finance - bootstrapping, crowdfunding, angel investing venture capital
- Financial statements, cash flow management, applicable interest rates of different types of loans
- Calculation of financial ratios, break-even analysis and applicable taxes
- Designing funding strategy and start-up valuation

#### **7. Human resource management and legal framework:**

**10 Hours**

- Functional requirements and cost implications
- Team formation
- Ensuring health and safety at the workplace
- Business communication
- Enterprise registration- Legal compliances, paperwork and cost
- Intellectual property rights

#### **Essential Readings:**

- Bhatt Arvind Kumar (2022). Innovation and Entrepreneurship. Atlantic publisher
- Chabbra T. N. (2019). Entrepreneurship Development. New Delhi: Sun India.
- Charantimath, P. M. (2018). Entrepreneurship Development and Small Business Enterprises. Pearson Publications.
- Carayanis Elias G, Samara Elpida T & Bakouros Yannis L.(2015). Innovation and Entrepreneurship. Springer.
- Drucker. Peter F. (2006), Innovation and Entrepreneurship. Harper Business
- Gundry L, K. & Kickul J. R. (2007). Entrepreneurship Strategy: Changing Patterns in New Venture Creation, Growth, and Reinvention. SAGE Publications, Inc.
- Santiago, Sam (2011), The official book of Innovation. Rising above LLC publisher
- Soni, Pwan.(2020). Design your thinking: The Mindsets, toolsets and skillsets for creative problem solving

#### **Suggested Readings:**

- Christensen M Clayton (2013). The innovator's dilemma. Harvard Business Review Press.
- Daum Callie (2020). Business strategy: essentials you always want. Vibrant publishers

- Goyal P. (2017). Before you start up: How to prepare to make your start-up a dream reality. Fingerprint publishing.
- HBR's 10 Must Reads on Startups and Entrepreneurship (2018). Featuring Bonus Article "Why the Lean Startup Changes Everything" by Steve Blank
- Nath,D. Mitra, S. (2020) Funding your startup and other nightmare. Penguin portfolio.
- Taneja & Gupta. (2001). Entrepreneur Development- New Venture Creation. New Delhi: Galgotia Publishing Company.

**Web references:**

- <https://web.iima.ac.in/assets/upload/mdp/480284395YEP%20Brochure.pdf>
- <https://www.iimb.ac.in/entrepreneurship>
- <https://www.mepsc.in/skill-based-programs/>
- <https://ediindia.ac.in/pgdm-innovation-entrepreneurship-venture-development/>

**Training material:**

- EMT kit developed by NIESBUD, New Delhi and EDII Ahmedabad

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**Department of Home Science**  
**Semester – IV**

**B.Sc. (Prog.) Home Science**

**DISCIPLINE SPECIFIC CORE COURSE**

**DSC HP 410: Lifespan Development II: Middle Childhood and Adolescence**

**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		
Lifespan Development II: Middle Childhood and Adolescence	4	3	0	1	XII Pass	Appeared in Lifespan Development I: Prenatal and Early Years

**Learning Objectives**

- To acquire a detailed understanding of development in middle childhood and adolescence.
- To gain insights into context specific cultural practices of development in children and adolescents.
- To develop understanding of the various roles and relationships during middle childhood and adolescence.

**Learning Outcomes**

Students will be able to:

- To develop an understanding of developmental milestones and domains from middle childhood to adolescence.
- To gain insights into the cultural aspects of development.
- To understand how relationships evolve and are maintained during middle childhood and adolescence.

## **SYLLABUS OF DSC HP 410**

### **THEORY (Credits 3; Hours 45)**

#### **UNIT I: Introduction to Middle Childhood Years 11 Hours**

This unit will explain the stage of middle childhood and the various changes in physical-motor, cognitive and language domains.

- Physical-motor Development
- Cognitive Development
- Language Development

#### **UNIT II: Development in Middle Childhood Years 11 Hours**

This unit will explain the stage of middle adulthood and focus on the social emotional changes specific to this stage.

- Social- Role of Peers, School and Family
- Emotional Development
- Moral Development

#### **UNIT III: Introduction to Adolescence 11 Hours**

This unit will focus on adolescence in India and focus on selected domains of development.

- Adolescence in the cultural context
- Physical and physiological changes during adolescence
- Cognition and Language Development

#### **UNIT IV: Development in Adolescence 12 Hours**

This unit will explain the stage of adolescence and focus on the socio-emotional changes specific to this stage.

- Formation of Identity during Adolescence
- Social and Emotional Development
- Moral Development

### **PRACTICAL (Credit 1; Hours 30)**

1. Methods of studying Children and Adolescents
  - Questionnaire
  - Sociometry
  - Case study
2. To write a narrative account on adolescent years to understand the development of self.
3. To develop activities to facilitate cognition and creativity in adolescents.
4. Use of secondary sources to understand the depiction of children and adolescents in media
5. Psychometric tests for children and adolescents.

**Essential Readings:**

- Berk, L. E. (2007). Development through the lifespan. Delhi: Pearson Education. McGraw-Hill.
- Papalia, D.E. and Martorell, G. (2015). Experience Human Development, McGraw-Hill Education.
- Rice, F. P. (1998). Human Development: A lifespan approach. New Jersey: Prentice Hall.
- Santrock, J. W. (2007). A topical approach to life-span development. New Delhi: Tata
- Singh, A. (Ed). 2015. Foundations of Human Development: A life span approach. New Delhi: Orient Black Swan.
- Sharma, N. (1999). Understanding Adolescence. National Book Trust.
- Ranganathan, N. (Ed.). 2020. Understanding Childhood and Adolescence. New Delhi: Sage.

**Suggested Readings**

- Journal of Developmental Psychology
- Rutter, M. and Rutter, M. (1992). Developing Minds. Challenge and continuity across the lifespan. London: Penguin.

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**DISCIPLINE SPECIFIC CORE COURSE**  
**DSC HP 411: Lifespan Approach to 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		
Lifespan Approach to Nutrition	4	3	0	1	XII Pass	Appeared in Foundation of Food Science and Nutrition

**Learning Objectives**

- To acquire knowledge about the nutritional needs and concerns of an individual throughout the life cycle.
- To enable students in understanding the principles of planning nutritionally adequate diets.
- To make them exercise food choices consonant with good health based on sound knowledge of principles of nutrition.

**Learning Outcomes**

- Acquire knowledge about the nutritional needs and concerns of an individual throughout the life cycle.
- Comprehend the principles of planning nutritionally adequate diets.
- Exercise food choices consonant with good health based on sound knowledge of principles of nutrition.

**SYLLABUS OF DSC HP 411**

**THEORY**  
**(Credits 3; Hours 45)**

**UNIT I: Basics of Nutrient Requirements and Meal Planning**

**12 Hours**

In this unit concepts of food groups and food exchange lists for meal planning, factors affecting meal planning will be dealt with. Students will also be introduced to dietary guidelines for Indians.



The concept of estimated average requirements, recommended allowances and methods of assessing nutrient requirements in general for Indians will be explained.

- Food groups
- Food exchange list
- Factors affecting meal planning and food related behaviour, diet diversity
- Dietary guidelines for Indians
- Concept of EAR, RDA and TUL
- Basic concepts of assessment of nutrient requirements

## **UNIT II: Nutrition during Adulthood and Old Age**

**12 Hours**

Physiological influence on nutrient requirements during adulthood and old age (EAR/RDA), energy balance, nutritional concerns and changes in requirements during adulthood and old age, concept of healthy food choices, processed and ultra-processed food consumption and factors contributing to longevity will be dealt with.

- Adult men and women
- Elderly

## **UNIT III: Nutrition during Pregnancy and Lactation**

**9 Hours**

Physiological changes in pregnancy and lactation, EAR/RDA during pregnancy and lactation, nutritional guidelines, effect of nutritional status on pregnancy outcome, optimal weight gain and its components during pregnancy, nutrition related problems in pregnancy, importance of nutrition for successful lactation will be dealt with.

- Pregnant women
- Lactating mothers

## **UNIT IV: Nutrition during Childhood**

**12Hours**

Physiological changes during infancy, childhood and adolescence – growth and development; nutrient requirements (EAR/RDA) during these age groups, and nutrition concerns keeping in mind the changing food habits and importance of physical activity will be dealt with.

- Infant
- Preschool children
- Schoolage children
- Adolescents

## **PRACTICAL (Credits 1; Hours 30)**

1. Introduction to meal planning:
  - Rich sources of nutrients
  - Use of food exchange lists
2. Planning nutritious diets for:
  - Adult (Male and Female)
  - Pregnant and Lactating woman
  - Pre-schooler
  - Adolescent girl

- Elderly
- 3. Planning and cooking of nutrient rich snacks/dishes for:
  - Infants (Freshly prepared complementary foods)
  - Packed tiffin
  - Pregnancy/Lactation

#### **Essential Readings:**

- Chadha R and Mathur P eds. (2015). Nutrition: A Lifecycle Approach. Orient Blackswan, New Delhi
- ICMR-NIN Expert Group on Nutrient Requirements for Indians, Recommended Dietary Allowances (RDA) and Estimated Average Requirements (EAR)-2020 and subsequent revision
- Khanna K, Gupta S, Seth R, Passi SJ, Mahna R, Puri S (2013). Textbook of Nutrition and Dietetics. Delhi: Elite Publishing House Pvt. Ltd.
- NIN (2011). Dietary Guidelines for Indians-A manual. Second Edition. National Institute of Nutrition, Indian Council of Medical Research, Hyderabad. and subsequent revision

#### **Suggested Readings:**

- Byrd-Bredbenner C, Moe G, Beshgetoor D, Berning J (2013). Wardlaw's Perspectives in Nutrition, McGraw- Hill International Edition, 9th edition
- B Srilakshmi Eighth Edition (2019). Nutrition Science. New Age International Publishers.
- Longvah T, Ananthan R, Bhaskarachary K and Venkaiah K (2017). Indian Food Composition Tables. National Institute of Nutrition, Indian Council of Medical Research, Department of Health Research, Ministry of Health and Family Welfare, Government of India, Hyderabad.
- Punita Sethi, Poonam Lakra (2015). Aahar Vigyan Suraksha evam Poshan. Delhi: Elite Publishing House Pvt.Ltd
- Puri S, Bhagat A, Aeri, BT, Sharma A (2019). Food Exchange List: A Tool for meal Planning. Elite Publishing House. New Delhi.
- Siddhu, A, Bhatia, N, Singh, K, Gupta, S (2017). Compilation of Food Exchange List, Technical Series 6, Lady Irwin College, University of Delhi Publ. Global Books Organisation, Delhi.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time**

**DISCIPLINE SPECIFIC CORE COURSE**  
**DSC HP 412: Communication Systems**

**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		
<b>Communication Systems</b>	<b>4</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>XII Pass</b>	<b>Appeared in Fundamentals of Communication</b>

**Learning Objectives**

- To gain an in-depth understanding of various communication systems and their applications in personal and professional life.
- To acquire knowledge about the applications of communication transactions in the field of Development Communication.
- To appreciate and recognize the importance of understanding self through concepts of self-concept, self-esteem and self-disclosure.
- To understand the nuances of different levels of communication ranging from intra personal communication to organizational as well as intercultural communication.
- To throw light on the role of communication transactions in persuasion and influencing desired changes in individuals and groups.

**Learning Outcomes**

- Develop an understanding of various communication systems and their relevance.
- Comprehend the various levels of communication transactions and their applications in Development Communication approaches.
- Gain understanding of self through self-concept, self-awareness and self-esteem.
- Recognize and appreciate various communication networks in personal and professional spheres.
- Understand how mass communication and media impact society through mass communication theories and models and their significance.

## **SYLLABUS OF DSC-412**

### **THEORY (Credits 3; Hours 45)**

#### **UNIT I: Intrapersonal and Interpersonal Communication 9 Hours**

The Unit I elucidate upon the various levels of communication transactions. This Unit in particular lays thrust on the Intrapersonal and Interpersonal Communication Systems and processes.

- Overview of communication transactions
- Intrapersonal Communication - Self Development, Looking Glass Self Theory, Self-concept and self-esteem, Awareness of Self & Johari's Window, Self-Disclosure
- Interpersonal Communication - Functions, Types of relationships- friendship, families, other relationships, Stages of relationship development, Interpersonal Competence
- Theories of Relationship Development - Social Exchange Theory, Uncertainty Reductions Theory, Interpersonal Relationship Model

#### **UNIT II: Small Group and Organizational Communication 12 Hours**

Unit II highlights the small group communication characteristics, functions and power of group conformity. It emphasizes on the organizational communication with focus on culture and leadership.

- Small group communication: Characteristics, Functions & Types
- Small Groups & Social Influence, Power in small group Conformity, Group Think, Polarization, Social Loafing
- Theories of group formation - Functional Theory, Structuration Theory, Symbolic Convergence Theory, Participatory theory
- Small Group Processes: Culture, Structure, Roles & Leadership
- Organization - concept, types and relationship in organization
- Organizational communication: Types: Formal Informal, Internal External, Direction & Networks, Functions, Tools used by organizations, challenges
- Organizational Culture and Leadership

#### **UNIT III: Public, Intercultural and Mass Communication 12 Hours**

Unit III highlights the Communication networks in professional and public spaces. It provides insight into the dynamics of intercultural communication. It also highlights the various theories and models of mass communication and emphasizes the significance and characteristics of various mass media.

- Public communication - Concept, types, techniques and skills in public speaking, qualities of an effective public speaker, overcoming speaker apprehension
- Intercultural communication-concept, importance and relevance, stages and barriers
- Mass Communication - concept, significance, functions and elements
- Models and theories of mass communication

- Mass Media - Characteristics, classification, Evolution, significance of print, electronic and web-based media in contemporary society

#### **UNIT IV: Scope of Levels of Transactions in Communication**

**12 Hours**

Unit IV emphasizes how communication transactions help in persuading, influencing and bringing out desired changes in individuals and groups. It strives to give conceptual clarity about use of communication in addressing conflict and strengthening personal and professional relationships.

- Application of levels of communication transactions for Influencing ideas attitudes and beliefs of individuals and groups
- Communications and building Self-Confidence, Self-development identity and personal branding
- Communication in conflict management, relationship development and repair
- Business communication and strengthening organizational processes and efficacy
- Communication approaches for Behaviour Change

#### **PRACTICAL (Credit 1; Periods 30)**

1. Self-Awareness & Analysis of Communication with self
2. Media design and production for group and mass communication
3. Evaluating & Designing communications for changing attitudes
4. Evaluation of various communication strategies for social change

#### **Essential Readings:**

- Anand, S. & Kumar, A., 2016, Dynamics of Human Communication. Orient Black Swan, New Delhi.
- Foss, K. A., Oetzel J. G., 2021, Theories of Human Communication. Waveland Press
- Kumar, K. J., 2020, Mass Communication in India. Jaico Publishing House, Mumbai.
- McQuail, D., 2000, Mass Communication Theories. Sage Publications, London
- Patri, V. R. and Patri, N., 2002, Essentials of Communication. Greenspan Publications

#### **Suggested Readings:**

- Baran, S., 2014, Mass Communication Theory. Wadsworth Publishing
- Devito, J., 2012, Human Communication. Harper & Row, New York
- Greene, J.O., 2021, Essentials of Communication Skills and Skill Enhancement. Taylor & Francis
- Stevenson, D., 2002, Understanding Media Studies: Social Theory and Mass Communication, Sage Publications
- Zeuschner, R., 1997, Communicating Today. California State University, USA

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time**

**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HP 4A1 : Adolescent Relationships and Wellbeing**

**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		
<b>Adolescent Relationships and Wellbeing</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>XII Pass</b>	<b>Pass in Lifespan Development II: Middle Childhood and Adolescence</b>

**Learning Objectives**

- To study adolescent relationships across cultural contexts
- To understand adolescent relationships in relation to society, family and peers
- To understand well-being of adolescents and factors affecting wellbeing.

**Learning outcomes**

- The student will acquire knowledge about intra-personal and inter-personal adolescent relationships
- The student will develop an understanding of the concept and dimensions of wellbeing of adolescents in the contemporary social world.
- The student will engage in the use of various methods and tools to understand self and adolescence in diverse contexts

**SYLLABUS OF DSE HP 4A1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I Adolescence in diverse contexts**

**9 Hours**

- Definitions, social construction of adolescence
- Adolescence across different ecological settings
- Cultural and social influences on adolescence

## **UNIT II Understanding adolescent relationships**

**9 Hours**

- Family relationships: changing dynamics
- Peer relationships and friendships: self and identity; group dynamics
- Relationship with society and community
- Relationship beyond the family and peers: building intimate relationship

## **UNIT III Adolescent well- being**

**9 Hours**

- Challenges of adolescence: Self, identity and well-being
- Indicators of well-being - physical/health, mental/cognitive, social– emotional, spiritual and moral
- Factors and experiences that influence well-being
- Promoting life skills and well-being: counselling, yoga, meditation, mindfulness

### **PRACTICAL (Credits 2; Hours 60)**

1. Understanding self
  - SWOT analysis
  - Narratives/ autobiography/ diagrammatic representation of self
2. Understanding adolescence
  - Pilot research on understanding adolescence: well-being/ identity/body image
    - Interviews
    - Observations
    - Checklist
  - Movies/ documentaries/ videos
  - Book review
3. Promoting life skills and wellbeing: workshops/ lectures/ seminar
  - Socio-emotional well-being
  - Counseling/Yoga/Meditation
  - Life skills
  - Mindfulness

### **Essential Readings:**

- Erikson, E.H. (1968). *Identity, youth and crisis*. New York: Norton.
- Manthei, R. (1997). *Counselling: The skills of finding solutions to problems*. London: Routledge.
- Rice, F. P. (2007). *Adolescent: Development, Relationships and Culture*. inc: US, Allyn & Bacon.
- Santrock, J. W. (2010). *Life Span Development: A Topical Approach*, New Delhi: Tata McGraw Hill.
- Sharma, N. (2009). *Understanding Adolescence*, New Delhi: National Book Trust.

**Suggested Readings:**

- Damour, L. (2017). *Untangled*. Atlantic Books.
- Deb, S., Bhadra, S., Sunny, A. M., & Sahay, S. (2019). *Childhood to Adolescence: Issues and Concerns*. Pearson Education.
- <http://archive.unu.edu/unupress/sample-chapters/1130-UnderstandingHumanWell-Being.pdf> , understanding human well-being, chapter 1, pp 3-15.
- IGNOU. Introduction to counseling (Block 1)  
<https://egyankosh.ac.in/handle/123456789/23640>
- Jha, M. (Ed.) (2021). *Being an Indian Teenager*. Literaturelight Publishing.
- Morgan, N. (2018). *Positively Teenage*. Hachette Children's Group.
- Nair, M. K. C. (2010). *Adolescent Counselling*. Jaypee Brothers Medical Publishers.
- Notion Press (2022, December 14). *The Great Indian Teen Fiction Collective*.
- Ranganathan, N. & Wadhwa, T. (2017). *Guidance and Counselling for Children and Adolescents in Schools (India)*. SAGE Publications India Pvt Ltd.
- Saraswathi, T.S. (2003). *Cross-Cultural Perspectives in Human Development: Theory, Research and Applications*. SAGE Publications Pvt. Ltd
- Saraswathi, T.S. (2003). *The World's Youth: Adolescence in Eight Regions of the Globe*. Cambridge University Press
- Shah, G. J. & Thomas, S. (2021). *Adolescence in India*. Routledge India
- Smith, J. (2022). *Why Has Nobody Told Me This Before?* Harper One.

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HP 4B1 : Physiology and Promotive Health**

**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		
Physiology and Promotive Health	4	2	0	2	XII Pass	NIL

**Learning Objectives**

- To learn about the structural organization of the human body.
- To understand the normal functioning of the organ systems and their interactions.
- To learn about modes of transmission of common communicable diseases and their prevention.
- To learn web of causation of Non communicable diseases and lifestyle disorders

**Learning Outcomes**

- Understand the knowledge about the structural organization of the human body.
- Develop insight of normal functioning of all the organ systems of the body and their interactions.
- Understanding modes of transmission of common communicable diseases and their prevention.
- Understanding causes of Non communicable diseases and lifestyle disorders.

**SYLLABUS OF DSE HP 4B1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Cardio-Respiratory and Gastric Physiology.**

**8 Hours**

The unit presents the student with an understanding the structure and functioning of the Cardio-respiratory system and Gastro-Intestinal system.

### **Cardio-respiratory Physiology**

**3 Hours**

- Blood -Composition and function
- Blood circulations (systemic, pulmonary, coronary, and portal)
- Cardiac cycle, Heart Sounds &ECG
- Structure of lungs and its function

### **Gastro-intestinal Physiology**

**5 Hours**

- Structure of stomach, liver, gallbladder, pancreas, and their functions
- Composition, function and regulation of GI secretions

## **UNIT II Neuroendocrine, Renal & Reproductive Physiology**

**10 Hours**

The unit presents the student with the understanding of the structure and functions of the Neuroendocrine, Renal and reproductive system of the body.

### **Neuro-Endocrine Physiology**

**4 Hours**

- Organization of nervous system.
- Actions & disorders of Pituitary, Thyroid, Adrenal & Pancreatic hormones

### **Renal and reproductive Physiology**

**6 Hours**

- Structure of kidney and its function.
- Physiology of Menstruation, pregnancy, lactation, and Menopause

## **UNIT III Promotive Health and Community Health**

**12 Hours**

The unit presents the student with the understanding of the concept of health, disease and its prevention. This unit will also focus on communicable diseases, non-communicable diseases and community health.

### **Concept of Health, Disease, and its prevention**

**3 Hours**

- WHO definition of Health
- Epidemiological triad.
- Concept of Immunization, Immunization Schedule. Immunization during various stages of lifecycle of humans.
- Recent/Newer Vaccines
- Anticancer vaccines

### **Epidemiology of communicable diseases**

**4 Hours**

- Air borne infections: Tuberculosis, COVID
- Faeco-oral infections: Hepatitis, Enteric Fever

- Zoonotic diseases: Rabies
- Vector Borne diseases: Malaria & Dengue
- Sexually transmitted diseases: A.I.D.S

#### **Epidemiology of Non-communicable diseases**

**2 Hours**

- Hypertension
- Diabetes, PCOD
- Cancer

#### **Community Health**

**3 Hours**

- Maternal Health care: Antenatal Care, Family Planning, and Contraception
- Occupational health.

### **PRACTICAL (Credits 2; Hours 60)**

1. Case study of Iron deficiency Anemia, investigations and diagnosis.
2. Case Study of Enteric Fever
3. Case Study of Dengue
4. Case Study of HIV/AIDs
5. Measurement of Oxygen saturation by pulse oximeter and its relevance
6. Measurement of Blood pressure by using sphygmomanometer and its relevance
7. Clinical significance of variations in blood glucose and Diabetes mellitus. Use of Glucometer
8. Demonstration of clinical examination to see for pallor, cyanosis, jaundice, oedema and dehydration and their importance.
9. Basic First aid procedures and CPR
10. Preparation of a project on various contraceptive devices
11. Understanding Oncogenesis: Risk factors, danger signal & vaccines.

#### **Essential Readings:**

- Ganong WF (2019). Review of Medical Physiology, 26<sup>th</sup> ed. McGraw Hill.
- Guyton, AC. and Hall, JE (2011) Textbook of Medical Physiology, XII Edition, Harcourt Asia Pvt. Ltd/ W.B. Saunders Company. Longman Group Ltd.
- Marieb, E (2014). Human Anatomy and Physiology, 10<sup>th</sup> Edition, Addison-Wesley.
- Park JE and Park K (2021). Park's Textbook of Preventive and Social Medicine, 26<sup>th</sup> ed
- Bedi YP (2018), 17<sup>th</sup> Edition Handbook of Preventive and Social Medicine: Community Health/Community Medicine
- Practical Workbook of Human Physiology, K Sri Nageswari and Rajeev Sharma, 2<sup>nd</sup> Edition 2018
- Textbook of Practical Physiology, G K Pal and Pravati Pal 5<sup>th</sup> Edition (2020)
- A Textbook of Practical Physiology, CL Ghai, 8<sup>th</sup> Edition, (2013)

#### **Suggested Readings:**

- Ross and Wilson (2018). Foundation of Anatomy and Physiology, Medical Division 12<sup>th</sup> Edition

- Singh HD (2010). Handbook of Basic human physiology for paramedical students.
- <https://www.who.int/news-room/fact-sheets/detail/cancer> (Accessed March 19th 2023)
- <https://www.who.int/news-room/fact-sheets/detail/hiv-aids> (Accessed March 19th 2023)
- <https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue> (Accessed March 19th 2023)
- [https://www.who.int/health-topics/anaemia#tab=tab\\_1](https://www.who.int/health-topics/anaemia#tab=tab_1) (Accessed March 19th 2023)
- [https://www.who.int/health-topics/contraception#tab=tab\\_1](https://www.who.int/health-topics/contraception#tab=tab_1) (Accessed March 19th 2023)
- [https://nhm.gov.in/images/pdf/guidelines/nrhm-guidelines/stg/Hypertension\\_full.pdf](https://nhm.gov.in/images/pdf/guidelines/nrhm-guidelines/stg/Hypertension_full.pdf) (Accessed March 19th 2023)
- <https://nvbdcp.gov.in/Doc/National%20Guideline%20for%20Dengue%20case%20management%20during%20COVID-19%20pandemic.pdf> (Accessed March 19th 2023)
- <https://www.nhm.gov.in/images/pdf/guidelines/nrhm-guidelines/stg/stg-tb.pdf> (Accessed March 19th 2023)
- <https://www.nhm.gov.in/images/pdf/guidelines/nrhm-guidelines/stg/dengue.pdf> (Accessed March 19th 2023)

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HP 4C1 : NGO Management and Advocacy**

**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		
NGO Management and Advocacy	4	2	0	2	XII Pass	NIL

**Learning Objectives**

- To develop key management competencies and analytical in the management of NGOs.
- To develop understanding about the legal framework of NGOs and various issues/risk associated with NGOs.
- To develop basic understanding regarding the structure and functioning of NGOs with effective strategies for networking and fundraising
- To inculcate understanding of communication campaigning and advocacy with the importance of effective campaigning in achieving objectives and changing public policy through mediums like media, legislation, marketing, and advertising.

**Learning Outcomes**

The students would be able to:

- Gain an understanding of the unique nature of the non-government sector and distinguish it from the government (public) and business (for-profit) sectors.
- Explore the historical, theoretical, and legal perspectives on non-government organizations, as well as current trends and issues of consequence to non-government organizations.
- Develop an understanding of management techniques and leadership skills for enhancing the effectiveness of non-government organizations.
- Be able to design and assess the effectiveness of governance models, volunteer programs, organizational capacity, and inter-organizational relationships.

- Develop understanding of advocacy skills and knowledge and also key stages involved in developing an advocacy strategy.

## **SYLLABUS OF DSE HP 4C1**

### **THEORY (Credits 2; Hours 30)**

#### **UNIT I: Introduction to Non-governmental Organizations**

**10 Hours**

This unit introduces the concept and idea of non-governmental organizations, its relevance, and characteristics. It also provides an overview of the evolution NGOs, historical development of voluntary action with respect to the roles played by them within changing development frameworks.

- Meaning of NGO and GO and private sector
- Difference between Government Organizations and NGO
- Relationship between NGO, GO and private sector
- Characteristics of good NGO
- Structure of NGO
- Functions of NGO
- Classification of NGOs
- Historical evolution of NGOs
- Growth and status of NGOs in India
- Contribution and Role of NGOs in Development
- Mapping Voluntarism in the Third sector
- Challenges faced by NGOs.

#### **UNIT II: Management of Non-governmental Organizations**

**12 Hours**

This unit elaborates on the organizational structure and the various aspects of establishing and running an NGO. It focuses on the numerous challenges, problems and issues associated with NGOs. It elucidates about the different managerial strategies of NGOs, through planning, implementing, and monitoring activities strategically.

- Organizational types and structures
- Registration of NGO
- Legal Procedures for Establishment of NGOs
- Overview of Societies Registrations Act, India's Companies Act, Charitable Endowment Act and FCRA, Memorandum of Association and Bye Laws
- Tax Relief Under Section 80G
- Management of NGOs

- NGO management competencies
- Human Resource Management- Human Resource Policy, Staffing and Salaries
- Selection and training of Personnel
- Managing people and teams in NGOs
- Communication and Networking in NGOs
- Planning, Implementation and Evaluation strategy under NGO
- Fundraising
- Resource mobilization

### **UNIT III- Introduction to Advocacy**

**8 Hours**

This unit describes the concept of advocacy and campaigning highlighting its relevance, in the contemporary times. It focuses on the process of advocacy and planning an advocacy campaign. It explores the relationship between advocacy, programme communication and social mobilization through diverse platforms

- Concept and relevance of Advocacy
- Types or approaches of Advocacy
- Steps in planning an Advocacy Campaigns
- Tools and Techniques of Advocacy
- Elements of an advocacy strategy
- Advocacy Planning Cycle - planning advocacy campaigns for different stakeholders
- Case studies of advocacy campaigns
- Community Advocacy
- Media Advocacy
- Relationship between advocacy, programme communication and social mobilization

### **PRACTICAL (Credits 2; Hours 60)**

1. Visit to Non-government organizations
2. Profiling of NGOs
3. Evaluation of promotional/IEC materials developed by NGOs
4. Case studies and Evaluation of Advocacy Initiatives/ Campaigns
5. Planning an advocacy campaign

### **Essential Readings:**

- R. Kumar, S. L. Goel. (2005). Administration and Management of NGOs: Text and Case Studies Paperback. Deep & Deep Publications, India. ISBN 8176296015.
- S. Chandra (2003). Guidelines for NGO Management in India. Kanishka Distributors, New Delhi. ISBN 978-8173916038.

- D. Lewis (2001). Management of Non-Governmental Development Organization. Second Edition, Routledge, New York. ISBN 9780203002162.
- Subedi, N R, (2008). Advocacy Strategies and Approaches: A Training of Trainers Manual. International Centre for Integrated Mountain Development (ICIMOD). ISBN : 9291150830
- Abraham, A. (2003). Formation and Management of NGOs. Third Edition, Universal Law Publishing Co. Pvt Ltd., New Delhi. ISBN 9350350122.

**Suggested Readings:**

- Sundar, P. (2013). Business and Community: The Story of Corporate Social Responsibility in India. New Delhi, Sage Publication. ISBN 978-81-321-0955-6.
- Agarwal, S.K. (2008). Corporate Social Responsibility in India, Sage publication Pvt. Ltd. <https://doi.org/10.4135/9788132100027>.
- Lewis. D. (2014). Non-governmental Organizations: Management and Development. 3<sup>rd</sup> Edition. Routledge. ISBN 9781138294097.
- Til, J.V. (1988). Mapping the Third Sector: Voluntarism in a Changing Social Economy. Foundation Centre, New York. ISBN 0879542403.

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HP 4D1 : Fabric Construction**

**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		
<b>Fabric Construction</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>XII Pass</b>	<b>NIL</b>

**Learning Objectives**

- To provide students with knowledge of various production techniques.
- To learn about the various standard test methods required for the evaluation of various types of fabrics

**Learning Outcomes**

- Demonstrate an understanding of various types of fabric forming methods.
- Familiarise students with the types and scope of technical textiles.
- Acquire skills to inspect, manage and control quality in the textile industry.

**SYLLABUS OF DSE HP 4D1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Weaving**

**10 Hours**

- Structure and components of woven fabric: warp, weft, selvedge, grain
- Yarn preparation for weaving
- Weaving operations
- Types of Loom: shuttle and shuttleless looms
- Types of weaves: Basic and Decorative
- Blended Fabrics

**UNIT II: Knitting****8 Hours**

- Structure and components of knitted fabric: courses, wales
- Yarn preparation for knitting
- Knitting needles
- Knitting process and machines
- Knit fabric stitches
- Knitted fabric classification: Warp and Weft knits
- Techniques for knitwear production- fully-cut, fully-fashioned and integral.

**UNIT III: Non-wovens****6 Hours**

- Production of non-woven
- Types of non-woven fabrics and their properties
- Application in various sectors- apparel and industrial

**UNIT IV: Other methods of fabric construction****4 Hours**

- Nets
- Laces
- Braiding
- Knotting

**UNIT V: Technical Textiles****2 Hours**

Definition and Examples

**PRACTICAL**  
**(Credits 2; Hours 30)**

1. Yarn Count : Direct and Indirect
2. Dimensional Stability of cotton and wool and knitted fabric
3. Identification of weaves, point paper diagrams
4. GSM
5. Drape
6. Crease recovery
7. Bending length
8. Tear strength
9. Fabric analysis

**Essential Readings:**

- Brackenbury, T. (2005). *Knitting Clothing Technology*, Blackwell Science Publishers
- Corbman P. B., (1989), *Textiles- Fibre to Fabric*, 6th edition, Mc Graw Hill, New York.
- Horrock A.R. and Anand, S.C. (2000). *Handbook of Technical Textiles*, Cambridge: Woodhead Publishing.
- Joseph, M.L., (1988) *Essentials of Textiles* (6th Edition), Holt, Rinehart and Winston Inc.,

Florida.

- Rastogi, D. and Chopra, S. (Ed) (2017) *Textile science*, India: Orient Black Swan Publishing Limited.
- Sekhri S. (2022) *Textbook of Fabric Science: Fundamentals to Finishing*, 4E, Delhi: PHI Learning Private Ltd.
- Sekhri S. (2023) , वस्त्र विज्ञान (Vastra Vigyaan). Delhi: PHI Learning Private Ltd.
- Spencer, D.J. (2005) *Knitting Technology: A Comprehensive Handbook and Practical Guide*, 4th ed. Cambridge: Woodhead Publishing.

**Suggested Readings:**

- Booth, J. E. (1964) Principle of textile testing an introduction to physical methods of testing textile fibers, yarns, and fabrics. 2nd Edition. London: Meanness Butterworths.
- Saville, P. B. (1999) Physical testing of textiles. Cambridg: Woodhead Publishing Limited.
- Skinkle, J.H. (1940) Textile Testing. New York: Chemical Publishing Co. Inc. Brooklyn

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HP 4E1 : Human Capital Management**

**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		
Human Capital Management	4	2	0	2	XII Pass	Appeared in Introduction to Resource Management

**Learning Objectives**

- To understand the importance of human capital and their effective management in an organisation.
- To comprehend functions of human capital management.
- To sensitize towards the emerging trends and applications of human capital management.

**Learning outcomes**

After completing the course, students will be able to :

- Develop an understanding about the discipline of human capital management.
- Acquire knowledge about the functions and key areas of human capital management as a people's dimension.
- Gain insight into emerging trends and modern practices in the field of human capital management for growth and optimizing performance.

**SYLLABUS OF DSE HP 4E1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Human Resource Management**

**4 Hours**

The focus of this unit would be on developing the fundamental concepts of human resource management and its applicability in changing business environment.

- Concept, functions, roles, skills and competencies
- Changing environment of HRM- Globalization, corporate downsizing, cultural environment, work force diversity, changing skill requirement, technological changes.
- HRM support for improvement programs -re engineering processes, contingent workforce, decentralized work sites.

## **UNIT II: Human capital: concept and data**

**10 Hours**

This unit attempts to acquaint the students in understanding the functions of human capital management.

- Human capital concept, HRM vs HCM
- Human resource & capital management Concept, functions, roles, competencies
- Process of HCM, HCM drivers, Human capital measurement journey, measuring HR.
- Human capital data, types of data, a guide to data management.
- Measuring human capital, classification of measures.
- Approaches to measurement

## **UNIT III: Human Capital Management**

**10 Hours**

This unit will help students to gain insights about the components of HR system used in an organization for auditing purposes to check its effectiveness.

- Measuring human capital, measurement issues, classification of measures, developing measures- measurement models (human resource accounting, balance scorecard, HR scorecard, workforce scorecard)
- Human capital monitor
- Organizational performance model
- Human capital index
- Engagement model
- People and performance model

## **UNIT IV: Applications of HCM**

**6 Hours**

This unit will help students to understand the applications of HCM

- Human capital value
- HCM and strategic HRM
- HCM and talent management
- Performance and reward management

## **PRACTICAL**

**(Credits 2; Hours 60)**

1. Human Capital Management
  - Analysis of human capital management environment and HR audit in an organization through case-studies.
  - Understanding human capital management practices
2. Human Capital Management: Functions and Key Areas
  - Human capital metrics viz-a-viz key performance indicators
  - Performance appraisal and management (methods)
  - Simulation on human capital data management and talent management.
3. Applications of HCM
  - Introduction to HCM tools and HCMS application
  - Preparation of HCM tool as per modern workforce trends for optimizing productivity.

### **Essential Readings:**

- Aswathappa K. (2021). *Human Resource Management Text and Cases* (9th Ed.) McGraw Hill Education India.
- Decenzo, D. A., & Robbins, S. P. (2011). *Fundamentals of Human Resource Management*. Wiley.
- Dessler G. (2020). *Human Resource Management*. Prentice Hall of India Pvt. Ltd.
- Mark Salsbury (2021) *Human Capital Management: Leveraging Your Workforce for a Competitive Advantage*.
- Rao, V.S.P. (2010). *Human Resource Management*. (3rd ed.) Excel Books.
- Wilson Wong, Valerie Anderson, Heather Bond. (2019) *Human Capital Management Standards, A Complete Guide*. Kogan publisher.

### **Suggested Readings:**

- Ivanecevich, J.M.(2010). *Human Resource Management*. (10<sup>th</sup> ed.). Tata McGraw Hill Education Pvt. Ltd.
- Noe, R.A., Hollenbeck, Gerhart and Wright (2012). *Fundamentals of Human Resource Management* .(3rd ed.), McGrawHill Education Ltd.
- Subbaroo, R. (2007). *Personnel and HRM – Text and Cases*. Himalaya Publishing House.
- Vance, C.M. and Paik, Y. (2009). *Managing a Global Workforce: Challenges and Opportunities in International Human Resource Management*. PHI Learning.

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**Department of Home Science**  
**Semester – V**

**B.Sc. (Prog.) Home Science**

**DISCIPLINE SPECIFIC CORE COURSE**  
**DSC HP 513: Space Planning and Sustainability**

**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		
Space Planning and Sustainability	4	3	0	1	XII Pass	Appeared in Personal Finance and Consumer Education

**Learning Objectives**

- To understand the fundamentals of space planning.
- To acquire knowledge regarding materials, building construction techniques and technologies.
- To comprehend sustainable parameters in space design.

**Learning Outcomes**

- Comprehend the concept of design applicable to interior spaces.
- Understand the application of materials and finishes to create aesthetic and sustainable interiors.
- Comprehend the concept of sustainability and green rating systems.

**SYLLABUS OF DSC HP 513**

**UNIT I: Basic Concepts in Space Planning**

**10 Hours**

This unit will develop understanding regarding the concept of space planning and designing.

- Concept of space as a resource, characteristics of space
- Principles of planning spaces
- Zoning
- Types of houses: Independent houses and Apartments.
- Contemporary Housing - Service Apartments, Senior living.
- Building bye-laws – NBC and MPD

**UNIT II: Construction Features in Building Design****15 Hours**

This unit will acquaint students with various elements of building construction important for developing a strong structure.

- Site selection
- Conventional and Non-conventional building materials, sustainable building materials
- Structural components of a building (Material and Types) – Foundation, Walls, Flooring, Roofs, Doors and Windows, Staircase.
- Basic building services
- Landscaping
- Earthquake resistant structures
- Home Automation

**UNIT III - Concept of Space Design****15 Hours**

This unit will introduce students to the area of space design such as elements and principles of design, furniture and furnishings and wall treatment.

- Introduction to Elements and Principles of design
- Concept of Colour in Interior Design - Colour Theories, Colour Psychology, Colour Schemes, Colour Forecasting
- Energy Efficient Lighting Systems.
- Furniture - Types, Selection criteria, Arrangement
- Furnishings - Home Furnishing, Window treatment, Floor Coverings
- Wall treatment
- Use of sustainable material in space design

**UNIT IV: Sustainable built environment****5 Hours**

This unit will introduce students to the concept and application of sustainability in built environment.

- Introduction to sustainable built environment
- Green building rating guidelines in India – GRIHA and LEED
- Concept of Smart Cities

**PRACTICAL**  
**(Credits 1; Hours 30)**

1. Introduction to building terminologies, Concept of Scale, building constructions symbols
2. Evaluation of floor plans on the basis of principles of space planning
3. Preparation of floor plans
  - Multipurpose rooms/ studio apartment (Computer aided / manual)
4. Identification and characteristics of different building materials
5. Case study of a Green Building
6. Project on Landscaping / Home Automation



**Essential Readings:**

- Goel S., Seetharaman P. Kakkar, A. (2015). *Manual on Interior space designing*, Elite publishers.
- Goldstein, H. & Goldstein, V. (1988). *Art in Everyday Life (4th ed.)*, Oxford & IBH Publishing Co.
- Indian Green Building Council. (2022). *Introduction to Green Buildings and Built Environment*, BSP Books.
- Kumar, S. (2008). *Building Construction*, Standard Publisher.
- Rao, M.P. (2020). *Interior Design Principles and Practices*, Standard Publishers Distribution.

**Suggested Readings:**

- Duggal S.K. (2017). *Building Materials*. CRC Press.
- Green Rating for Integrated Habitat Assessment (GRIHA). (2021). *GRIHA Manuals*, GRIHA Council.
- Grimley, C. and Love, M. (2018). *The Interior Design Reference & Specification Book*, Rockport Publishers.
- Indian Green Building Council. (2021). *IGBC Manuals*, IGBC.
- Iyer, G. H. (2022). *Green Building Fundamentals*, Notion Press.
- Mitton, M. and Nystuen, C. (2021). *Residential Interior Design: A Guide to Planning Spaces (4th ed.)*, Wiley.
- Singh, G. (2019). *Building Construction and Materials*, Standard Publishers.

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**DISCIPLINE SPECIFIC CORE COURSE**  
**DSC HP 514: INDIAN TEXTILE HERITAGE**

**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		
Indian Textile Heritage	4	3	0	1	XII Pass	Appeared in Fundamentals of Textiles

**Learning Objectives**

- To study the traditional textile arts in their historical perspective, the impact of modernization and their contemporary status.
- To create awareness about the khadi, handloom and handicraft sectors and measures undertaken by organisations for their sustenance.
- To impart knowledge of fundamentals of textile storage and conservation

**Learning Outcomes**

- Explain history, construction and design of selected traditional woven fabrics.
- Recognize and identify embroidered fabrics of different states in terms of stitches and designs.
- Describe our heritage of varied dyed, painted and printed fabrics.
- Provide an insight into the evolution and socio-economic significance of khadi, handloom and handicraft sectors.
- Discuss sustenance of traditional textile crafts and interventions by organisations.
- Analyse the textile arts in their historical perspective, the impact of modernisation and their contemporary status.
- Classify conservation techniques and recognize signs of deterioration of textiles.
- Carry out care and conservation of traditional textiles

**SYLLABUS OF DSC HP 514**

**THEORY**

**(Credits 3; Hours 45)**

**UNIT I: Study of Textile Crafts of India: with reference to history, production centers, techniques, designs, colours and products.**

This unit lays thrust on history, making and design details of various textile crafts of India

- Classification of Traditional Indian Textiles, craft centres. **6 Hours**
- Woven Textiles-Banaras Brocades , Jamdanis and Baluchars of Bengal, Kani Shawls of Kashmir, Kanjivaram sarees of Tamil Nadu **6 Hours**
- Embroidered Textiles-Kanthas of Bengal, Kasuti of Karnataka, Phulkari of Punjab, Chikankari of Uttar Pradesh, Kashida of Kashmir, Gujarat embroideries **8 Hours**
- Painted and Printed textiles –Kalamkaris of Andhra Pradesh, Dabu printing of Rajasthan, Ajrakh printings of Gujarat **6 Hours**
- Dyed textiles –Bandhnis of Rajasthan and Gujarat, Ikats- Patola of Gujarat **4 Hours**

#### **UNIT II: Status of Traditional Textiles in Modern India 7 Hours**

This unit highlights on the socio economic importance of the traditional textile industries. It also emphasizes on the role of organizations in sustenance of textile crafts

- Evolution and socio-economic significance of Khadi, Handloom and Handicraft sector
- Sustenance of traditional textile crafts
- Interventions by organizations

#### **UNIT III: Conservation of Textiles 8 Hours**

This Unit highlights on very important area - Conservation of textiles. It provides insight into the types of conservation along with degradation factors that affect textiles. It also highlights the care and storage methods that can be used to prolong the life of textiles

- Types of Conservation- Preventive and Curative
- Factors affecting deterioration of textiles
- Care and storage of textiles

### **PRACTICAL (Credit 1; Hours 30)**

1. Resist Dyeing Techniques
  - Tie & dye using various techniques on natural fabrics
  - Batik on cotton
2. Printing
  - Block printing: pigment
  - Screen printing: pigment
3. Embroidery stitches of traditional embroideries
4. Portfolio development-Traditional textile crafts
5. Product development
6. Visit to craft centers/museums: Craft documentation report on any one craft

#### **Essential Readings:**

- Agarwal, O.P., 1977, Care and Presentation of Museum projects – II, NRL
- Barnard, N., Gillow, J., 1993, Indian Textiles, Thames and Hudson, USA
- Chattopadhyaya, K.D., 1995, Handicrafts of India, Wiley Eastern Limited, N Delhi
- Crill, R., 2015, The Fabric of India, Victorial and Albert Museum, UK

- Das, Shukla, 1992, Fabric Art- Heritage of India, Abhinav Publications, N Delhi.
- Evaluation study on khadi and village industries programme, (2001) Programme evaluation organization planning commission government of India, New Delhi. Chapter 1 & 2, pg 1-9
- Grundy & Northedge, (1998) Standards in the Museum Care of Costume and Textile Collections, Museums & Galleries Collection, Spin Offset Limited, Chapter 7-14, pg 35-54
- Mausumi Kar, (2015), The Indian Textile and Clothing Industry An Economic Analysis, Springer New Delhi Heidelberg New York Dordrecht London, Chapter 1& 2, pg 12-33.
- Pandit Savitri, 1951, Indian Embroidery- Its Variegated Charm, Pandit Publisher, Baroda  
Embroidery tutorials, video links of woven textiles and slide share

**Suggested Readings:**

- Annual Report, (2002-2003), Handloom Industry, Ministry of textiles, Chapter 5, pg 1-20
- Chelna Desai, 1988, Ikats Textiles of india, Chronicle Books, India
- Craft Documentaries on Youtube; As accessed on Mar. 2023
- Pandit Savitri, 1951, Indian Embroidery- Its variegated charm, Pandit Publisher, Baroda
- Karolia, Anjali, 2019, Traditional Indian Handcrafted Textiles, Niyogi Publishers

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time**

**DISCIPLINE SPECIFIC CORE COURSE -15**  
**DSC HP 515: Extension Management**

**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		
Extension Management	4	3	0	1	XII Pass	Appeared in Communication Systems

**Learning Objectives**

- To orient the students to the concept and scope of extension in development.
- To understand the principles and process of Extension Programme Design and Management.
- To develop skills for using participatory approaches in Extension Programme Management.
- To provide knowledge about various development schemes and programmes in India.

**Learning Outcomes**

The students would be able to:

- Learn the concept of extension in a holistic manner with respect to national development.
- Get insights on the principles and process of Extension Programme Design and Management.
- Develop skills for using various participatory approaches in a programme management.
- Gain knowledge of various development schemes and programmes in India.

**SYLLABUS OF DSC HP 515**

**THEORY**  
**(Credits 3; Hours 45)**

**UNIT I: Extension: concept and principles**

**9 Hours**

This unit provides deeper understanding on the fundamental concepts of Extension and its application to national development.

- Extension: history, concept, goals, philosophy and scope
- Typology of extension and approaches to Extension
- Concept of Andragogy, Andragogy vs. Pedagogy

- Principles of Extension
- Relationship between Communication and Extension - role of Extension in development
- Methods of community contact in Extension

## **UNIT II: Stakeholder, Participation and Leadership**

**12 Hours**

This Unit highlights the significance of people's participation as a pre-requisite in any extension programme and develop skills in the same.

- Stakeholders in development
- People's participation and social mobilization in development, typology of participation
- Participatory Learning and Action – concept, principles, classification of tools and techniques
- Leaders in extension – functions, types and leadership styles and theories
- Diffusion of innovation and adoption – concept, theory and application

## **UNIT III: Programme Management**

**12 Hours**

This unit emphasizes on the principles and process involved in designing a programme and its management. The unit also gives conceptual clarity on project cycle and the different models of extension programme management.

- Project cycle- goals, objectives, indicators, outputs and outcomes
- Conceptual framework and Principles of extension program management
- Models of extension programme management - overview of models, Sandhu's model, Logic model
- Monitoring and Evaluation

## **UNIT IV: Development Programmes**

**12 Hours**

This unit provides an in-depth understanding of the various development schemes and programmes initiated as part of extension.

- Development issues and goals- national and international perspectives, Sustainable Development Goals
- Contemporary National Development Programmes (related to education, employment, income, health and nutrition, digitalization and women) – objectives, target groups, salient features, monitoring and evaluation, partnership and funding, outcomes and communication support

## **PRACTICAL** **(Credit 1; Hours 30)**

1. Assessing the leadership skills in a case-study format
2. PLA as needs assessment tools
3. Approaches to the Adult Education
4. Developing skills in planning and using individual and small group methods in extension

## **Essential Readings:**

- Beck, S., 2022, Communication in the 2020s. Routledge, New York
- Kumar, S., 2002, Methods for community participation: a complete guide for practitioners. Vistaar Publications, New Delhi
- Ray G.L., 2015, Extension, Communication and Management, Kalyani Publications, New Delhi
- Sandhu, A S., 2018, Extension Programme Planning. Oxford and IBH Publishers, New Delhi
- Singh, S., 2022, A Brief Book on Extension Education. New Vishal Publications, New Delhi
- Singh, A K., 2020, Frontline Extension in India Innovations and Reforms. Biotech Publisher, New Delhi
- Supe, S V., 2019, An Introduction to Extension Education. Oxford & Ibh Publishing Co. Pvt Ltd, New Delhi

#### **Suggested Readings:**

- Bhatnagar. O.P & Dahama, O.P., 2009, Education and Communication for Development 2ed. Oxford & IBH Publishing Co. Pvt Ltd, New Delhi
- Dale R., 2004, Evaluating Development Programmes and Projects. Sage Publications, New Delhi
- Kumar & Hansra, 2000, Extension Education for Human Resource Development. Concept Publishing Company, New Delhi
- Mikkelsen, B., 2002, Methods for Development Work and Research. Sage Publications, New Delhi

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HP 5A1 : Developmental Delay and Disability in Childhood**

**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		
Developmental Delay and Disability in Childhood	4	2	0	2	XII Pass	Appeared in Lifespan Development II: Middle Childhood and Adolescence

**Learning Objectives**

- To understand the perspectives and models of disability.
- To know major types of disabilities, the causes, prevention, characteristics of the disabilities and barriers which persons with disability face.
- To understand importance of early identification and early intervention, and inclusion.

**Learning outcomes**

- Students will understand concept of disability.
- Students will be able to demonstrate understanding and knowledge of the etiology of a wide range of disabilities.
- Students will understand and demonstrate knowledge of the characteristics of children with different disabilities.
- Student will learn simple skills for planning classroom activities for children with disabilities.

**SYLLABUS OF DSE HP 5A1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I - Introduction to Disability**

**6 Hours**

Unit Description: The unit will provide an understanding of the meaning of disability and developmental delays and help understand how disability is defined through various models,



Subtopics:

- Definition of disability
- Models of disability
- Social construction of disability
- Linking disability to delay in development

## **UNIT II- Types of Disabilities: causes and symptoms**

**14 Hours**

Unit Description: The unit will focus on major disabilities, their causes, signs and symptoms.

Subtopics:

Causes, Signs and Symptoms of the following disabilities

- Physical disabilities
- Intellectual disability
- Sensory disabilities
- Visual and auditory
- Learning disability
- Autism

## **UNIT III- Strategies for rehabilitation**

**10 Hours**

Unit description: This unit will help students develop an understanding of the role of family, legal system and best practices in rehabilitation of children with disabilities

Subtopics:

- Role of family
- Legal provisions
- Early identification and early intervention
- Inclusion

## **PRACTICAL (Credits 2; Hours 60)**

### **UNIT I**

**30 Hours**

- Exploring audio-visual sources with reference to children with disabilities and their families.
- Understanding barriers to disability using interviews, questionnaires, surveys.
- Visits to organizations working with children with disabilities.
- Observations of children with disabilities.  
Case profile of a child with disability / an organisation working with disability.

### **UNIT II**

**30 Hours**

- Preparing developmental checklists for assessment of developmental delays.
- Planning developmentally appropriate material for children with disabilities
- Preparing IEC material for generating awareness in community about disabilities.
- Selected psychometric tests (Raven Progressive Matrices, Portage, Tests for detecting Learning Disabilities, Disability Screening Schedule)

### **Essential Readings:**

- Chopra,G., (2012). Early Detection of Disabilities and persons with disabilities in the

community. New Delhi: Engage publications.

- Chopra, G., (2012). Stimulating Development of Young Children with Disabilities at Anganwadi and at Home: A Practical Guide. New Delhi: Engage publications.
- Heward, W.L., (Ed) (2000). Exceptional children: An introduction to special education. New Jersey: Prentice-Hall Inc.,
- Hardman, M.L., Drew ,C.J., Egan, M.W. (2014) Human exceptionality: School, Community and Family. Wadsworth Cengage Learning
- Mangal, S. K. (2007). Exceptional children: An introduction to special education. New Jersey: Prentice-Hall Inc.,
- Premananda M., Srinivas R., K. Sridevi, (2019) Introduction to Disabilities. 1<sup>st</sup> edition Neelkamal Publications

**Suggested Readings:**

- Chopra, G. (2015). Child rights in India: Challenges and social action. New Delhi: Springer (India) Pvt. Ltd., Chapter 9, pg 205-233
- Mastropieri, M. A., & Scruggs, T. E. (2004). The inclusive classroom: Strategies for effective instruction. NY: Pearson.
- Werner, D. (Ed) (2018). Disabled village children: A guide for community health workers, rehabilitation workers, and families. United States of America: Hesperian Health Guides.

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HP 5A2 : Laws, Policies and Programmes for Children, Women and Families**

**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		
Laws, Policies and Programmes for Children, Women and Families	4	2	0	2	XII Pass	Appeared in Lifespan Development II: Middle Childhood and Adolescence

**Learning Objectives**

- To orient students to the concept of child rights
- To familiarize them with the existing laws, policies and programmes for children, women and families
- To gain an understanding of the implementation process of policies and programmes for children, women and families and the role of various stakeholders.

**Learning Outcomes**

- The students will understand why child rights are important
- The students will demonstrate an understanding of current social policies for children and women in India
- The students will develop understand the policies and programmes for children, women and families

**SYLLABUS OF 5A2**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Introduction to the Rights based Approach**

**8 Hours**

The focus of this unit would be on developing an understanding of the concept of rights, international conventions and constitutional provisions.

Subtopics:

- Concept of Child Rights and why they are important
- Situational analysis of children in India
- Children in difficult circumstances

- Factors of exclusion- socio-economic, gender, geo-political
- International Conventions on the rights of children, women, and families

## **UNIT II: Legislations for Children, Women and Families**

**14 Hours**

This unit will help students to gain insight into the laws concerning children, women and families

Subtopics:

- Laws for children: Juvenile Justice Act, Protection of Children from Sexual Offences Act, Child Labour Prohibition & Regulation Act, Prohibition of Child Marriage Act
- Laws for Women: Prenatal Diagnostics Techniques Act, Dowry Prohibition Act, Protection of Women from Domestic Violence Act, Sexual Harassment of Women at Workplace
- Family Laws: Guardians and Wards Act, Hindu Adoption and Maintenance Act, Special Marriage act, Maintenance and Welfare of Parents and Senior Citizens Act

## **UNIT III: Policies, Programmes and the Implementation process**

**8 Hours**

This unit attempts to acquaint the students with the various facets of the policies and programmes for children, women and families and the role of the various stakeholders in the implementation process

Subtopics:

- Constitutional Provisions for children and women
- Policies for children, women, and families
- Major Programmes for children, women, and families
- Role of Government, Public-private partnership, NGOs and CSR in the implementation of programmes

## **PRACTICAL (Credits 2; Hours 60)**

1. Interview of children in difficult circumstances exploring their lives
2. Survey to explore awareness of child rights and laws for women and children
3. Preparing PPTs and making presentations on vulnerable groups of children
4. Focus group discussion to understand gender realities in different social groups
5. Understanding the concept of rights through audio/visual aids (Movies/Documentaries)
6. Visit government (CWCs, Observation Homes) and non-government institutes/centres working for specially disadvantaged groups of children
7. Review of research papers on the issues of rights of children of specially disadvantaged groups and women rights
8. Preparing posters/flipbooks/social media content for advocacy of laws
9. Workshops/Lectures to understand the various aspects of the implementation of laws and policies
10. Program planning of a workshop for creating awareness of policies and programmes

### **Essential Readings:**

- Bhargava, V. (2005). *Adoption in India: Policies and Experiences*. Sage Publications.
- Chopra, G. (2015). *Child rights in India: Challenges and social action*. Springer
- Chopra, G. (2021). Child protection in India: From silos to systems. In S. Puri (Ed.),

Children

India: Opportunities and Challenges (25-42), Nova Science Publishers.

<https://pesquisa.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/resource/pt/covidwho-1801302>

- Gangoli, G. (2016). *Indian feminisms: Law, patriarchies and violence in India*. Routledge.
- Halder, D. (2018). *Child sexual abuse and protection laws in India*. SAGE
- Jancic, C. O. (2016). (Ed.). *The Rights of the Child in a Changing World 25 Years after the UN Convention on the Rights of the Child*. Springer.
- Rathore, V. (2019). *An insight into Indian Juvenile Justice System*. Notionpress.
- Selected Legislations for Children and Women. Ministry of Women and Child Development GOI website [www.wcd.nic.in/](http://www.wcd.nic.in/)
- United Nations Development Programme. (2022). *Human Development Report 2021-22*. <https://hdr.undp.org/content/human-development-report-2021-22>

**Suggested Readings:**

- Agnes, F. (1999). *Law and Gender Inequality: The Policies of Women's Rights in India*. Oxford University Press.
- Bajpai, A. (2017). A child's right to a family: Deinstitutionalization—In the best interest of the child. *Journal of National Human Rights Commission*, 16, 199–216. [http://nhrc.nic.in/sites/default/files/nhrc\\_journal\\_2017.pdf](http://nhrc.nic.in/sites/default/files/nhrc_journal_2017.pdf)
- Biswas, T. (2008). *Human Rights, Gender and Environment*. In N. Pradhan (Ed.), *Laws, Institutions and Rights in India*. Viva Books.
- Begum, S. M. (Ed.). (2000). *Human Rights in India: issues and perspectives*. APH Publishing.

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HP 5B1: Nutritional Biochemistry**

**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		
Nutritional Biochemistry	4	2	0	2	XII Pass	Appeared in Foundation of Food Science and Nutrition

**Learning Objectives**

- To provide basic concepts of biomolecules, the basic building blocks vital for various life forms
- To focus on key structures, properties and biological functions of biomolecules

**Learning Outcomes**

- Understanding of the biochemical basis of macro- and micro- nutrients
- Developing an insight into structures, functions and biochemical role of carbohydrates, proteins, lipids, vitamins and minerals.

**SYLLABUS OF DSE HP 5B1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Unit I: Carbohydrates**

**8 Hours**

This unit lays emphasis on structures, properties and significance of carbohydrates.

- Introduction, definition and classification
- Structures of monosaccharides- glucose, fructose, mannose and galactose
- Structures of disaccharides – maltose, lactose and sucrose
- Structures and biological role polysaccharides– dextrin, starch and glycogen
- Stereoisomerism of monosaccharides (Keto-aldo, D- and L-isomerism, optical isomerism, epimerism and anomerism)
- General chemical properties of monosaccharides (oxidation, reduction, osazone

formation, action of alkali and glycoside bond formation)

## **UNIT II: Lipids**

**6 Hours**

This unit highlights on definition, classification and biological role of fatty acids and lipids.

- Introduction and structures of fatty acids (saturated and unsaturated)
- Essential and non-essential fatty acids
- Acid value, iodine value, saponification value and hydrogenation
- Definition, classification and functions of lipids  
(storage lipids-triacylglycerols; Membrane lipids-phospholipids and sphingolipids)

## **UNIT III: Amino acids and Proteins**

**10 Hours**

This unit gives an overview of amino acids and their role as building blocks of proteins.

The students would acquire knowledge on structure of proteins. The unit would also cover basic concepts of enzymes and their catalytic action.

- Introduction, classification and structures of standard amino acids
- Essential and non-essential amino acids
- Elementary knowledge of structure of proteins
- Introduction to enzymes, active site, co-enzymes, prosthetic groups,
- apoenzyme and holoenzyme
- Factors affecting enzyme activity: pH, temperature and substrate concentration ( $K_m$  and  $V_{max}$ )

## **UNIT IV: Vitamins and Minerals**

**6 Hours**

This unit covers structures and biochemical functions of vitamins along with biological role and significance of minerals.

- Definition and classification of vitamins
- Structure and biochemical role of fat soluble vitamins-A and D
- Structure and biochemical role of water soluble vitamins- Thiamine, Riboflavin, Niacin, Pyridoxine and Ascorbic acid.
- Biochemical role of inorganic elements – iron, calcium, phosphorous, iodine, selenium and zinc.

## **PRACTICAL (Credits 2; Hours 60)**

1. Qualitative tests for monosaccharides, disaccharides and polysaccharides.
2. Identification of monosaccharides, disaccharides and polysaccharides in unknown mixtures.
3. Quantitative estimation of glucose, sucrose and lactose by titrimetric method.
4. Qualitative tests for amino acids.
5. Estimation of calcium using EDTA by titration.
6. Estimation of ascorbic acid using 2,6 dichlorophenol indophenol method in the given solution.

### **Essential Readings:**

- Kennelly, P. J., Botham, K. M., McGuinness, O., Rodwell, V. W., Weil, P.A., 2022, *Harper's Illustrated biochemistry* (32nd ed.). McGraw-Hill Education.

- Nelson, D. L., Cox, M. M., 2017, *Lehninger Principles of Biochemistry* (7th ed.). W H Freeman & Co.
- Satyanarayana, U., Chakrapani U., 2021. *Biochemistry* (6th ed.). Elsevier.
- West, E.S., Todd, W.R., Mason, H.S., Bruggen J.T.V., 2017, *Textbook of Biochemistry* (4th ed.). Oxford & IBH.
- Sundararaj, P., Siddhu, A., 2002, *Qualitative tests and Quantitative Procedures in Biochemistry* (2nd ed.). New Delhi: A. H. Wheeler and Co Ltd.

**Suggested Readings:**

- Voet, D., Voet, J.G., 2012, *Principles of Biochemistry* (4th ed.). Wiley.
- Devlin, T.M. 2010, *Textbook of Biochemistry with Clinical Correlations* (7th ed.). New York, John Wiley-Liss.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time**



**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HP 5B2: Advanced Human 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		
Advanced Human Nutrition	4	2	0	2	XII Pass	Pass in Foundation of Food Science and Nutrition

**Learning Objectives**

- To understand the role of various nutrients, their requirements under normal and in special conditions with special reference to bioavailability.

**Learning Outcomes**

After completing this course, a student will be able to:

- Understand the importance of macro and micro-nutrients in a human body.
- Understand methods used for assessing nutrient requirements.
- Comprehend why and how the requirements change under special conditions.

**SYLLABUS OF DSE HP 5B2**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Human Nutritional Requirements**

**20 Hours**

- Historical perspective of nutrient requirements, terms used - EAR, RDA, AI, TUL
- Methods of assessment of nutrient needs – a critical review
- Biological role, sensitive methods of assessment, bioavailability, and other factors affecting requirements of nutrients
  - Energy
  - Carbohydrates and dietary fibre
  - Proteins and amino acids
  - Lipids and fatty acids
  - Water

- Fat soluble and water soluble vitamins
- Minerals

## **UNIT II: Nutrition under special conditions**

**10 Hours**

- Extreme temperatures - Hot and cold
- High altitude
- Space nutrition
- Nutrition in emergencies

### **PRACTICAL (Credits 2; Hours 60)**

1. Methods of assessment of protein quality - Chemical score, NDpCal%
2. Measuring energy expenditure - Minute to minute activity record, GPAQ
3. Understanding fatty acid profile of commonly eaten foods
4. Understanding the dietary fibre (soluble and insoluble) profile of commonly eaten foods
5. Assessment of molar ratios of iron and vitamin C in given diets
6. Estimation of iodine content of salt
7. Estimation of carotenoid content of fruits/vegetables
8. Estimation of antinutritional factors affecting bioavailability -phytic acid / oxalates / tannins
9. Understanding the clinical signs of nutrient deficiency and excess

#### **Essential Readings:**

- Chadha R., Mathur P. Eds. (2015) Nutrition: A Lifecycle Approach. New Delhi: Orient Blackswan.
- NIN-ICMR. (2020) Nutrient Requirements -Estimated Average Requirements and Recommended Dietary Allowances.
- WHO/UNHCR/UNICEF/WFP. (2004). Food and Nutrition Needs in Emergency.

#### **Suggested Readings:**

- FAO/WHO. (2004) Vitamin and Mineral Requirements in Human Nutrition. Report of a Joint Expert Consultation.
- FAO/WHO/UNU (2004) Human Energy Requirements. Report of a Joint Expert Consultation. Rome.
- FAO/WHO/UNU (2007) Protein and Amino acid Requirements in Human Nutrition. Report of a joint WHO/FAO/UNU expert consultation WHO Technical Report Series 935. Geneva: WHO.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time**

**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HP 5C1: Information and Communication Technologies for Change**

**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		
Information and Communication Technologies for Change	4	2	0	2	XII Pass	Appeared in Fundamentals of Communication

**Learning Objectives**

- To appraise the importance of ICTs and their incorporation in the development sector.
- To explain the integration of ICTs in the Development Communication.
- To provide skills for discerning and producing information using ICTs.
- To familiarize learners with the strategies for creating effective ICT materials and assess their impact.
- To enhance awareness about development initiatives at global level and address them using ICTs.

**Learning Outcomes**

- Assess relationship between ICT and Development.
- Gain knowledge about the effective use of ICTs in Development sector.
- Develop skills to conceptualize and create ICT tools for higher user engagement.
- Critique the role of ICTs for social change and maximize their reach and impact.
- Address the global development concerns by using ICTs effectively.

**SYLLABUS OF DSE HP 5C1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Introduction to ICTs**

**10 Hours**

This unit elucidates upon the concept of ICTs and their growth. It covers Digital Literacy and allied terms. It also delves upon learning theories and their implications for using ICTs

- Understanding ICTs- Definition, concept, meaning
- Evolution and Growth of ICTs-global and local level
- Classification of ICTs- Traditional and modern ICTs, their relevance to development

- Digital Literacy- meaning concept and changing notion
- Introduction to Digital Capital, Digital Divide, Digital Gender Divide
- Learning theories: behaviorism, cognitivism, constructivism, and connectivism and their implications for using ICT
- Limitations and challenges of ICTs
- ICT related development Indices

## **UNIT II: Types of ICT in Development**

**8 Hours**

This unit focuses on various media such as radio, television, mobile applications and new media as an ICT tool for development. It also includes economic management for ICT projects

- ICT mediated learning: engagement and correlation
- Radio as a tool for ICT
- Television as a tool for ICT
- Mobile as a tool for ICT
- New Media as tools for ICT
- Stakeholders in ICT projects, funding patterns and management

## **UNIT III: Application of ICTs in addressing Global Development Concerns**

**12 Hours**

This unit provides the students an in-depth view of various initiatives at national and international level, to address the global development challenges and the strategies to combat them

- Role of ICTs in Livelihood development and Poverty Reduction, Governance, Sustainable Education, sustainable agriculture; Environment protection & Climate change, Disaster Risk reduction
- Usage of ICTs in Gender equality and Empowerment, addressing health challenges through E-Health & M-Health initiatives
- Importance of Cyber Security- Scenario of Cyber Crime in India, Types of Cyber Crimes - Identity Theft, Psychological Tricks, Social Media Frauds, Mobile Application Frauds, Online Banking Frauds, Virus Attack on Personal Computers, etc.,
- Cyber Hygiene for Cyber Space & General Tips to keep you safe, National Cyber Crime Reporting Portal and Incident Reporting

### **PRACTICAL (Credits 2; Hours 60)**

1. Conducting a survey on ICTs and social media usage pattern
2. Review of Mobile Apps on Development Issues
3. Analyzing and reviewing various internet-based platforms for social change such as blogging, YouTube etc.
4. Review of websites for e-initiatives of Govt. of India
5. Research and development of a report/presentation related to Cyber security and Hygiene
6. Conceptualization, ideation and creation of ICT materials for a social media campaign

### **Essential Readings:**

- Heeks, R. (2018). *Information and Communication Technology for Development (ICT4D)*. Routledge Publications.

- Kiwelekar, A.W. (2021). *Information Communication Technologies for Sustainable Development: A Concise Textbook for ICT4SD*. Notion Press, Mangaon-Raigad 402104 India.
- Makol, R. & Makol. L. (2021). *Critical Understanding of ICT*. Kala Mandir, New Delhi.
- Mishra, RC. (2010). *Cyber Crime Impact in the New Millenium*, Auther Press.
- Unwin, P. T. H., & Unwin, T. (2017). *Reclaiming information and communication technologies for development*. Oxford University Press.

#### **Suggested Readings:**

- GoM. (2020). *Cyber Security Awareness Booklet for Citizens. Volume I*. Office of Special Inspector General of Police Maharashtra Cyber, Home Department. Government of Maharashtra. Last Accessed Date 20 March 2023.  
<https://cybercrime.gov.in/pdf/Cyber%20Security%20Awareness%20Booklet%20for%20Citizens.pdf>
- MoHA. (2021). *Cyber Hygiene for Cyber Space - Dos and Don'ts Basics*. Ministry of Home Affairs. Last Accessed Date 20 March 2023  
[https://cybercrime.gov.in/pdf/Final\\_English\\_Manual\\_Basic.pdf](https://cybercrime.gov.in/pdf/Final_English_Manual_Basic.pdf)
- Kihrwadkar A, Pushpanadan, (2006), *Information and Communication Technology in Education*, Sarup and Sons, Delhi. Chapter- 1,2,3
- Reddi, U. R. V. *Primer 1: An Introduction to ICT for Development*. UNAPCICT. Last Accessed Date 20 March 2023  
[https://www.unapcict.org/sites/default/files/inline-files/Primer%201\\_An%20Introduction%20to%20ICTD.pdf](https://www.unapcict.org/sites/default/files/inline-files/Primer%201_An%20Introduction%20to%20ICTD.pdf)
- Tongia, R., Subrahmanian, E. & Arunachalam, V. (2005). *Information and Communications Technology for Sustainable Development*. Bangalore: Allied Publishers
- Unwin, T. (Ed.) (2009). *ICT4D: Information and Communication Technology for Development*. Cambridge: Cambridge University Press.
- Weigel, G. & Waldburger, D. (Eds.) (2004). *ICT4D – Connecting People For A Better World. Lessons, Innovations and Perspectives of Information and Communication Technologies in Development*. Berne: Swiss Agency for Development and Cooperation (SDC) and the Global Knowledge Partnership (GKP).

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HP 5C2: Digital Marketing and Advertising**

**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		
Digital Marketing and Advertising	4	2	0	2	XII Pass	Appeared in Fundamentals of Communication

**Learning Objectives**

- To introduce the concept of marketing and digital marketing.
- To develop an understanding of the core elements of Digital Marketing.
- To introduce current practices and tools of Digital Marketing.
- To provide comprehensive understanding of the use of digital media, social media, and mobile applications for marketing applications.
- To familiarize students with the concepts and techniques of advertising.

**Learning Outcomes**

- Build basic Concepts of Digital marketing and the road map for successful Digital marketing strategies.
- Understand the fundamentals and best practices-audience engagement, content curation, campaign planning and execution, tools and resources, and measuring results for using social media for marketing on current, new and emerging platforms.
- Understand the concepts and skills required for advertising and the importance of effective brand positioning using integrated marketing communications.
- Learn to critically evaluate advertisements and understand the importance of ethical practices in advertising.
- Examine the scope for making advertising and digital marketing a future career

**SYLLABUS OF DSE HP 5C2**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Introduction to Digital Marketing****8 Hours**

This unit elucidates upon the concept of marketing and digital marketing. It will enable the learners to understand the core elements of Digital and critically appraise the integration of digital marketing into broader design and development strategies.

- Understanding concept of Marketing Process
- Understanding Concept of Digital Marketing Process
- Digital Marketing VS traditional marketing
- Benefits of Digital Marketing and various Digital Platforms
- Digital Marketing Landscape
- Understanding Digital Business Models
- Digital Marketing Strategy Concept of visibility, its type and visitors' engagement
- Introduction to Search Engines for Marketing Applications

**UNIT II: Introduction to Advertising****12 Hours**

The idea of the unit to explore the concept of advertising world to the students. Beside introducing the concept, the unit will further elaborate the models of advertising along with the classification of the same. The ethics regulating the field of advertising will also be covered.

- Understanding concept, importance and functions of Advertising
- Advertising Theories and Models-AIDA model, DAGMAR Model, Maslow's Hierarchy Model, communication theories applied to advertising
- Types of advertising and new trends
- Economic, cultural, psychological and social aspects of advertising
- Ethical & regulatory aspects of Advertising-Apex Bodies in Advertising-AAAI, ASCI and their codes
- Types of Media for advertising and their characteristics
- Marketing mix, role of advertising in the marketing mix
- Media selection, Planning, Scheduling for effective advertising

**UNIT III: Digital Marketing VS Advertising: Tools and Techniques****10 Hours**

This unit describes the tools and techniques used in digital marketing and advertising. Concepts of Search Engine Optimization, Search Engine Marketing and Search Media Marketing will be thought. The unit also will bring clarity upon Integrated Marketing Communication and executing Digital Strategy and Digital Marketing Analytics.

- Digital marketing: tools and techniques
- Advertising: tools and techniques
- Performance of Digital Advertising:- Process & players, Display Advertising Media, Digital metrics
- Understanding website planning process
- Search Engine Optimization and Search Engine Marketing
- Social Media marketing, Email marketing, Content marketing, Affiliate marketing
- Elements of Branding and Integrated Marketing Communication
- Crafting and Executing Digital Strategy and Digital marketing analytics

**PRACTICAL**  
**(Credits 2; Hours 60)**

1. Design an ad copy for a product
2. Developing advertisements for media
3. Planning & Designing advertising campaigns
4. Critical evaluation of Digital Media Marketing campaigns
5. Designing and implementation of Digital Media Campaigns
6. Analysis of websites and development of web pages, blogs and vlogs
7. Creating effective Ad Words campaign & Advertising Positioning with respect to the Digital marketing

**Essential Readings:**

- Broom, G.M. (2012). *Cutlip and Center's Effective Public Relations*. Pearson Prentice Hall.
- Chunawalla S.A. (2018). *Advertising Theory and Practice*. Himalaya Publishing House.
- Deiss, R., Henneberry, R. (2017). *Digital Marketing for Dummies*. For Dummies.
- Jethwaney, J., Jain, S. (2012). *Advertising Management*. Oxford University Press India.
- Jefkins, F. (1994). *Public Relation Techniques*. A Butterworth-Heinemann Title.
- Kingsnorth, S. (2019). *Digital Marketing Strategy: An Integrated Approach to Online Marketing*, Kogan Page.
- Rowles, D. (2014). *Digital Branding: A complete step-by-step guide to strategy, tactics and measurement*. Kogan Page.

**Suggested Readings:**

- George, B.E., Michael, B.A., Keyoor, P. (2007) *Advertising & Promotion, an Integrated Marketing Communications Perspective*. McGraw Hill.
- Heath R.L. (2010). *The Sage Handbook of Public Relations*. SAGE Publications, Inc.
- Hinton, S and Larissa, H. (2013). *Understanding Social Media*. Sage Publications India.
- Jefkins, F. (1985). *Advertising Made Simple*. Made Simple.
- Kaul J.M. (1982). *Public Relation in India*. Noya Prakash.
- Lister, M, Dovey, J. (2003). *New Media: A Critical Introduction*. Routledge.
- Ogilvy, D. (1995) *Ogilvy on Advertising*. Prion Books.
- Wilcox D.L., Glen T, Reber, B. (2014). *Public Relations: Strategies and Tactics*. Pearson

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HP 5D1: Pattern Making and Construction for Women's Wear**

**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		
Pattern Making and Construction for Women's Wear	4	2	0	2	XII Pass	Appeared in Fashion Concepts

**Learning Objectives**

- To trace the development of fashion industry.
- To gain an understanding and knowledge of the market involved in women's wear.
- To develop skills in designing, pattern making and construction of advanced styles in garment making techniques for women's wear.

**Learning Outcomes**

- Comprehend the evolution of fashion industry.
- Describe the design development process involved in women's wear fashion.
- Understand the market involved in women's wear
- Judicious application of knowledge with respect to selection of fashion fabrics, support materials and trims
- Develop popular garment styles for upper and lower garments for women

**SYLLABUS OF DSE HP 5D1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Women's Wear Fashion**

**6 Hours**

This unit enables the students to understand the growth and development of fashion industry with respect to Haute couture and ready to wear apparel for women.

- Development of fashion industry at international level- growth of the Haute Couture, effects of Industrial Revolution, mass production of clothing, women in work force leading to new fashion trends

- International fashion centres
- Designing for women's wear- Fashion seasons, line planning, sources of fashion inspiration, concept board, fabric and colour story, design sketches

## **UNIT II: Women's Wear Market**

**6 Hours**

This unit provides an insight into the women's wear market with respect to various brands, market categories, sizes, styles and silhouettes. It further imparts knowledge on selection and sourcing of raw materials for women's wear.

- National and International brands for Women Wear
- Women's wear: categories, sizes, styles and silhouettes
- Selection and sourcing of fashion fabrics, support materials and trims

## **UNIT III: Drafting and Pattern Making**

**18 Hours**

This unit imparts skills in designing and pattern making of various styles in women's wear including upper and lower Indian and western garments and dresses without waistline seams.

- Design variation in bodice through dart manipulation and added fullness
- Design variation in skirts by adding pleats, flares, yokes, panels, circularity
- Drafting of Indian upper and lower garments: Straight & A-line kurta, Salwar/Churidar/Palazzos
- Torso foundation: Boxy, Semi-fitted and Fitted
- Styles of dresses without waistline: Princess-line, Panel dress, Empire-line and Tent silhouette
- Stylizing various components of a garment- sleeves, collars, plackets, pockets, vents & slits, peplum, godets

## **PRACTICAL (Credits 2; Hours 60)**

## **UNIT I: Designing and Pattern making for Women's Wear**

**32 Hours**

This unit provides hands-on skill to the students for adapting the basic slopers to create style variations in women's wear.

- Designing five women's tops/blouses using the principles of dart manipulation and added fullness and developing patterns for any two selected designs.
- Designing five women's skirts by adding pleats, flares, yokes, panels, circularity and developing patterns for any two selected designs.
- Designing one Kurta and one dress without waistline seam and developing the pattern for the same

## **UNIT II: Construction of women's garments**

**28 Hours**

This unit equips the student to select appropriate fabric, plan a layout of pattern pieces, cut the fabric and assemble the cut pieces using basic seams and processes to create a finished garment.

- Construction of either a top / blouse or a skirt using the patterns developed in unit 1
- Construction of a Kurta / dress without waistline seam using the pattern developed in unit 1

**Essential Readings:**

- Brown, P. and Rice, J. (2014) Ready to Wear Apparel Analysis, Fourth Edition. Pearson Education, India
- Armstrong, H.J., 2009, *Pattern Making for Fashion Design*, Harper Collins Publishers Inc., New York.
- Aldrich, W. (2008) Metric Pattern Cutting for Women's Wear, ISBN 10: 1405175672 / ISBN 13: 9781405175678, Wiley Blackwell Publication.
- Frings, G.S. (2007) FASHION From concept to consumer 9th ed., ISBN—10:0131590332/ ISBN-13: 978-0131590335, Pearson education Inc.
- Shoben, M.M., Ward, J.P. (2000) Pattern Cutting and Making Up Volume 2, Revised Edition, LCFS Fashion Media

**Suggestive Readings:**

- Dunham, G. R., (2021) The Fitting Book: Make Sewing Pattern Alterations and Achieve the Perfect Fit You Desire, Gina Renee Designs, India
- Jennifer Lynne & Matthews-Fairbanks, 2018, *Pattern Design: Fundamentals*, Fairbanks Publishing LLC.
- Reader's Digest (Eds.). 2002, New Complete Guide to Sewing, Reader's Digest Association (Canada) Ltd. Montreal.

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HP 5D2: Designing for Children's Wear**

**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		
Designing for Children's Wear	4	2	0	2	XII Pass	Appeared in Fashion Concepts

**Learning Objectives**

- To gain an understanding and knowledge of the market involved in children's wear.
- To develop proficiency in design conceptualization of clothes for children.
- To develop skills in designing, pattern making and construction of styles in garment making techniques for children's wear.

**Learning Outcomes**

- Describe the design development process involved in children's wear fashion.
- Understand the market involved in children's wear.
- Judicious application of knowledge with respect to selection of fashion fabrics, support materials and trims
- Develop popular garment styles of garments for children.

**SYLLABUS OF DSE HP 5D2**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Children's Wear Market**

**6 Hours**

This unit enables the students to gain an insight into the children's wear market with respect to market categories, sizes, various brands, fashion seasons and sources of design inspiration.

- Categories of children's wear
- Sizes in children's wear
- National and international brands
- Fashion seasons
- Design inspiration

**UNIT II: Design Conceptualization**

**6 Hours**

This unit imparts knowledge on planning a line for children's wear, selection and sourcing of raw materials and designing appropriate clothing for different children age groups.

- Planning a line- concept board, design sketches, colour and fabric story
- Selection and sourcing of suitable fabrics, support materials and trims
- Designing for different age groups (Infants, toddlers, pre-schooler, elementary school going, pre-teens and teens): Boys and girls
- Structural and applied design in children's wear

### **UNIT III: Pattern development for children's wear**

**18 Hours**

This unit imparts skills in designing and pattern making of various styles in children's wear including upper and lower garments for boys and girls.

- Child's bodice sloper, sleeve sloper, shorts sloper
- Fullness – Addition and disposal of fullness: dart, gathers, pleats and flares
- Adaptation of child's bodice to the following:
  - Skirt top
  - Skirts (Flared, gathered, A-line, pleated)
  - Frocks (A-line, yoked, short bodice, elongated bodice with gathers, pleats and flare)
  - Bushirt
  - Romper/ Pedal Pusher/ Jumpsuit
- Adaptation of child's sleeve:
  - Flared sleeve
  - Cap sleeve
  - Petal sleeve
  - Puffed sleeve and its variations
- Drafting collars:
  - Mandarin Collar
  - One piece stand and fall collar
  - Peter pan collar (flat and raised) and its variations (sailor's, cape, bertha)
- Other garment components- pockets, plackets and fasteners

### **PRACTICAL (Credits 2; Hours 60)**

#### **Learning Objective**

It will develop a keen eye for design and development of patterns for styles in children's fashion wear.

#### **Learning Outcomes**

- Able to develop basic slopers and adapt these to various design drafts
- Construct any one selected garment
- Design a line for children's wear
- Show case their work as a class/ team effort

**UNIT I: Designing and pattern making for children's wear****32 Hours**

This unit provides hands-on skill to the students for adapting the basic slopers to create style variations in children's wear.

- Developing child's slopers- bodice, sleeve and shorts
- Adaptation of bodice block to shirt/bushirt, A-line frock, short bodice, elongated bodice regular bodice, yoke with flare, pleated and gathered frock
- Sleeve adaptations
- Collar drafts

**UNIT II: Construction of children's garment and designing a line****28 Hours**

This unit equips the student to select appropriate fabric, plan a layout of pattern pieces, cut the fabric and assemble the cut pieces using basic seams and processes to create a finished garment.

- Construction of a garment from the adaptations above
- Designing a line for children's wear by adding design interest to the above patterns and developing patterns for the same (boys and girls)

**Essential Readings:**

- [Donnanno](#) A., 2018, Fashion Patternmaking Techniques for Children's Clothing, Promopress
- Brown, P. and Rice, J., 2014, Ready to Wear Apparel Analysis, Fourth Edition. Pearson Education, India
- Marshall S G, Jackson H O, Stanley MS, Kefgen M & Specht T, 2011, Individuality in Clothing Selection and Personal Appearance, 7<sup>th</sup> edition, Pearson Education, USA
- Armstrong, H.J., 2009, *Pattern Making for Fashion Design*, 5<sup>th</sup> ed., Harper Collins Publishers Inc., New York
- Frings, G.S., 2007, FASHION From concept to consumer, 9th ed., ISBN—10:0131590332/ ISBN-13: 978-0131590335, Pearson education Inc.

**Suggestive Readings:**

- Jennifer Lynne & Matthews-Fairbanks, 2018, *Pattern Design: Fundamentals*, Fairbanks Publishing LLC
- Reader's Digest (Eds.). 2002, New Complete Guide to Sewing, Reader's Digest Association (Canada) Ltd. Montreal

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HP 5E1: Entrepreneurship and Enterprise Management**

**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		
Entrepreneurship and Enterprise Management	4	2	0	2	XII Pass	Appeared in Introduction to Resource Management

**Learning Objectives**

- To familiarize the students with meaning and concept of entrepreneurship and its ecosystem.
- To sensitize and orient students towards identifying entrepreneurial opportunities and market potential.
- To impart knowledge for setting up an enterprise and its management

**Learning Outcomes**

Students will be able to :

- Understand the concepts of an entrepreneur, entrepreneurship and entrepreneurial ecosystem in context of India.
- Appreciate the role of entrepreneurial motivation and creativity in innovation.
- Develop skills in project identification, formulation and appraisal.
- Gain insight into setting up of an enterprise and its management.

**SYLLABUS OF DSE HP 5E1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Entrepreneurship Development:** Fundamental concepts of entrepreneurship development and entrepreneurial ecosystem. **10 Hours**

- Entrepreneurship- concept, significance, stages, growth process, entrepreneurship development in India, entrepreneurship education model, drivers & barriers
- Entrepreneur- characteristics, competencies, types, style & motivation

- Women Entrepreneurship in India- characteristics, competencies, significance, status, factors promoting , challenges faced, strategies for women entrepreneurship development- income generation , self-help groups, micro enterprises and self- employment, skill development and technology transfer
- Entrepreneurial Ecosystem: Domains (accessible markets, availability of finance, conducive culture, human capital, progressive policy framework, and a range of institutional support)
- Creativity: Concept, significance & process
- Innovation: Concept, types, process, sustaining growth- disruptive innovation.

**UNIT II: Enterprise Planning and Launching:** Project identification, project formulation, project appraisal **10 Hours**

- Types of enterprises: classification based on sector, capital, gender, place, product, ownership pattern, platform & process
- Project Identification: sensing business opportunities, feasibility study
- Project Formulation: Project report & its components, writing a business proposal
- Project Appraisal: Technical, marketing, financial, legal and environmental

**UNIT III: Enterprise Management & Sustenance** (with reference to start ups and micro enterprises) **10 Hours**

- Production Management - Organizing production; input-output cycle - ensuring quality
- Marketing Management- Understanding markets and marketing: types, functions & marketing mix
- Financial Management - Concept, types and sources of finance, financial ratios & projections
- Human resource management – Concept, significance, practices, challenges
- Total Quality Management
- Business ethics

**PRACTICAL**  
**(Credits 2; Hours 60)**

1. Micro Lab
2. SWOC analysis of successful entrepreneurs and enterprises through case profiling.
3. Entrepreneurial Competencies & Motivation - Simulations & experiential learning. Institutions facilitating entrepreneurship development in India.
4. Preparation and appraisal of a business plan.
5. Calculations of financial Indices.
6. Design and development of marketing mix for a startup.
7. Designing of sales campaign for digital marketing

**Essential Readings:**

- Barringer R. B. (2020). *Entrepreneurship: Successfully Launching New Ventures*. Pearson Education.
- Chhabra T. N. (2015). *Entrepreneurship Development*. Sun India.



- Charantimath, P. M. (2018). *Entrepreneurship Development and Small Business Enterprises*. Pearson Publications.
- Desai V. (2011). *The Dynamics of Entrepreneurial Development and Management*. Himalaya Publishing House.

**Suggested Readings:**

- Gundry L, K. & Kickul J. R. (2007). *Entrepreneurship Strategy: Changing Patterns in New Venture Creation, Growth, and Reinvention*. SAGE Publications, Inc.
- Taneja & Gupta. (2001). *Entrepreneur Development- New Venture Creation*. Galgotia Publishing Company.
- Zaware, N. (2019). *Entrepreneurship Development and Startups Management*. Educreation Publishing.

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HP 5E2: Innovation and Design Thinking**

**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		
Innovation and Design Thinking	4	2	0	2	XII Pass	Appeared in Introduction to Resource Management

**Learning Objectives**

- To comprehend the Design Thinking concept for fostering innovation
- To understand concept and role of innovation in present day context
- To apply design thinking solutions individually and in team for maximizing business growth
- To instill a culture of design thinking to enhance innovation within an organization

**Learning Outcomes**

- Students will be able to :
- Overcome cognitive fixedness and develop new mindset that integrates design thinking for innovation.
- Empathize and apply human centred design for seeking innovative solutions.
- Create the optimal environment and team dynamics to steer innovation and collaboration.
- Develop the capacity to design and test cutting-edge for customer-focused prototypes

**SYLLABUS OF DSE HP 5E1**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Innovation**

**10 Hours**

This unit will help students to understand the concept of innovation and types and its dimensions

- Innovation: Concept, significance, types and process
- Innovation diffusion theory
- Innovation in organizations : Drivers and barriers, bottom up and top down approach, horizontal versus vertical approach

- Dimensions of innovation: Innovation eco-system in India, social Innovation, grassroots innovation, frugal innovation and global Innovation-global innovation index framework (GII)

## **UNIT II: Design thinking approaches and processes**

**12 Hours**

The focus of this unit would be on developing the basic concepts of design thinking, business use of design thinking, mindset, approaches and processes.

- Design thinking : Concept, discipline, role and mindset
- Design Thinking Approaches: Empathy, Ethnography, Divergent thinking, convergent thinking, Visual thinking, Assumption testing, Prototyping and Time for learning and validation
- Design thinking resources: people, place, materials and organizational fit
- Design thinking processes: Double diamond process, Stanford d. school 5 stage process

## **UNIT III: Design thinking in practice**

**8 Hours**

This unit will help students to gain insights about design thinking tools, methods and its application.

- Stages of designing for growth
- Design thinking tools and methods: visualization, journey mapping, value chain analysis, mind mapping, brain storming, concept development, assumption testing, customer co creation, rapid prototyping, launching
- Design thinking applications in organizations

### **PRACTICAL (Credits 2; Hours 60)**

1. The foundation for innovation: Define users' needs and problems, identify and reframe the most game changing part of the problem and analyze the contextual environment for viable solution.
2. Ideate: Develop user focus ideas to identify new problems, and apply tools for innovative solutions, ideation through design thinking approaches and refine innovative ideas.
3. Develop an experimentation mindset: Combine ideas into complex innovation concepts, critique and strengthen concepts, guide prototyping by creating critical questions related to concept's desirability, feasibility and viability.
4. Implement : Assess developer and user perspectives for bias that may affect implementation, apply framework to strengthen communications about an innovation's value and reflect on management skills for sustaining a culture of innovation

### **Essential Readings:**

- Brown, T. (2009). *Change by design*. Harper Business.
- Drucker, P. F. (2006). *Innovation and entrepreneurship: Practice and principles*. USA: Elsevier.70
- Kahneman, D. (2011). *Thinking fast and slow*. Farrar, Straus and Giroux.
- Roy, R. (2008). *Entrepreneurship*. Oxford University Press.
- Soni, P. (2020). *Design your thinking: The Mindsets, toolsets and skillsets for creative*

*problem solving*. Penguin Random House India Private Limited.

**Suggested Readings:**

- Chesbrough, H. (2006). *Open business model: How to thrive in the new innovation landscape*. Harvard Business School Press.
- CN Prasad,(2004) *Small and Medium Enterprises in Global Perspective*. New century Publications.
- Fagerberg, J., Mowery, D. C., & Nelson, R. R. (Ed.). (2006). *The Oxford Handbook of innovation*. Oxford University Press.
- Kaplan, J. M. (.2006). *Patterns of entrepreneurship*. John Wiley & Sons.

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**DEPARTMENT OF HOME SCIENCE**  
**SEMESTER – VI**

**B.Sc. (Prog.) Home Science**

**DISCIPLINE SPECIFIC CORE COURSE**  
**DSC HP 616: Lifespan Development III: Development in Adulthood**

**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		
<b>Lifespan Development III: Development in Adulthood</b>	<b>4</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>XII Pass</b>	<b>Appeared in Lifespan Development II: Middle Childhood and Adolescence</b>

**Course description:**

Life span development, will equip aspiring students with theoretical perspectives and the, principles of development as well as the challenges during different stages of adulthood.

**Learning Objectives**

- To learn about the various changes that take place in the different domains of development during early, middle and late adulthood.
- To understand the theoretical perspectives on early, middle and late adulthood.
- To understand the influence of cultural contexts on development during adulthood.
- To learn about different techniques, tools of data collection and psychometric measurement.

**Learning Outcomes**

The students would be able to:

- The students will develop an understanding of the diverse changes that are experienced in different developmental domains during adulthood.
- Students will be able to apply theoretical perspectives in understanding adulthood.
- Students will be able to apply their understanding of development during adulthood to everyday life experiences.

- To understand how relationships evolve and are maintained through the lifespan.

## **SYLLABUS OF DSC HP 616**

### **THEORY (Credits 3; Hours 45)**

#### **UNIT I: Early Adulthood**

**20 Hours**

Unit description: This unit will explain the stage of early adulthood and the various changes across different domains of development.

Subtopics:

- Transition from adolescence to adulthood; Developmental tasks of adulthood
- Theoretical Perspectives of early adulthood- Life cycle approach, Erikson, Sternberg and others.
- Physical and physiological changes
- Socio-emotional development: Relationships, Marriage, co-habitation and Parenting
- Cognition and creativity: Work, Vocation and leisure

#### **UNIT II: Middle Adulthood**

**10 Hours**

Unit description: This unit will explain the stage of middle adulthood and focus on the physical, physiological and socio-emotional changes specific to this stage

Subtopics:

- Developmental tasks of middle adulthood
- Physical and physiological changes
- Socio-emotional development
- Diversity in roles and relationships
- Parenting in the current context

#### **UNIT III: Late Adulthood**

**15 hours**

Unit description: This unit will explain the stage of late adulthood and the challenges across the different domains of development.

Subtopics:

- Developmental tasks of late adulthood
- Physical and physiological changes and aging
- Socio-emotional development: Parenting and Grandparenting; Coping with the challenges of aging
- Work and Retirement
- Cultural Perspectives on aging, death and grief
- Meditation, spirituality and stress management

### **PRACTICAL (Credit 1; Hours 30)**

#### **UNIT 1**

**15 Hours**

- Reviewing methods of data collection: Interview, Observation, Questionnaire, Case study
- To study physical and sexual changes in adulthood
- To study cognitive development and creativity during adulthood
- Case profile of an adult- including study of self, family relationships and peer relationships, challenges.
- Use of interview/questionnaire method to study adult roles (at least one male and

- female)
- Father/husband
- Home maker
- Employed woman
- Grandfather/Grandmother
- Single parent
- College-going young adults

## **UNIT 2**

**15 Hours**

- Depictions of adolescence and adulthood stages in media: Audio-visual, Print and Theatre
- Familiarity with Psychological Tests of Intelligence and Personality- any three (WAIS-R, Ravens, TAT)
- Analysis of care-based apps for elderly

### **Essential Readings:**

- Berk, L. E. (2007). Development through the Lifespan. Delhi, Pearson Education
- Papalia, D.E. and Martorell, G. (2015). Experience Human Development, McGraw-Hill Education
- Rice, F. P. (1998). Human Development: A lifespan approach. New Jersey: Prentice Hall.
- Santrock, J. W. (2007). A topical approach to life-span development. New Delhi: Tata McGraw- Hill.
- Santrock, J.W (2021). Life Span Development: Eighteenth edition. MC.Graw-Hill: New York.
- Singh, A. (Ed). (2015). Foundations of Human Development: A Life Span Approach. New Delhi: Orient Black Swan

### **Suggested Readings:**

- Harris, M. and Butterworth, G. (2002). Developmental Psychology: A Student's Handbook. Psychology Press.
- Hurlock, E. B. (1973). Adolescent Development. Mc Graw -Hill Education.
- Journal of Developmental Psychology
- Lefrancois, G.R. (1996). The Lifespan. Wadsworth Publishing Company.
- Rutter, M. and Rutter, M. (1992). Developing Minds. Challenge and continuity across the Life span. London: Penguin.
- Tennant, M. and Pogson, P. (1995) Learning and Change in the Adult Year, San Francisco: Jossey-Bass

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time**

**DISCIPLINE SPECIFIC CORE COURSE**  
**DSC HP 617: Public Nutrition and Dietetics**

**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		
<b>Public Nutrition and Dietetics</b>	<b>4</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>XII Pass</b>	<b>Appeared in Lifespan Approach to Nutrition</b>

**Learning Objectives**

- To elucidate the concept and scope of public nutrition.
- To apprise the relevance of assessing nutritional status and the various techniques for assessment of nutritional status.
- To familiarize with the common nutritional deficiencies of public health significance and their management and prevention.
- To understand the nutrition care process in disease management of a patient.
- To develop the skill of modifying normal diets into therapeutic diets for managing some diseases/ disorders.
- To understand the etiology, patho-physiology, metabolic changes, clinical symptoms and management of some common disorders / diseases.

**Learning Outcomes**

- Understand the concept of public nutrition and the multifaceted nature of nutritional problems.
- Comprehend the relevance of assessing nutritional status and various techniques for assessment of nutritional status.
- Knowledge of common nutritional deficiencies, their management, prevention and relevant national nutrition programmes.
- Understand the principle of diet therapy and the nutrition care process.
- Develop an ability to modify a normal diet for therapeutic purposes.
- An understanding of the etiology, patho-physiology, metabolic changes, clinical symptoms and management of some common disorders / diseases.

**SYLLABUS OF DSC HP 617**

**THEORY**  
**(Credits 3; Hours 45)**

**UNIT I: Concept and scope of public nutrition**

**3 Hours**

- Health –Concept, definition, dimensions, determinants and indicators
- Definition and multidisciplinary nature of public nutrition
- Concept, scope and current concerns in public nutrition
- Role of public health nutritionist



**UNIT II: Assessment of nutritional status of individual and community 8 Hours**

- Objectives and importance of assessment of nutritional status of individual and population groups
- Methods of Assessment of Nutritional status of Individual and Population groups
  - Anthropometry and related measures
  - Biochemical Assessment
  - Clinical Examination
  - Dietary Assessment
  - Vital Statistics , Ecological factors

**UNIT III: Prevalence, etiology, clinical features, prevention and management at community level of the following. 10 Hours**

- Protein Energy Malnutrition, Moderate Acute Malnutrition, Severe Acute Malnutrition
- Micronutrient deficiencies such as Vitamin A deficiency, Nutritional anemia, Iodine deficiency disorders, Vitamin D deficiency and Zinc deficiency
- Fluorosis
- Obesity, Metabolic Syndrome and Non communicable disease- An overview

**UNIT IV: Introduction to Nutrition Care and Diet Therapy 4 Hours**

- Principles and basic concepts of diet therapy
- Nutrition Care Process (NCP)
- Therapeutic modifications of the normal diet

**UNIT V: Etiology, patho-physiology, metabolic changes, clinical symptoms and management of some common disorders / diseases 20 Hours**

- Febrile disorders- Typhoid, Tuberculosis, HIV-AIDS
- GI Tract disorders- Diarrhoea, Constipation, Lactose Intolerance, Celiac Disease
- Weight management- Underweight, Overweight and Obesity

**PRACTICAL  
(Credit 1; Hours 30)**

**I Assessment of nutritional status:**

- Anthropometry (height, weight , Middle upper arm circumference, Waist circumference )
- Dietary Assessment - Food frequency questionnaire ,24 hour dietary recall
- Review of nutritional status of population from National /Regional/ Nutrition Surveys (NFHS, CNNS, etc)

**II Planning and preparation of low cost nutritious diet/recipes for:**

- Population groups vulnerable to nutritional deficiency diseases (Protein Energy Malnutrition,, Nutritional Anemia, Vitamin A deficiency)

**III Planning and preparation of diets/dishes and snacks for:**

- Individuals suffering from febrile disorders- Typhoid, Tuberculosis; GI Tract disorders- Diarrhea and Constipation; Weight management- Underweight, Overweight/ obesity

**Essential Readings:**

- Vir, S. (2023). Child, adolescent and women nutrition in India: Public Policies, programme and progress. KW Publishers, Daryaganj, New Delhi, India.

- Park, K. (2021). Park's Textbook of Preventive and Social Medicine (26th ed.). Jabalpur, India: Banarasisdas Bhanot Publishers.
- Seth, V. and Singh K. (eds.) (2021) Principles of Medical Nutrition Therapy for Positive Clinical Outcomes, 1<sup>st</sup> Edition. Elite Publishing House Pvt. Ltd.
- ICMR (2020) Estimated Average Requirements and Recommended Dietary Allowances for Indians .Published by National Institute of Nutrition, Hyderabad.
- Seth V, Singh K and Mathur P (2018). Diet Planning through the Life Cycle: Part 1 Normal Nutrition. A Practical Manual. 6<sup>th</sup> Edn. Elite Publishing House Pvt. Ltd. New Delhi.
- Siddhu A, Bhatia N, Singh K, Gupta S (2017). Compilation of food exchange list, technical series 6, Lady Irwin College, University of Delhi. Publ. Global Books Organisation, Delhi
- Longvah T, Ananthan R, Bhaskarachary K and Venkaiah K (2017). Indian Food Composition Tables. National Institute of Nutrition, ICMR, Hyderabad.
- Kishore, J. (2016). National Health Programs of India (12th ed.). New Delhi, India: Century Publications.
- Wadhwa A and Sharma S (2003). Nutrition in the Community- A Textbook. Elite Publishing Pvt Ltd, New Delhi.
- Jelliffe DB & Jelliffe E F P (1989). Community nutritional assessment with special reference to less technically developed countries. Oxford Medical Publications. Oxford University Press, Oxford, UK.
- Policy on Control of Nutritional Anemia (1991). Ministry of family and health welfare. Government of India.

### **Suggested Readings:**

- Chadha R and Mathur P eds.(2015) Nutrition : A Lifecycle Approach. Orient Blackswan, New Delhi.
- Indian Dietetics Association, (2018) Clinical Dietetics Manual, 2nd Edition. Elite Publishing House Pvt. Ltd.
- Bamji, M. S., Krishnaswamy, K. & Brahman, G. N. V. (Eds.). (2017). Textbook of Human Nutrition (4th ed.). New Delhi, India: Oxford and IBH Publishing Co. Pvt. Ltd.
- Gibney, M. J., Margetts, B. M., Kearney, J. M. & Arab, L. (Eds.). (2005). Public Health Nutrition. Oxford, UK: Blackwell Science.
- ICMR (2011) Dietary Guidelines for Indians. Published by National Institute of Nutrition, Hyderabad.
- Khanna K, Gupta S, Seth R, Passi SJ, Seth R, Mahna R, Puri S (2013). Textbook of Nutrition and Dietetics. 2nd Edn. Phoenix Publishing House Pvt. Ltd.
- <https://www.who.int/tools/child-growth-standards/standards>. Assessed on March 2023
- National Nutrition Monitoring Bureau (India) | GHDx ([healthdata.org](http://healthdata.org)) Assessed on March 2023
- WHO. Xerophthalmia and night blindness for the assessment of clinical vitamin A deficiency in individuals and populations. WHO/NMH/NHD/EPG/14.4. Geneva: World Health Organization; 2014 ([http://apps.who.int/iris/bitstream/10665/133705/1/WHO\\_NMH\\_NHD\\_EPG\\_14.4\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/133705/1/WHO_NMH_NHD_EPG_14.4_eng.pdf)). Assessed on March 2023
- <https://www.who.int/data/nutrition/nlis/info/vitamin-a-deficiency> Assessed on March 2023
- [https://www.nhm.gov.in/images/pdf/programmes/child-health/IEC-materials/PARTICIPANT-MANUAL\\_FBCSA-Malnutrition.pdf](https://www.nhm.gov.in/images/pdf/programmes/child-health/IEC-materials/PARTICIPANT-MANUAL_FBCSA-Malnutrition.pdf) Assessed on March 2023
- Comprehensive National Nutrition Survey(2016-18) reports <https://www.unicef.org/india/media/2646/file/CNNS-report.pdf> Assessed on March 2023

- WHO <https://www.who.int/tools/child-growth-standards/standards>. Assessed on March 2023
- WHO (2009) <https://www.who.int/publications/i/item/9789241547635>. Assessed on March 2023
- NRHM. Facility based care of SAM (2013) [https://www.nhm.gov.in/images/pdf/programmes/child-health/IEC-materials/PARTICIPANT-MANUAL\\_FBCSA-Malnutrition.pdf](https://www.nhm.gov.in/images/pdf/programmes/child-health/IEC-materials/PARTICIPANT-MANUAL_FBCSA-Malnutrition.pdf) .Assessed on March 2023
- NFHS Project | International Institute for Population Sciences (IIPS) ([iipsindia.ac.in](http://iipsindia.ac.in))Assessed on March 2023

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**DISCIPLINE SPECIFIC CORE COURSE**  
**DSC HP 618: Sociology and Psychology for 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/ Practice		
<b>Sociology and Psychology for Home Science</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>XII Pass</b>	<b>NIL</b>

**Learning Objectives**

- To develop an understanding of the contributions of Sociology and Psychology to Home Science.
- To gain knowledge about various dimensions of social change, society and culture.
- To develop an understanding of the nature and foundations of Psychology.
- To appreciate the relevance of the Sociology and Psychology in everyday life.

**Learning Outcomes**

Students will be able to:

- Understand the nature of self, family, community and society.
- Gain awareness of the variations in family and social systems.
- Develop an understanding of Psychology and its basic concepts.
- Apply concepts of Sociology and Psychology in everyday life.

**SYLLABUS OF DSC HP 618**

**THEORY**  
**(Credits 2; Hours 30)**

**PART A – Sociology (15 Hours)**

**UNIT I: Introduction to Sociology**

**7 Hours**

This unit will introduce the students to basic concepts of social systems.

- Definitions and theoretical approaches in Sociology
- Social systems: Family, Community and Society
- Family in India: Structures, functions, variations and transition

**UNIT II: Communities and Social Groups**

**8 Hours**

This unit introduces the students to the concepts of communities, social groups and social inclusion and exclusion.

- Types of communities: rural, urban, tribal, and other variations

- Organization and role of social groups in communities and society
- Social Inclusion and Exclusion

## **PART B – Psychology (15 Hours)**

### **UNIT III: Introduction to Psychology**

**8 Hours**

This unit will help students to gain an insight into the basic concepts of Psychology.

- Key terms, definitions and concepts in Psychology
- Schools of thought in Psychology
- Theories of learning and perception

### **UNIT IV: Psychology in everyday life**

**7 Hours**

This unit will help students to appreciate the application of Psychology in everyday life.

- Self, emotions, perception and behaviour
- Group dynamics
- Media and Psychology

## **PRACTICAL (Credit 2; Hours 60)**

### **PART A – Sociology**

**30 Hours**

1. To study the structures and roles of families in diverse settings (social, cultural, economic and geographical variations)
2. To study local communities to understand social systems and dynamics (residential, slum, street, migrant).
3. Documenting everyday rituals, cultural practices and events: traditional art and craft, folk songs, attire, food
4. Audio visual resources to study changing social systems

### **PART B – Psychology**

**30 Hours**

1. To prepare a scrapbook on relevant contemporary topics and issues in Psychology
2. Audio visual material to understand how human behaviour influences group dynamics and relationships
3. Survey on use and impact of popular social media
4. Workshops on any relevant theme: self, emotional regulation, mindfulness, counselling.

### **Essential Readings:**

- Abraham, F. (2006). *Contemporary Sociology: An Introduction to concepts and Theories*. Oxford University Press.
- Anand, V., Balakrishnan, G., & George, P. (2018). *Community practices in India: Lessons from the grassroots*. Cambridge Scholars Publishing.
- Baron, R. A., Byrne, D., & Branscombe, N. R. (2006). *Social psychology* (11th ed.). Pearson Education.
- Beteille, Andre. (2009). *Sociology: Essays in Approach and Method*. Delhi: Oxford University Press.
- Ciccarelli, Sandra K., White, J. Noland & Misra, Girishwar. (2022). *Psychology* (6th ed.). Pearson India.
- Maguire, K. (2012). *Stress and coping in Families*. Wiley.
- Sachdeva, P., & Florence. D. (2020). *Basic Sociology*. Elite Publishing House.
- Shah, M. A. (2014). *The Writings of A. M. Shah: The Household and Family in India*.

**Suggested Readings:**

- Compas, B. E., Murphy, L. K., Yarboi, J., Gruhn, M. A., & Watson, K. H. (2019). Stress and coping in families. In B. H. Fiese, M. Celano, K. Deater-Deckard, E. N. Jouriles, & M. A. Whisman (Eds.), *APA handbook of contemporary family psychology: Foundations, methods, and contemporary issues across the lifespan* (pp. 37–55). American Psychological Association. <https://doi.org/10.1037/0000099-003>.
- Hochschild, A. (2013). *So how's the Family? And other Essays*. University of California Press.
- Madan, T. N. & Das, Veena. (2003). *The Oxford India companion to sociology and social anthropology*. Oxford University Press
- Passer, M.W. & Smith, R.E. (2010). *Psychology: The science of mind and behaviour*. Tata McGraw-Hill.

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**DISCIPLINE SPECIFIC ELECTIVE**  
**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/ 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 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; 30 Hours)**



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* 4<sup>th</sup> 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* 1<sup>st</sup> Ed. New Age International Pvt Ltd, New Delhi.
- Kumar, R. (2019) *Research Methodology: A Step-by-Step Guide for Beginners*. 5<sup>th</sup> 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](https://www.ugc.ac.in/e-book/Academic%20and%20Research%20Book_WEB.pdf)

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**DISCIPLINE SPECIFIC ELECTIVE**  
**DSE HS 6-2: Innovation and Entrepreneurship**

**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		
Innovation and Entrepreneurship	4	1	0	3	XII Pass	NIL

**Learning Objectives**

- To motivate students to opt for innovation and entrepreneurship as a career option.
- To foster entrepreneurial traits and competencies
- To make students understand the critical role of creativity, design thinking and innovation in entrepreneurship development
- To prepare students to plan, launch and manage start-ups/enterprise
- To establish an ecosystem for students that is conducive to networking and incubating

**Learning outcomes**

After completing the course, students will be able to:

- Consider opting innovation and entrepreneurship as a career.
- Develop entrepreneurial traits and competencies.
- Ideate a viable business proposition.
- Network for venturing and innovating.
- Pitch a business proposal.

**SYLLABUS OF DSE 6-2**

**THEORY**  
**(Credit 1: Hours: 15)**

**UNIT I: Innovation**

**5 Hours**

- This unit focuses on developing the fundamental concept of innovation and its dimensions.
- Innovation: Concept, significance, types and process
- Innovation diffusion theory
- Innovation in organizations: Drivers and barriers, bottom-up and top-down approach, horizontal versus vertical approach
- Dimensions of innovation: Innovation eco-system in India, social Innovation, grassroots innovation, frugal innovation, and global Innovation-global innovation index framework (GII)

## **UNIT II: Creativity & Design thinking**

**4 Hours**

- The focus of this unit will be on developing the basic concepts and role of creativity & design thinking in innovation.
- Creativity- Concept, significance, role, processes and fostering creativity for innovation
- Design thinking: Concept, discipline, role, mindset, resources, and processes
- Design Thinking Approaches: Empathy, Ethnography, Divergent thinking, convergent thinking, Visual thinking, Assumption testing, Prototyping and Time for learning and validation

## **UNIT III: Entrepreneurship and Enterprise Management**

**6 hours**

This unit will orient the students to the concept of entrepreneurship and enterprise management.

- Entrepreneurship - Concept, stages, growth process, and entrepreneurship development in India, Government policies and schemes
- Entrepreneur- characteristics, competencies, types, styles, and motivation
- Enterprise & its management- types and strategies for Start-up launching, management and sustenance
- Exit strategies for a new startup- trends in India
- Networking & business ethics

## **PRACTICAL (Credit 3: Hours: 90)**

### **1. Entrepreneurial Motivation: Developing an appreciation for entrepreneurial traits and entrepreneurship as a career through**

**14 Hours**

- Entrepreneurial motivation orientation – Sector-specific case studies of successful entrepreneurs and profiling of required traits for innovation
- Understanding self as a prospective entrepreneur - Who am I?, Locus of control, Competency Profiling, SWOC analysis, Mapping entrepreneurial styles

### **2. Understanding and appreciating Innovations and design thinking:**

**20 Hours**

- Identification of innovations in day-to-day life
- Critical evaluation of innovations and design-driven solutions – case studies
- Environment scanning for business opportunities
- User's empathy mapping – understanding user's pain, pain creators and relievers

- Redesign activities for possible solutions - products and services
- Industry-integrated learning – live projects

**3. Market research & mapping start-up station: 12 Hours**

- Environment scanning for business opportunities
- Ideation: Generation, articulation, testing and incubating
- Develop a feasibility report

**4. Business plan and appraisal: 10 Hours**

- Business preparation
- Appraisal of business plan
- Risk auditing and mitigation

**5. Operations and Marketing management: 12 Hours**

- Develop operational management sheet and applications for registrations and licenses
- Familiarizing with the relevant documents, including the inventory and stock registers.
- Customer segmentation and profiling
- Prepare the 4Ps of the marketing mix, including digital marketing tools
- Prepare an elevator pitch

**6. Financial management: 12 Hours**

- Analysis of financial requirements and available capital
- Sources of finance - bootstrapping, crowdfunding, angel investing venture capital
- Financial statements, cash flow management, applicable interest rates of different types of loans
- Calculation of financial ratios, break-even analysis and applicable taxes
- Designing funding strategy and start-up valuation

**7. Human resource management and legal framework: 10 Hours**

- Functional requirements and cost implications
- Team formation
- Ensuring health and safety at the workplace
- Business communication
- Enterprise registration- Legal compliances, paperwork and cost
- Intellectual property rights

**Essential Readings:**

- Bhatt Arvind Kumar (2022). Innovation and Entrepreneurship. Atlantic publisher
- Chabbra T. N. (2019). Entrepreneurship Development. New Delhi: Sun India.
- Charantimath, P. M. (2018). Entrepreneurship Development and Small Business Enterprises. Pearson Publications.
- Carayanis Elias G, Samara Elpida T & Bakouros Yannis L.(2015). Innovation and Entrepreneurship. Springer.
- Drucker. Peter F. (2006), Innovation and Entrepreneurship. Harper Business

- Gundry L, K. & Kickul J. R. (2007). Entrepreneurship Strategy: Changing Patterns in New Venture Creation, Growth, and Reinvention. SAGE Publications, Inc.
- Santiago, Sam (2011), The official book of Innovation. Rising above LLC publisher
- Soni, Pwan.(2020). Design your thinking: The Mindsets, toolsets and skillsets for creative problem solving

#### **Suggested Readings:**

- Christensen M Clayton (2013). The innovator's dilemma. Harvard Business Review Press.
- Daum Callie (2020). Business strategy: essentials you always want. Vibrant publishers
- Goyal P. (2017). Before you start up: How to prepare to make your start-up a dream reality. Fingerprint publishing.
- HBR's 10 Must Reads on Startups and Entrepreneurship (2018). Featuring Bonus Article "Why the Lean Startup Changes Everything" by Steve Blank
- Nath,D. Mitra, S. (2020) Funding your startup and other nightmare. Penguin portfolio.
- Taneja & Gupta. (2001). Entrepreneur Development- New Venture Creation. New Delhi: Galgotia Publishing Company.

#### **Web references:**

- <https://web.iima.ac.in/assets/upload/mdp/480284395YEP%20Brochure.pdf>
- <https://www.iimb.ac.in/entrepreneurship>
- <https://www.mepsc.in/skill-based-programs/>
- <https://ediindia.ac.in/pgdm-innovation-entrepreneurship-venture-development/>

#### **Training material:**

- EMT kit developed by NIESBUD, New Delhi and EDII Ahmedabad

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**DEPARTMENT OF HOME SCIENCE**  
**SEMESTER – IV**

**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- 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		
<b>Food Hygiene Sanitation and Quality Control</b>	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* (2<sup>nd</sup> 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*. (6<sup>th</sup> 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*. (5<sup>th</sup> 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*. (2<sup>nd</sup> 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*. (4<sup>th</sup> edn.). Springer.
- WHO. *Water Sanitation and Health*. <https://www.who.int/health-topics/water-sanitation-and-hygiene-wash>. (Accessed on 10 March 2023).

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**



**DISCIPLINE SPECIFIC CORE COURSE****DSC-NHE-8: Nutrition Entrepreneurship****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		
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 be 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://foscoss.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](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.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**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, 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		
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 be 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://foscoss.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](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.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**DEPARTMENT OF HOME SCIENCE**  
**SEMESTER – V**

**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-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](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*. (2<sup>nd</sup> 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*. (3<sup>rd</sup> 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*. (14<sup>th</sup> edn.). Saunders-Elsevier.
- Agarwal, A., & Udipi, S. A. (2014). *Text book of human nutrition*. Jaypee Brothers Medical Publisher Ltd.
- Hickson, J. F., & Wolinsky, I. (1997). *Nutrition for exercise and sport*. (2<sup>nd</sup> edn.). CRC Press.

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### 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* (26<sup>th</sup> ed.). Banarsidas Bhanot Publishers.
- Uppal, A.K., & Ranganathan, P.P. (2020). *Fitness, wellness and nutrition* (1<sup>st</sup> 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*. (2<sup>nd</sup> 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).

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**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		
<b>Nutritional Approaches to Wellness and Longevity</b>	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* (26<sup>th</sup> ed.). Banarsidas Bhanot Publishers.
- Uppal, A.K., & Ranganathan, P.P. (2020). *Fitness, wellness and nutrition* (1<sup>st</sup> 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*. (2<sup>nd</sup> 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).

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**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		
<b>Nutrition during Emergencies and Disaster Management</b>	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](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*. (1<sup>st</sup> edn.).

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

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

**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		
<b>Preventive and Promotive Nutrition</b>	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*. (3<sup>rd</sup> 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](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.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**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		
<b>Preventive and Promotive Nutrition</b>	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*. (3<sup>rd</sup> 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](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.

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**DEPARTMENT OF HOME SCIENCE**  
**B.A (Prog) with Nutrition and Health Education (NHE)**  
**Pool of Discipline Specific Elective Course (DSE) for Odd Semester**  
*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*. (6<sup>th</sup> 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 Mukta 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* (13<sup>th</sup> edn.). Elsevier.
- Chaudhari, S. K. (2016). *Concise Medical Physiology* (7<sup>th</sup> edn.). New Central Book Agency (P) Ltd.
- *Manav sharir -rachna aur kriya- vgyan*, paper- 4 of PGDIPP, SIGFA Solutions  
<http://assets.vmou.ac.in/PGDIPP04.pdf> (Accessed on 10 March 2023).

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

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**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, 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		
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 NPWL 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*. (4<sup>th</sup> 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](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](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](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/Guidelines\\_for\\_immunization/Mission\\_Indradhanush\\_Guidelines.pdf](https://nhm.gov.in/New_Updates_2018/NHM_Components/Immunization/Guidelines_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., & Udupi, S. A. (2022). *Textbook of Human Nutrition* (2<sup>nd</sup> edn.). Jaypee Brothers (P) Ltd.
- *Poshan Abhiyan: Prime Minister's Over-reaching Scheme for Holistic Nourishment*. PIB press release [doc202112111.pdf \(pib.gov.in\)](https://pib.gov.in/doc202112111.pdf) (Accessed on 10 March 2023).

- UNICEF. *Women's Nutrition*. <https://www.unicef.org/india/what-we-do/womens-nutrition> (Accessed on 10 March 2023).

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**



## **DEPARTMENT OF HOME SCIENCE**

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

#### **Pool of Discipline Specific Elective Course (DSE) for Even Semester 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, its 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 its 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, its 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* (4<sup>th</sup> 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](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](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*. (15<sup>th</sup> 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>.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**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		
<b>Indigenous Indian Foods</b>	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*, Uttarakhand 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>.

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**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		
<b>Research Methods in Home Science</b>	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* 4<sup>th</sup> 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* 1<sup>st</sup> Ed. New Age International Pvt Ltd, New Delhi.
- Kumar, R. (2019) *Research Methodology: A Step-by-Step Guide for Beginners*. 5<sup>th</sup> 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](https://www.ugc.ac.in/e-book/Academic%20and%20Research%20Book_WEB.pdf) (Accessed on 10 March 2023).

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**DEPARTMENT OF HOME SCIENCE**

**Semester – IV**

**B.A (Prog.) with Human Development and Family Empowerment (HDFE)**

**B.A (Prog.) with Human Development and Family Empowerment (HDFE) as Major**

***Category-II***

**DISCIPLINE SPECIFIC CORE COURSE – DSC-7-HDFE: ECCE- PROGRAM PLANNING AND PRACTICES**

**CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
ECCE- Program Planning and Practices	4	2	-	2	Class XII	NIL

**Learning Objectives:**

1. To understand various aspects of planning and evaluation of ECCE centers.
2. To understand views of various philosophers in the area of ECCE
3. To develop skills and methods required for planning.

**Learning Outcomes:**

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

1. Develop skills and methods required for planning.
2. Understand the importance of planning in an ECCE program
3. Develop an effective curriculum based on the principles of program planning

**THEORY**

**(Credits 2, Hours 30)**

**UNIT I:** Understanding the need and importance of program planning

**(12 hours)**

Unit Description:

This unit provides a basic understanding about the aspects of planning in ECCE.

*Subtopics:*

- Program planning in ECCE: Definition and Principles
- Important considerations while planning programs for preschoolers (long term and short term goals)

## **UNIT II: Contribution of Indian and Western Philosophers in the field of ECCE (8 hours)**

### **Unit Description:**

This unit focuses on the contribution by various philosophers in the field of Early childhood Care and Education

### **Subtopics:**

- Indian Philosophers: Gijubhai Badheka, Tarabai Modak, Rabindranath Tagore, Mahatma Gandhi (Any two)
- Western Philosophers: F. Froebel, M. Montessori

## **UNIT III: Components of a successful ECCE program. (10 hours)**

### **Unit Description:**

This unit focuses on various important components of ECCE program.

### **Subtopics:**

- Planning space and equipment in an ECCE centre
- Roles and qualities of an ECCE worker
- Importance of community involvement.

### **PRACTICAL (Credits 2; Hours 60)**

1. Visit to an ECCE program/centre
2. Interview with an ECCE worker
3. Designing one-week Teaching Plan for an ECCE centre.

### **ESSENTIAL READINGS:**

- Aggarwal, J.C. and Gupta, S. (2007). *Early childhood care and education (First Ed.)*. New Delhi: Shipra Publications.
- Gupta, M. S. (2009). *Early childhood care and education*. PHI Learning Pvt. Ltd.
- IGNOU. Organizing Child Care Services: DECE-1. New Delhi: IGNOU
- Mohanty, J., & Mohanty, B. (1994). *Early Childhood Care and Education (ECCE)*. New Delhi: Deep & Deep Publications.
- Swaminathan, M. and Daniel, P. (2000). *Activity-based developmentally appropriate curriculum for young children*. Chennai: Indian Association for Pre-school Education.

### **SUGGESTED READINGS:**

- Kaul, V. and Bhatnagar, R. (2009). *Early childhood education: A trainers' handbook*. New Delhi: NCERT.
- Kulshreshtha, A. (2017). *Early Childhood Care and Education*. Kanishka Publisher, distributors.
- Roopnarine, J. L., & Johnson, J. E. (2012). *Approaches to Early Childhood Education* (5th ed.). Pearson.
- Swaminathan, M. (1998). *The first five years: A critical perspective on early childhood care and education in India*. New Delhi: Sage

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**DISCIPLINE SPECIFIC CORE COURSE – DSC-8-HDFE PRINCIPLES AND PERSPECTIVES ON ECCE**

**CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
<b>Principles &amp; Perspectives on ECCE</b>	4	2	-	2	Class XII	NIL

**Learning Objectives:**

- To understand the need and significance of early childhood care and education.
- To understand the policy perspectives on ECCE in India and world.
- To develop skills to make low-cost Teaching-Learning Material (TLM).

**Learning Outcomes:**

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

- Become sensitized on the significance of focusing on early years.
- Understand the policy perspectives of ECCE in India.
- Develop skills to make low-cost Teaching-Learning Material (TLM) and apply the principles of ECCE in a child care setting.

**THEORY**

**(Credits 2; Hours 30)**

**UNIT 1: Introduction to Early Childhood Care and Education (ECCE) (10 Hours)**

- Unit Description:

This unit gives an overview of ECCE while focusing on the importance of early years.

*Subtopics:*

- Definition and Objectives of ECCE
- Significance of investing in early childhood
- National ECCE Policy 2013

**UNIT 2: Developmental needs in Preschool years (10 Hours)**

- Unit Description:

This unit focuses on the developmental needs of preschoolers and making of the activities related to the different domains of development using play material

*Subtopics:*

- Physical-motor, cognitive, language and socio-emotional development in Preschool years
- Preparation and use of learning and play material – Principles & characteristics

**UNIT 3: Policy Perspectives in ECCE**

**(10 Hours)**

- Unit Description:

This unit focuses on creating awareness among students about the policies, legislations & programs related to ECCE in Indian context.

*Subtopics:*

- National Curriculum Framework 2005 and ECCE
- Role of Right to Education Act 2009 in promotion of ECCE
- Position of ECCE in New National Education Policy, 2020

**PRACTICAL**  
**(Credits 2; Hours 60)**

1. Designing low cost/environment friendly teaching-learning materials (TLM) and activities for all domains of development
2. Using prepared TLMs to gain hands on experience- One-week internship in nursery/pre/play school.

**ESSENTIAL READINGS:**

- Day, M., Kaul, V., & Sawhney, S. (2022). *Early childhood education for marginalized children in India: Deconstructing quality*. Sage Publications
- Bhattacharjea, S, Kaul, V. (2019). Early childhood education and school readiness in India: Quality and diversity. Springer Singapore
- NAEYC (National Association for the Education of Young Children). 2022. *Developmentally Appropriate Practice in Early Childhood Programs Serving Children from Birth Through Age 8*. 4th ed. Washington, DC: NAEYC
- National Education Policy (2020). Ministry of Human Resource Development. GOI. [https://www.education.gov.in/sites/upload\\_files/mhrd/files/NEP\\_Final\\_English\\_0.pdf](https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf).

**SUGGESTED READINGS:**

- Swaminathan, M. and Daniel, P. (2000). *Activity-based developmentally appropriate curriculum for young children*. Chennai: Indian Association for Pre-school Education.
- Aggarwal, J.C. and Gupta, S. (2007). *Early childhood care and education (First Ed.)*. New Delhi: Shipra Publications.
- Swaminathan, M. (1998). *The first five years: A critical perspective on early childhood care and education in India*. New Delhi: Sage.
- World Bank (2004). *Reaching out to the child: An integrated approach to child development*. New Delhi: Oxford University Press.

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**B.A (Prog.) with Human Development and Family Empowerment (HDFE) as  
Non-Major  
Category-III**

**DISCIPLINE SPECIFIC CORE COURSE – DSC-8-HDFE: PRINCIPLES AND  
PERSPECTIVES ON ECCE**

**CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
<b>Principles &amp; Perspectives on ECCE</b>	4	2	-	2	Class XII	NIL

**Learning Objectives:**

1. To understand the need and significance of early childhood care and education.
2. To understand the policy perspectives on ECCE in India and world.
3. To develop skills to make low-cost Teaching-Learning Material (TLM).

**Learning Outcomes:**

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

1. Become sensitized on the significance of focusing on early years.
2. Understand the policy perspectives of ECCE in India.
3. Develop skills to make low-cost Teaching-Learning Material (TLM) and apply the principles of ECCE in a child care setting.

**THEORY  
(Credits 2; Hours 30)**

**UNIT 1: Introduction to Early Childhood Care and Education (ECCE) (10 Hours)**

- Unit Description:

This unit gives an overview of ECCE while focusing on the importance of early years.

*Subtopics:*

- Definition and Objectives of ECCE
- Significance of investing in early childhood
- National ECCE Policy 2013

**UNIT 2: Developmental needs in Preschool years (10 Hours)**

- Unit Description:

This unit focuses on the developmental needs of preschoolers and making of the activities

related to the different domains of development using play material

*Subtopics:*

- Physical-motor, cognitive, language and socio-emotional development in Preschool years
- Preparation and use of learning and play material – Principles & characteristics

**UNIT 3: Policy Perspectives in ECCE**

**(10 Hours)**

- Unit Description:

This unit focuses on creating awareness among students about the policies, legislations & programs related to ECCE in Indian context.

*Subtopics:*

- National Curriculum Framework 2005 and ECCE
- Role of Right to Education Act 2009 in promotion of ECCE
- Position of ECCE in New National Education Policy, 2020

**PRACTICAL  
(Credits 2; Hours 60)**

1. Designing low cost/environment friendly teaching-learning materials (TLM) and activities for all domains of development
2. Using prepared TLMs to gain hands on experience- One-week internship in nursery/pre/play school.

**ESSENTIAL READINGS:**

- Day, M., Kaul, V., & Sawhney, S. (2022). *Early childhood education for marginalized children in India: Deconstructing quality*. Sage Publications
- Bhattacharjea, S, Kaul, V. (2019). Early childhood education and school readiness in India: Quality and diversity. Springer Singapore
- NAEYC (National Association for the Education of Young Children). 2022. *Developmentally Appropriate Practice in Early Childhood Programs Serving Children from Birth Through Age 8*. 4th ed. Washington, DC: NAEYC
- National Education Policy (2020). Ministry of Human Resource Development. GOI. [https://www.education.gov.in/sites/upload\\_files/mhrd/files/NEP\\_Final\\_English\\_0.pdf](https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf).

**SUGGESTED READINGS:**

- Swaminathan, M. and Daniel, P. (2000). *Activity-based developmentally appropriate curriculum for young children*. Chennai: Indian Association for Pre-school Education.
- Aggarwal, J.C. and Gupta, S. (2007). *Early childhood care and education (First Ed.)*. New Delhi: Shipra Publications.
- Swaminathan, M. (1998). *The first five years: A critical perspective on early childhood care and education in India*. New Delhi: Sage.
- World Bank (2004). *Reaching out to the child: An integrated approach to child development*. New Delhi: Oxford University Press.

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## **DEPARTMENT OF HOME SCIENCE**

### **SEMESTER V**

**B.A (Prog.) with Human Development and Family Empowerment (HDFE)**  
**B.A (Prog.) with Human Development and Family Empowerment (HDFE) as Major**  
*Category-II*

#### **DISCIPLINE SPECIFIC CORE COURSE – DSC-9-HDFE: WOMEN RIGHTS AND GENDER JUSTICE**

#### **CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
<b>Women Rights and Gender Justice</b>	4	2	-	2	Class XII	NIL

#### **LEARNING OBJECTIVES:**

- To understand women's rights and movements in India.
- To recognize gender issues prevailing in Indian society.
- To understand the legal frameworks for women in India.

#### **LEARNING OUTCOMES:**

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

- Identify gender issues existing in Indian society.
- Understand women laws, acts and movements in India.
- Comprehend the women's rights of India.

#### **THEORY** **(Credits 2; Hours 30)**

#### **UNIT I: Women Rights as Human Rights**

**(12 hours)**

##### *Unit Description:*

This unit provides awareness regarding women rights and movements in India.

##### *Subtopics:*

- Concept of women rights: Reproductive rights, Health education right, Employment and Legal rights.
- Women's movement in India: Chipko movement, Narmada Bachao Andolan, SEWA, SHGs etc.

## **UNIT II: Perspectives on Women Rights**

**(8 hours)**

### *Unit Description:*

This unit focuses on the concept of Feminism and the role of UN agencies in promoting Gender Justice.

### *Subtopics:*

- Feminism – 3 waves of Feminism
- Role of UN in promoting Gender Justice

## **UNIT III: Laws for Women in India: Path to Gender Justice**

**(10 hours)**

### *Unit Description:*

This unit focuses on generating awareness regarding laws for women in India.

### *Subtopics:*

- Protection of Women from Domestic Violence Act 2005
- Sexual Harassment of Women at workplace Act 2013
- The Maternity Benefit Act 1961

## **PRACTICAL (Credits 2; Hours 60 )**

4. Case study of any one law/movement related to Women's Right
5. Review of one documentary/book/video based on gender justice
6. Workshop/ talk/webinar on the topic of Gender sensitization

### **ESSENTIAL READINGS:**

- Chawla, M. (2013). Gender Justice: Women and Law in India, New Delhi
- Bhasin, K. (2000). Understanding Gender. New Delhi. Kaali for Women.
- Bhasin, K. (1986). Some questions on feminism. Jagori
- Chopra, G. (2015). Child Rights in India. Springer
- Vij, M. et.al (2014). Women's Studies in India, A journey of 25 years, Rawat Publication

### **SUGGESTED READINGS:**

- Brizendine, L. (2008). The Female Brain. Bantam books.
- Lips, Hilary M., (2015), Gender the basics, Routledge, London
- Rege, Sharmila. (2003). Sociology of Gender, New Delhi: Sage.
- Oberoi, P. (2006), Freedom and Destiny: Gender, Family and Popular Culture in India, Oxford University Press

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

## DISCIPLINE SPECIFIC CORE COURSE – DSC-10-HDFE: CHILD RIGHTS AND GENDER EQUITY

### CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Child Rights and Gender Equity	4	2	-	2	Class XII	NIL

### LEARNING OBJECTIVES:

- To understand the various definitions of child and child rights
- To learn about various dimensions of vulnerability with regard to children
- To understand contemporary gender issues

### LEARNING OUTCOMES:

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

- Acquire knowledge about child rights in India.
- Be sensitized to various dimensions of challenges faced by children.
- Develop insight on contemporary gender issues.

### THEORY (Credits 2; Hours 30)

#### UNIT I: Vulnerable Children- Need for Child Rights (12 hours)

*Unit Description:*

This unit focuses and gives students awareness about various groups of disadvantaged children.

#### ***Subtopics:***

- Understanding Exclusion and Vulnerability in Childhood
- Vulnerable Children-Magnitude and Classification

#### UNIT II: Concept of Child Rights (8 hours)

*Unit Description:*

This unit focuses on providing basic knowledge about rights for children in India and the role played by important stakeholders in protecting these rights.

#### ***Subtopics:***

- Definition of Child and Child Rights

- Protecting Child Rights-Laws and Policies for Children in India

### **UNIT III: Gender Equity- The way Ahead**

**(10 hours)**

#### *Unit Description:*

This unit focuses on the difference between equality and equity and process of socialization involved in constructing these perspectives.

#### ***Subtopics:***

- Gender Equity v/s Gender Equality-Concept and Scope
- Socialization for Gender Equity

### **PRACTICAL (Credits 2; Hours 60)**

1. Case Profile of a child in difficult circumstances
2. Poster making on Gender related issues
3. Portrayal of Gender (males and females) in school books/text-books/story books and magazines to identify the scope of gender equity.

#### **ESSENTIAL READINGS:**

- Bhasin, Kamla (2000). Understanding Gender. New Delhi. Kaali for Women.
- Goel, A, Kaur, A and Sultana, A (2006). Violence against women: Issues and Perspectives. New Delhi, Deep & Deep Publishers.
- Kataria, K. and Parihar, M. (2017) Women Empowerment Gender Equality and Social Justice. [Books Treasure](#).
- Monica, C. (2022). Gender Justice: Women and Law in India. Deep & Deep Publications.

#### **SUGGESTED READINGS:**

- Seidman, Steven (1996), (ed), 'Queer Theory/Sociology', Blackwell & V. Geetha, 2007, Patriarchy, Stree Publications, Calcutta
- Lips, Hilary M., (2015), Gender the basics, Routledge, London
- Pernau, Margrit, Imtiaz Ahmad and Helmut Reifeld, (2003), Family and Gender, Sage, New Delhi
- Oberoi, Patricia, (2006), Freedom and Destiny: Gender, Family and Popular Culture in India, Oxford University Press
- Rege, Sharmila. (2003). Sociology of Gender, New Delhi: Sage.

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**B.A (Prog.) with Human Development and Family Empowerment (HDFE) as**

**Non-Major**  
**Category-III**

**DISCIPLINE SPECIFIC CORE COURSE – DSC-10-HDFE: CHILD RIGHTS AND GENDER EQUITY**

**CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Child Rights and Gender Equity	4	2	-	2	Class XII	NIL

**LEARNING OBJECTIVES:**

- To understand the various definitions of child and child rights
- To learn about various dimensions of vulnerability with regard to children
- To understand contemporary gender issues

**LEARNING OUTCOMES:**

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

- Acquire knowledge about child rights in India.
- Be sensitized to various dimensions of challenges faced by children.
- Develop insight on contemporary gender issues.

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Vulnerable Children- Need for Child Rights (12 hours)**

*Unit Description:*

This unit focuses and gives students awareness about various groups of disadvantaged children.

**Subtopics:**

- Understanding Exclusion and Vulnerability in Childhood
- Vulnerable Children-Magnitude and Classification

**UNIT II: Concept of Child Rights (8 hours)**

*Unit Description:*

This unit focuses on providing basic knowledge about rights for children in India and the role played by important stakeholders in protecting these rights.

**Subtopics:**

- Definition of Child and Child Rights
- Protecting Child Rights-Laws and Policies for Children in India

### **UNIT III: Gender Equity- The way Ahead**

**(10 hours)**

#### *Unit Description:*

This unit focuses on the difference between equality and equity and process of socialization involved in constructing these perspectives.

#### *Subtopics:*

- Gender Equity v/s Gender Equality-Concept and Scope
- Socialization for Gender Equity

### **PRACTICAL (Credits 2; Hours 60)**

1. Case Profile of a child in difficult circumstances
2. Poster making on Gender related issues
3. Portrayal of Gender (males and females) in school books/text-books/story books and magazines to identify the scope of gender equity.

### **ESSENTIAL READINGS:**

- Bhasin, Kamla (2000). Understanding Gender. New Delhi. Kaali for Women.
- Goel, A, Kaur, A and Sultana, A (2006). Violence against women: Issues and Perspectives. New Delhi, Deep & Deep Publishers.
- Kataria, K. and Parihar, M. (2017) Women Empowerment Gender Equality and Social Justice. [Books Treasure](#).
- Monica, C. (2022). Gender Justice: Women and Law in India. Deep & Deep Publications.

### **SUGGESTED READINGS:**

- Seidman, Steven (1996), (ed), 'Queer Theory/Sociology', Blackwell & V. Geetha, 2007, Patriarchy, Stree Publications, Calcutta
- Lips, Hilary M., (2015), Gender the basics, Routledge, London
- Pernau, Margrit, Imtiaz Ahmad and Helmut Reifeld, (2003), Family and Gender, Sage, New Delhi
- Oberoi, Patricia, (2006), Freedom and Destiny: Gender, Family and Popular Culture in India, Oxford University Press
- Rege, Sharmila. (2003). Sociology of Gender, New Delhi: Sage.

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**DEPARTMENT OF HOME SCIENCE**  
**SEMESTER – VI**

**B.A (Prog.) with Human Development and Family Empowerment (HDFE)**  
**B.A (Prog.) with Human Development and Family Empowerment (HDFE) as Major**  
**Category-II**

**DISCIPLINE SPECIFIC CORE COURSE – DSC-HDFE-11: EARLY INTERVENTION  
AND SERVICES FOR CHILDREN WITH DISABILITY**

**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		
Early Intervention and Services for Children with Disability	4	2	0	2	Class XII	NIL

**LEARNING OBJECTIVES:**

- To introduce students regarding the concept and significance of Early Intervention.
- To make students aware regarding the issues and challenges in Early Intervention
- To equip students regarding the services for Children with Disability

**LEARNING OUTCOMES:**

After completion of the course:

- Students will gain an insight regarding the concept and significance of Early Intervention.
- Students will develop an understanding regarding the issues and challenges in Early Intervention
- Students will become aware regarding the services for Children with Disability

**THEORY**

**(Credits 2; Hours 30)**

**UNIT 1: Understanding Early Intervention**

**(10 Hours)**

*Unit Description:* This unit will introduce the students regarding the concept and significance of Early Intervention.

***Subtopics***

- Meaning, Significance and Need of Early Intervention
- Principles, Screening and Assessment Tools in Early Intervention

## **UNIT 2: Early Intervention in practice – Opportunities and Challenges (10 Hours)**

*Unit Description:* This unit will introduce the students with issues and challenges in Early Intervention.

### ***Subtopics:***

- Issues and challenges in Early Intervention
- Working with families: Role of parents

## **UNIT 3: Services for Children with Disability (10 Hours)**

*Unit Description:* This unit will introduce students regarding the services for Children with Disability

### ***Subtopics:***

- Educational Approaches for Children with Disability (Inclusive, Integrated, Segregated, and Home based education)
- Need and importance of Individualized Education Plans (IEPs) in education of children with disability

### **PRACTICAL ( Credits 2; Hours 60)**

1. Interview of a caregiver providing services to a child/person with disability
2. Identification of any one Standardized Assessment Tool for children with disability and preparation of a checklist for early detection of disability.
3. Documentation of any two IEPs for children with disability

### **ESSENTIAL READINGS:**

- Mangal, S.K. (2007). *Educating exceptional children*. New Delhi: PHI Learning
- National Human Rights Commission (2005). *Disability manual*. New Delhi: NHRC
- NCERT (2014). *Including children with special needs*. New Delhi: NCERT
- Ramesh, R (2011). *Disability Towards Inclusive India*. Pentagon Press
- Pal, C. and Viswakarma, V (2011). *Vishesh shiksha - shikshan*. New Delhi: Kanishka Publishers, Distributors
- Nair, R. (2013). Development and Validation of Trivandrum Development Screening Chart for children aged 0-6 years, *The Indian Journal of Pediatrics*. DOI:10.1007/s12098-013-1144-2

### **SUGGESTED READINGS:**

- NCERT (2006). *Education of children with special needs*. New Delhi: NCERT
- NCERT (2010). *Towards inclusive education*. New Delhi: NCERT
- Sharma, Y.K. (2009). *Sharireki roop se viklagng balak*. New Delhi: Kanishka Publishers, Distributors.
- Werner, D. (1994). *Disabled Village Children (2022 Edition)*. Voluntary Health Association of India

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**



**DISCIPLINE SPECIFIC CORE COURSE – DSC-HDFE-12: CHILDREN WITH DISABILITY IN INDIA**

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
<b>Children with Disability in India</b>	4	2	0	2	Class XII	NIL

**LEARNING OBJECTIVES:**

- To introduce students regarding etymology of disability.
- To make students aware regarding the categorization of children with disability.
- To equip students with the knowledge of policies, provisions and organizations for children with disability.

**LEARNING OUTCOMES:**

After completion of the course:

- Students will gain an insight regarding terms concerning disability.
- Students will develop an understanding regarding the categorization of children with disability.
- Students will become aware regarding the policies, provisions and organizations for children with disability.

**THEORY**

**(Credits 2; Hours 30)**

**UNIT 1: Understanding Disability**

**(10 Hours)**

*Unit Description:* This unit will introduce the Historical Perspective of Disability along with the attitude of society towards disability.

***Subtopics***

- Etymology of Disability-Understanding ICIDH by WHO
- Models of Disability (Charity, Medical, Social and Right based model)

**UNIT 2: Categorization of Children with Disability**

**(10 Hours)**

*Unit Description:* This unit will introduce the students with Categorization of Children with Disability along with its causes and prevention.

***Subtopics:***

- Categorization of Children with Disability
- Causes and Prevention of Disabilities in Children

### **UNIT 3: Children with Disability in India- Magnitude and Provisions (10 Hours)**

*Unit Description:* This unit will introduce the Policies, Provisions and Organizations for Children with Disability.

#### ***Subtopics:***

- Demographic profile of Children with Disability in India
- Enlist the policies, provisions and laws with respect to Disability- Eg: Rehabilitation Council of India Act (1992), National Trust for Welfare of Persons with Autism, cerebral Palsy, Mental retardation & Multiple Disability Act (1999), National Policy for Persons with Disabilities (2006)
- Rights of Persons with Disability (RPWD) Act, 2016

#### **PRACTICAL ( Credits 2; Hours 60)**

1. Case study of any one organization such as RCI, NAB etc working for Children with Disability.
2. Poster/pamphlet on causes and prevention of disabilities in children.
3. Using your observations and personal experiences enlist how your institution is accessible for People with Disability.

#### **ESSENTIAL READINGS:**

- Mangal, S.K. (2007). *Educating exceptional children*. New Delhi: PHI Learning
- National Human Rights Commission (2005). *Disability manual*. New Delhi: NHRC
- NCERT (2014). *Including children with special needs*. New Delhi: NCERT
- Ramesh, R (2011). *Disability Towards Inclusive India*. Pentagon Press
- NCERT (2010). *Towards inclusive education*. New Delhi: NCERT

#### **SUGGESTED READINGS:**

- NCERT (2006). *Education of children with special needs*. New Delhi: NCERT
- Pal, C. and Viswakarma, V (2011). *Vishesh shiksha - shikshan*. New Delhi: Kanishka Publishers, Distributors.
- Sharma, Y.K. (2009). *Shaririki roop se viklagng balak*. New Delhi: Kanishka Publishers, Distributors.
- Werner, D. (1994). *Disabled Village Children (2022 Edition)*. Voluntary Health Association of India

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### **B.A (Prog.) with Human Development and Family Empowerment (HDFE) as Non-Major Category-III**

## DISCIPLINE SPECIFIC CORE COURSE – DSC-HDFE-12: CHILDREN WITH DISABILITY IN INDIA

### 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		
<b>Children with Disability in India</b>	4	2	0	2	Class XII	NIL

#### LEARNING OBJECTIVES:

- To introduce students regarding etymology of disability.
- To make students aware regarding the categorization of children with disability.
- To equip students with the knowledge of policies, provisions and organizations for children with disability.

#### LEARNING OUTCOMES:

After completion of the course:

- Students will gain an insight regarding terms concerning disability.
- Students will develop an understanding regarding the categorization of children with disability.
- Students will become aware regarding the policies, provisions and organizations for children with disability.

### THEORY

(Credits 2; Hours 30)

#### UNIT 1: Understanding Disability

(10 Hours)

*Unit Description:* This unit will introduce the Historical Perspective of Disability along with the attitude of society towards disability.

##### *Subtopics*

- Etymology of Disability-Understanding ICIDH by WHO
- Models of Disability (Charity, Medical, Social and Right based model)

#### UNIT 2: Categorization of Children with Disability

(10 Hours)

*Unit Description:* This unit will introduce the students with Categorization of Children with Disability along with its causes and prevention.

***Subtopics:***

- Categorization of Children with Disability
- Causes and Prevention of Disabilities in Children

**UNIT 3: Children with Disability in India- Magnitude and Provisions (10 Hours)**

*Unit Description:* This unit will introduce the Policies, Provisions and Organization's for Children with Disability.

***Subtopics:***

- Demographic profile of Children with Disability in India
- Enlist the policies, provisions and laws with respect to Disability- Eg: Rehabilitation Council of India Act (1992), National Trust for Welfare of Persons with Autism, cerebral Palsy, Mental retardation & Multiple Disability Act (1999), National Policy for Persons with Disabilities (2006)
- Rights of Persons with Disability (RPWD) Act, 2016

**PRACTICAL:  
(Credits 2; Hours 60)**

1. Case study of any one organization such as RCI, NAB etc working for Children with Disability.
2. Poster/pamphlet on causes and prevention of disabilities in children.
3. Using your observations and personal experiences enlist how your institution is accessible for People with Disability.

**ESSENTIAL READINGS:**

- Mangal, S.K. (2007). *Educating exceptional children*. New Delhi: PHI Learning
- National Human Rights Commission (2005). *Disability manual*. New Delhi: NHRC
- NCERT (2014). *Including children with special needs*. New Delhi: NCERT
- Ramesh, R (2011). *Disability Towards Inclusive India*. Pentagon Press
- NCERT (2010). *Towards inclusive education*. New Delhi: NCERT

**SUGGESTED READINGS:**

- NCERT (2006). *Education of children with special needs*. New Delhi: NCERT
- Pal, C. and Viswakarma, V (2011). *Vishesh shiksha - shikshan*. New Delhi: Kanishka Publishers, Distributors.
- Sharma, Y.K. (2009). *Shaririki roop se viklagng balak*. New Delhi: Kanishka Publishers, Distributors.
- Werner, D. (1994). *Disabled Village Children (2022 Edition)*. Voluntary Health Association of India

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**Department of Home Science**

**B.A (Prog.) with Human Development and Family Empowerment (HDFE)**

**Pool of Discipline Specific Electives (DSEs)**

<b><u>S. No.</u></b>	<b><u>Content</u></b>	<b><u>Page No.</u></b>
	<b><u>Odd Semester</u></b>	
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<b>2.</b>	Language Development and Early Literacy	4-5
<b>3.</b>	Developing Early Childhood Curriculum	6-7
	<b><u>Even Semester</u></b>	
<b>1.</b>	Education and Rehabilitation approaches for Person with Disabilities	8-9
<b>2.</b>	Socio-Emotional Development: A lifespan perspective	10-11
<b>3.</b>	Research Methods in Home Science	12-14

## ODD SEMESTER

### DISCIPLINE SPECIFIC ELECTIVE – DSE-HDFE –CHILDREN IN ESPECIALLY DIFFICULT CIRCUMSTANCES

#### 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		
Children in Especially Difficult Circumstances	4	2	0	2	Class XII	NIL

#### LEARNING OBJECTIVES:

1. To learn about various dimensions of vulnerability with regard to children
2. To create awareness about various groups of disadvantaged children
3. To create understanding about the organizations and services available for disadvantaged children

#### LEARNING OUTCOMES:

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

1. Become aware and acquire knowledge about child rights in India.
2. Be sensitized to the various dimensions of challenges faced by children.
3. Become aware about the organizations, institutions and services for disadvantaged children.

#### THEORY

(30 Hours)

#### UNIT 1: Overview of Children in Especially Difficult Circumstances (CEDC)

(6 Hours)

Unit Description:

This unit provides a basic understanding about all the aspects of CEDC.

##### *Subtopics:*

- Definition of CEDC
- Classification of CEDC
- Magnitude and Causes

#### UNIT 2: Categories of CEDC: Issues and Challenges

(12 Hours)

Unit Description:

This unit focuses on various categories of disadvantaged children and challenges faced by them.

##### *Subtopics:*

- Children in conflict with law
- Street children
- Child labour
- Child trafficking

### Unit 3: Provisions for child protection in India

(12 Hours)

#### Unit Description:

This unit focuses on providing information about the various organizations, laws and programs available in India for children in especially difficult circumstances

#### Subtopics:

- Concept of child protection: NCPCR, Childline
- Protection of Children from Sexual Offences Act (POCSO, 2012)
- Child Labour (Prohibition and Regulation) Amendment Act, 2016
- Juvenile Justice (Care and Protection of Children) Act, 2015
- Organizations working for Child protection: Prayas, Butterflies, Bachpan Bachao Andolan

#### PRACTICAL (Credits 2; 60 Hours)

- Poster making/ News articles collection on the issue of child abuse
- Film review/Visit to an organization working for child protection
- Case profile of a working child/ Street child

#### ESSENTIAL READINGS:

- Bajpai, A. (2006). *Child rights in India: law, policy and practice*. New Delhi: Oxford University Press.
- Chopra, G. (2015). *Child rights in India: Challenges and social action*. New Delhi: Springer.
- सेतिया. ए. (2012). बच्चों के कानूनी हक। उत्तराखंड: राज्य बाल अधिकार संरक्षण आयोग  
E-book retrieved from <http://wecd.uk.gov.in/files/book.pdf>

#### SUGGESTED READINGS:

- Children in Difficult Circumstances. Retrieved from <https://www.planindia.org/wp-content/uploads/2019/09/CIDC-Report-compressed.pdf>
- NIPCCD (2002). *Children in difficult circumstances: Summaries of research*. New Delhi: Resource Centre on Children.
- Sathpathy, C. (2013). *Child welfare policies and programme in India*. Insights of India, Issues concerning children. <https://www.insightsonindia.com/wp-content/uploads/2013/09/child-welfare-policies-and-programmes-in-india.pdf>
- भारत में बाल संरक्षण कानूनों का सारांश. SATYARTHI: Kailash Satyarthi Children's Foundation  
Retrieved from [https://satyarthi.org.in/wp-content/uploads/BondedLabor/Hindi/Summary%20of%20Child%20Protection%20Laws\\_Hindi.pdf](https://satyarthi.org.in/wp-content/uploads/BondedLabor/Hindi/Summary%20of%20Child%20Protection%20Laws_Hindi.pdf)

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**DISCIPLINE SPECIFIC ELECTIVE – DSE-HDFE -LANGUAGE DEVELOPMENT AND EARLY LITERACY**

**CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
<b>Language Development and Early Literacy</b>	4	2	0	2	Class XII	NIL

**LEARNING OBJECTIVES:**

1. To understand how language development takes place.
2. To understand the role of early stimulation in language development.
3. To understand the role of the family and school in language development of children.

**LEARNING OUTCOMES:**

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

1. Understand the process of language development
2. Get awareness regarding the importance of early stimulation
3. Understand the role of family and school in language development

**THEORY**

(Credits 2; 30 hours)

**Unit I: Language and Communication**

(11 hours)

**Unit Description:**

This unit focuses on providing basic knowledge about language and its importance.

**Subtopics:**

- Language and its importance
- Language Acquisition
- Grammar, Phonetics, Semantics

**Unit II: Stages of Language Development**

(11 hours)

**Unit Description:**

This unit focuses on various factors and problems related to language development during different life stages

**Subtopics:**

- Language Development through Infancy, Childhood and Adolescence
- Factors affecting language development
- Early Identification of problems related to language development



### Unit III: Role of Family and School

(08 hours)

#### Unit Description:

This unit focuses on the importance of stimulation in language development

#### Subtopics:

- Home Stimulation
- Role of Caregiver in language development
- School Enrichment Programme
- Role of a Teacher

### PRACTICAL

(Credits 2; Hours 60)

- Identification and documentation of early literacy programs in the country (Any two)
- Preparation of booklets for reading readiness
- Organizing Workshop /webinar/ interactive session on communication skills of children and report writing.

#### ESSENTIAL READINGS:

- Hetherington E.M. and Parke R.D. Gauvin M. Locke V.O. (2006). *Child Psychology -A Contemporary view point*. Mc Graw- Hill Education
- Verma, P., Srivastava, D. N. and Singh, A. (2020). *Bal manovigyan and bal vikas*. (and all further editions) Agra: Agrawal Publication.
- Singh, V. (2007). *Bal vikas avam bal manovigyan*. Jaipur: Panchsheel Prakashan.
- Mangal S.K. (2007). *Educating Exceptional Children*. New Delhi: PHI Learning

#### SUGGESTED READINGS:

- Papilla D.E., Olds S.W. and Feldman R.D. (2004). *Human Development*. New York: Mc Graw-Hill
- Woolfolk A., Mishra G. Jha, A.K. (2012). *Educational Psychology*. Pearson Education, Inc.
- Santrock J.W. (2013). *Life Span Approach*. Mc Graw-Hill Education. India
- IGNOU- BES-008 *Language and Early Literacy Block -3*, Language Acquisition and Language Learning: Preschool and Early Years Unit 6, Classroom Language and Literacy- Hindi/English

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

## DISCIPLINE SPECIFIC ELECTIVE – DSE-HDFE-DEVELOPING EARLY CHILDHOOD CURRICULUM

### CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
Developing Early Childhood Curriculum	4	2	0	2	Class XII	NIL

#### LEARNING OBJECTIVES:

1. To understand need and significance of early childhood period.
2. To understand meaning, scope and significance of curriculum development in ECCE.
3. To develop skills to holistically develop and evaluate the curriculum.

#### LEARNING OUTCOMES:

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

1. Get awareness and acquire knowledge about early childhood.
2. Understand curriculum designing and evaluation for early childhood years.
3. Understand pedagogical approaches in early childhood curriculum.

#### THEORY

**(30 hours)**

#### Unit I: Development during early years and importance of curriculum development

**(12 hours)**

##### Unit Description:

This unit provides a basic understanding about Early Childhood Curriculum.

##### *Subtopics:*

- Developmental Milestones (birth -8years)
- Meaning and significance of Curriculum Development
- Qualities of a good curriculum for providing Early Childhood Education (ECE)

#### Unit II: Content and Pedagogy in Early Childhood Curriculum

**(8 hours)**

##### Unit Description:

This unit focuses on providing basic knowledge about Pedagogy in Early Childhood Curriculum.

##### *Subtopics:*

- Understanding different pedagogical approaches (Activity/theme based, play-way, child centered)
- Selection of activities and learning aids for different age-groups (Infancy, Pre-school and Early School stages)

#### Unit III: Curriculum Assessment

**(10 hours)**

##### Unit Description:

This unit focuses on the holistic evaluation and curriculum assessment

**Subtopics:**

- Assessment and evaluation: Need and tools
- Holistic evaluation of the curriculum: Child, Staff, Center, Learning activities

**PRACTICAL****(60 hours)**

- Develop One Week Schedule (Curriculum) for 3-6 and 6-8 years old
- Prepare a checklist for evaluating an ECE Curriculum
- Make assessment of a child (3-6 years) using the 'Child Assessment Card' issued by Ministry of Women & Child Development, GOI.

**ESSENTIAL READINGS:**

- Aggarwal, J.C. and Gupta, S. (2007). *Early childhood care and education (First Ed.)*. New Delhi: Shipra Publications.
- Gupta, M. S. (2009). *Early childhood care and education*. PHI Learning Pvt. Ltd.
- Mohanty, J., & Mohanty, B. (1994). *Early Childhood Care and Education (ECCE)*. New Delhi: Deep & Deep Publications.
- Swaminathan, M. and Daniel, P. (2000). *Activity-based developmentally appropriate curriculum for young children*. Chennai: Indian Association for Pre-school Education.
- Romila Soni, R. (2015). Theme Based Early Childhood Care and Education Programme: A Resource Book. National Council of Educational Research and Training.
- Theory and Practice in Early Childhood Care and Education. Managing Children's Programmes: Some Perspectives. Indira Gandhi National Open University DECE Study Material

**SUGGESTED READINGS:**

- Kaul, V. and Bhatnagar, R. *Early childhood education: A trainers' handbook*. New Delhi: NCERT.
- Kulshreshtha, A. (2017). *Early Childhood Care and Education*. Kanishka Publisher, distributors.
- Swaminathan, M. (1998). *The first five years: A critical perspective on early childhood care and education in India*. New Delhi: Sage.
- Morrison, G. S. (2003). *Fundamentals of early childhood education*. Merrill/Prentice Hall: Virginia
- Singh, A. (1995). *Playing to Learn: A training manual for Early Childhood Education*. M. S. Swaminathan Research Foundation.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

## **EVEN SEMESTER**

### **DISCIPLINE SPECIFIC ELECTIVE – DSE-HDFE-EDUCATION AND REHABILITATION APPROACHES FOR PERSONS WITH DISABILITIES**

#### **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		
Education and Rehabilitation Approaches for Persons with Disabilities	4	2	0	2	Class XII	NIL

#### **LEARNING OBJECTIVES:**

1. To introduce students to educational approaches for Persons with Disabilities
2. To help students gain an understanding of Assistive Technology and ICT for Persons with Disabilities.
3. To make the students understand about Rehabilitation Approaches for Persons with Disabilities

#### **LEARNING OUTCOMES:**

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

1. Develop an understanding regarding educational approaches for persons with disabilities.
2. Gain an insight regarding assistive technology and ICT for persons with disabilities.
3. Get awareness about the rehabilitation approaches for persons with disabilities.

#### **THEORY:**

**(Credits 2; Hours 30)**

#### **UNIT 1: Introduction to educational approaches for Persons with Disabilities (10 Hours)**

##### **Unit Description:**

This unit will introduce the educational approaches for Persons with Disabilities.

##### **Subtopics:**

- Paradigm shift in educational approach from Segregation to Inclusion
- Role of significant others in developing self-image and self-esteem of Persons with Disabilities.
- Deno-cascade model of service delivery.

#### **Unit 2: Assistive Technology and ICT for Persons with Disabilities (10 Hours)**

##### **Unit Description:**

This unit will introduce students to different Assistive Technology and its uses for persons with disabilities.

##### **Subtopics:**

- Understanding ICT and its role in Classroom learning
- Assistive devices and their importance for Persons with Disabilities (Braille-books, Hearing Aids, Walking Canes etc.)

### **UNIT 3: Rehabilitation Approaches for Persons with Disabilities**

**(10 Hours)**

#### **Unit Description:**

This unit will lay emphasis on understanding the concept of Rehabilitation Approaches for Persons with Disabilities.

#### **Subtopics:**

- Therapeutic Intervention – Occupational therapy (OT), Physio-Therapy (PT) and Speech Therapy (ST)
- Community Based Rehabilitation (CBR)
- Institution Based Rehabilitation (IBR)

#### **PRACTICAL (Credits 2; Hours 60)**

1. Interview a person with disability to understand role of significant others in their life.
2. Identify various ICT tools and how they facilitate learning of persons with disabilities
3. Prepare a list of assistive devices for persons with disabilities and their use.

#### **ESSENTIAL READINGS:**

- Kozma, R.B. (2003). Technology, Innovation, and Educational Change: A Global Perspective: A Report of the Second Information Technology in Education Study, Module 2. International Society for Technology in Education
- Abbot, C. (2001). ICT: Changing Education. Routledge Falmer.
- Florian, L., & Hegarty J. (2004). ICT and Special Educational Needs: A Tool for Inclusion. Open University Press, Maidenhead.
- Scheme of Assistance to Disabled for Purposes of Fitting of Aids/Appliances (2014). Ministry of Social Welfare, Govt. of India, New Delhi.
- Ladau E. (2021). Demystifying Disability: What to Know, What to Say, and How to Be an Ally, Ten Speed Press Publisher
- Nair, R. (2013). Development and Validation of Trivandrum Development Screening Chart for children aged 0-6 years, The Indian Journal of Pediatrics. DOI:10.1007/s12098-013-1144-2

#### **SUGGESTED READINGS:**

- Scheme of Assistance to Organizations for Disabled Persons, Ministry of Social Welfare, Govt. of India, New Delhi.
- WHO. (1982). Community Based Rehabilitation — Report of a WHO International Consultation, Colombo, Sri Lanka, 28 June- 3 July. WHO (RHB/IR/82.1)
- WHO. (1984). "Rehabilitation For All" in World Health Magazine, WHO, Geneva
- Loveday, M. (2006). The HELP Guide for Community Based Rehabilitation Workers: A Training Manual. Global-HELP Publications, California.
- McConkey, R. and O' Tool, B (Eds). Innovations in Developing Countries for People with Disabilities, P.H. Brookes, Baltimore.
- Sarva Siksha Abhiyan. Module on Multiple Disabilities. <http://ssa.nic.in/inclusive-education/training-module-for-resource-teachers-for-disable->

children/Module%203%20Multiple%20Disability.pdf/at\_download/

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC ELECTIVE – DSE- HDFE-: SOCIO-EMOTIONAL DEVELOPMENT:  
A LIFESPAN PERSPECTIVE**

**CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITE OF THE COURSE**

Course Title & Code	Credits	Credit distribution of the course			Eligibility Criteria	Prerequisite of the course
		Lecture	Tutorial	Practical/ Practice		
<b>Socio-Emotional Development: A Lifespan Perspective</b>	4	2	0	2	Class XII	NIL

**LEARNING OBJECTIVES:**

- To enable students to understand the concept and relevance of social and emotional skills.
- To provide a lifespan perspective of socio-emotional skills to the students.
- To enable students in understanding various factors promoting socio-emotional skills in humans.

**LEARNING OUTCOMES:**

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

- Understand the concept and relevance of social and emotional skills.
- Get a lifespan perspective of socio-emotional skills.
- Understand various factors promoting socio-emotional skills in humans.

**THEORY  
(Credits 2; Hours 30 )**

**UNIT I: Introduction to Socio-Emotional Development (8 hours)**

**Unit Description:**

This unit focuses on making students understand the concept and importance of socio-emotional development in human beings.

**Subtopics:**

- Socio-Emotional Development: Concept and importance
- Critical Socio-Emotional Skills: Empathy, Managing Self and Social Relationships, Critical thinking, Conflict Resolution
- Social and Emotional Intelligence: Meaning and relevance

**UNIT II: Importance of Socio-Emotional Development in Human Lifespan (12 hours)**

**Unit Description:**

This unit focuses on providing a life-span perspective in understanding the importance of socio-emotional skills

**Subtopics:**

- Socio-Emotional Development and Psycho-Social theory of Development:

- Childhood years
- Adolescence
- Adulthood

### **UNIT III: Factors affecting Socio-Emotional Development**

**(10 hours)**

#### **Unit Description:**

This unit focusses on important factors like family, school etc. that play an important role in developing socio-emotional skills in humans

#### **Subtopics:**

- Role of Family/ Parenting Strategies
- Role of School, Teachers and Peers

#### **PRACTICAL (Credits 2; Hours 60)**

1. Plan and document any two activities to improve socio-emotional skills in children.
2. Discuss and analyze any one standardized program for promoting Socio-Emotional Learning. Eg: Collaborative for Academic, Social and Emotional Learning (CASEL), Promoting Alternative Thinking Strategies (PATHS) etc.
3. Review a movie/documentary/video about emotional problems faced by children in school (Eg. bullying, peer pressure) and write learnings from it

#### **ESSENTIAL READINGS:**

- Goleman, D. (2005). *Emotional intelligence: Why it can matter more than IQ*. Bantam Publications
- Sapra, R. (2020). Resilience as a Significant Factor in Child and Adolescent Health Pp 179-198. In *Handbook on Child and Adolescent Behavior and Health*. Ed Antonio Araujo Goncales, Nova Science Publishers, New York
- Berk, L. E. (2017). *Development through the lifespan* (7rd edition). US: Pearson Education.
- Singh, A. (2015). *Foundation of Human development: A lifespan approach*. London: Orient Longman.

#### **SUGGESTED READINGS:**

- Burk, D.I (1996) Understanding Friendship and Social Interaction. *Childhood Education*, 282-85
- Advancing Social and Emotional Learning. CASEL.org. Retrieved from <https://casel.org/>
- Sapra, R. (2020). Parenting Children for Emotion Regulation and Resilience: A Review. *International Journal of Science and Research*. Volume9 Issue 5.

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## 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		
<b>Research Methods in Home Science</b>	<b>4</b>	<b>3</b>	<b>0</b>	<b>1</b>	XII Pass	NIL

### 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

### 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; 30 Hours)**

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* 4<sup>th</sup> 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* 1<sup>st</sup> Ed. New Age International Pvt Ltd, New Delhi.
- Kumar, R. (2019) *Research Methodology: A Step-by-Step Guide for Beginners*. 5<sup>th</sup> 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](https://www.ugc.ac.in/e-book/Academic%20and%20Research%20Book_WEB.pdf)

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## **DEPARTMENT OF HOME SCIENCE**

### **Semester – IV**

**B.A (Prog.) with Apparel Design and Construction (ADC) as Major**  
***Category-II***

#### **DISCIPLINE SPECIFIC CORE COURSE – DSC-7-ADC: FASHION: DESIGN AND DEVELOPMENT**

#### **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		
Fashion: Design & Development	4	2	0	2	Class XII	NIL

#### **Learning Objectives:**

- To give the learners an overview of the garment design and development process.
- To provide an understanding of the industrial practice of techpack preparation and sample development and testing.

#### **Learning Outcomes:**

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

- Develop a garment collection using the steps of design and development process.
- Develop techpack for garment designs.
- Estimate the material requirement and prepare a cost sheet for a garment design.
- Describe the role of various types of samples used in garment manufacturing.
- Enumerate the steps in the development of proto and fit samples
- Evaluate proto samples based on various criteria
- Conduct fitting sessions for sample evaluation.

#### **SYLLABUS OF DSC-7**

##### **THEORY** **(Credits 2; Hours 30)**

##### **UNIT I: Design and Development process**

**5 Hours**

This unit provides an overview of design and development process in the preparation of a garment collection.

- Basic Steps in the Design process: Ideation and inspiration research, Mood board/theme board development, Design Development, Flat and technical drawings, Use of CAD software for design development, Design finalization based on feedback and improvement.

- Basic steps in the Development process: Techpack development, Sourcing, Sampling, Fit review, Design approval, Production

## **Unit II: Techpack Development and Cost sheet**

**15 Hours**

This unit appraises the learners of the Industry practice of using Techpack and cost sheet in garment making.

- Tech pack and its importance, Components of Tech pack
- Tech pack terminology
- Steps in the development of tech packs
- Estimation of fabrics, materials, supplies and production processes
- Development of Cost Sheet

## **Unit III: Sample Development and testing**

**10 Hours**

This unit imparts knowledge about the concept of sample development and testing

- Importance of sample making - Types and roles of sample
- Steps in development of prototype and fit samples, Evaluation criteria for prototype samples
- Fit - Factors influencing fit, Conducting fit sessions, Preparations for fitting, sample evaluation

### **PRACTICAL (Credits 2; 60 Hours)**

1. Development of design collection of four garments for selected season.
2. Development of mock tech-pack of any one design
3. Preparation of cost sheet
4. Preparation of prototype sample of any one garment.

### **ESSENTIAL READINGS:**

- Aspelund K., (2010), *Design Process*, Fairchild Publication. USA.
- Bryant Michele W., DeMers Diane (2005), *The Spec Manual* 2nd Edition, Fairchild Books.
- Jaeil Lee, Camille Steen, (2019), *Technical Sourcebook For Apparel Designers*, Bloomsbury
- Sarkar Prasanta, (2015), *Garment Manufacturing: Processes, Practices and Technology, Online Clothing Study*
- *Tech Pack Book For Fashion: Clothing design sketchbook Journal for fashion designers* (2021), Independently published

### **SUGGESTED READINGS:**

- Frings G., (2007), *Fashion: From Concept to Consumer* (9th Edition). Prentice Hall. USA.
- Grace Kunz, Ruth Glock, (2004), *Apparel Manufacturing: Sewn Product Analysis* (4th Edition), Pearson
- Janace E. Bubonia, (2017), *Apparel Production Terms and Processes*, Fairchild Books; 2nd edition
- Seivewright S., Sorger R, (2016), *Research and Design for Fashion*, New York: Fairchild Books
- Tain L. (2018), *Portfolio Presentation for Fashion Designers*, New York: Fairchild Books

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**B.A (Prog.) with Apparel Design and Construction (ADC) as Major**  
**Category-II**

**DISCIPLINE SPECIFIC CORE COURSE – DSC-8-ADC:  
INTRODUCTION TO FASHION AND GARMENT INDUSTRY**

**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 Fashion and Garment industry	4	3	0	1	Class XII	NIL

**Learning Objectives:**

- To provide an understanding of the concepts related to Fashion and Garment Industry.
- To introduce garment design concepts and their application
- To apprise the learners of the social aspects of clothing
- To provide an overview of the structure of Indian garment industry and to create an awareness of the various fashion centres of the world and their leading designers and brands.

**Learning Outcomes:**

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

- Define and describe fashion related basic terms and concepts.
- Illustrate and explain the stages of a fashion cycle curve.
- Identify fashion consumers belonging to different phases of the fashion cycle.
- Describe the theories of fashion adoption.
- Explain the various sources of fashion and design inspirations.
- Explain the elements and principles of design with examples drawn from garment design.
- Explain the various theories of origin and functions of clothing.
- List the major fashion centres of the world and their leading designers and brands.
- Describe the various factors influencing the spread of fashion
- Explain the role and responsibilities of a fashion designer
- Illustrate garments or components such as necklines, sleeves, tops and collars, skirts, trousers, etc.
- Illustrate select garments on a fashion croqui using basic rendering techniques.

**SYLLABUS OF DSC-8**

**THEORY**  
**(Credits 3; Hours 45)**

**UNIT – 1: Terms and concepts related to Fashion**

**15 Hours**

This unit introduces the learners to the various terms and concepts related to Fashion

- Fashion terms: Fashion, Fad, Classic, Style, Haute-couture, Mass fashion, Fashion Label, Prêt-a-porter, Knockoff, Accessory, Atelier, Boutique, Avant Garde, Empire line, Season, Slow and Fast Fashion, Fashion Forecasting
- Fashion Concepts:
  - Fashion cycle
  - Consumer identification with fashion life cycle – fashion leaders, fashion followers, fashion victims, fashion laggards
  - Theories of Fashion adoption – trickle down, trickle up, trickle across
  - Factors favouring and retarding the spread of fashion
  - Sources of fashion research - printed and electronic media, web resources, historic/traditional costumes, travel, fabrics, nature, street, architecture, awareness

## **UNIT – 2: Design Concepts and Clothing**

**15 Hours**

This unit provides an understanding of the use of various elements and principles of design in garment designing. It also provides an understanding of the various functions of clothing and theories about its origin.

- Elements and principles of design and their use in creating well designed garments.
- Body Shapes and their design requirements
- Theories of origin of clothing, Functions of clothing
- Clothing Terminology

## **Unit - 3: Fashion and Garment Industry**

**15**

### **Hours**

This unit provides an overview of the structure of Indian garment industry. It also aims to apprise the learners to the various fashion centres of the world and their leading designers and brands.

- Structure and status of the Indian Readymade Garment Industry
- Overview of the different departments of Garment Industry and their respective functions
- Role and responsibilities of a Fashion Designer
- Major fashion centers of the world and their leading designers and fashion labels/brands - Paris, Milan, Tokyo, New York, London, India

### **PRACTICAL (Credits 1; Hours 30)**

1. Development of flat sketches and technical drawings of various garment components, and their style variations– Necklines, Collars, Sleeves, Skirts, Pants, Dresses
2. Illustration of select garments on Fashion Croqui. Basic fabric rendering techniques.
3. Collection of garment images and Style Reading to describe various garments and their parts
4. Analysis of the use of elements and principles of design in garment design.

**ESSENTIAL READINGS:**

- Frings G. (2013). *Fashion-From Concept to Consumer* (9th Edition). USA: Prentice Hall Publications.
- N. Gokarneshan, (2019), *Garment Manufacturing Technology*, Abhishek Publications
- Stone E., Farnan, Sheryl A. (2023). *The Dynamics of Fashion*. New York: Fairchild Publication.
- Tate Sharon, (2006), *Inside Fashion Design*, Pearson Education India

**SUGGESTED READINGS:**

- Abhing Bina, (2019), *Fashion Sketch Book* (7th edition), Fairchild Books
- Irina V Ivanova, (2016), *How to Draw Fashion Flats: A practical guide to fashion technical drawing (pencil and marker techniques) (Fashion Croquis)* (Volume 2)  
Art Design Project
- Marshall S G, et al. (2009). *Individuality in Clothing & Personal Appearance* (6th Edition). USA: Pearson Education
- Ilaria Caielli, (2022), *Beyond Fashion: Inside the Fashion Business*, Hoaki

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**



**B.A (Prog.) with Apparel Design and Construction (ADC) as Non-Major**  
**Category-III**

**DISCIPLINE SPECIFIC CORE COURSE – DSC-8-ADC:  
INTRODUCTION TO FASHION AND GARMENT INDUSTRY**

**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 Fashion and Garment industry	4	3	0	1	Class XII	NIL

**Learning Objectives:**

- To provide an understanding of the concepts related to Fashion and Garment Industry.
- To introduce garment design concepts and their application
- To apprise the learners of the social aspects of clothing
- To provide an overview of the structure of Indian garment industry and to create an awareness of the various fashion centres of the world and their leading designers and brands.

**Learning Outcomes:**

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

- Define and describe fashion related basic terms and concepts.
- Illustrate and explain the stages of a fashion cycle curve.
- Identify fashion consumers belonging to different phases of the fashion cycle.
- Describe the theories of fashion adoption.
- Explain the various sources of fashion and design inspirations.
- Explain the elements and principles of design with examples drawn from garment design.
- Explain the various theories of origin and functions of clothing.
- List the major fashion centres of the world and their leading designers and brands.
- Describe the various factors influencing the spread of fashion
- Explain the role and responsibilities of a fashion designer
- Illustrate garments or components such as necklines, sleeves, tops and collars, skirts, trousers, etc.
- Illustrate select garments on a fashion croqui using basic rendering techniques.

**SYLLABUS OF DSC-8**

**THEORY**  
**(Credits 3; Hours 45)**

## **UNIT – 1: Terms and concepts related to Fashion**

**15 Hours**

This unit introduces the learners to the various terms and concepts related to Fashion

- Fashion terms: Fashion, Fad, Classic, Style, Haute-couture, Mass fashion, Fashion Label, Prêt-a-porter, Knockoff, Accessory, Atelier, Boutique, Avant Garde, Empire line, Season, Slow and Fast Fashion, Fashion Forecasting
- Fashion Concepts:
  - Fashion cycle
  - Consumer identification with fashion life cycle – fashion leaders, fashion followers, fashion victims, fashion laggards
  - Theories of Fashion adoption – trickle down, trickle up, trickle across
  - Factors favouring and retarding the spread of fashion
  - Sources of fashion research - printed and electronic media, web resources, historic/traditional costumes, travel, fabrics, nature, street, architecture, awareness

## **UNIT – 2: Design Concepts and Clothing**

**15 Hours**

This unit provides an understanding of the use of various elements and principles of design in garment designing. It also provides an understanding of the various functions of clothing and theories about its origin.

- Elements and principles of design and their use in creating well designed garments.
- Body Shapes and their design requirements
- Theories of origin of clothing, Functions of clothing
- Clothing Terminology

## **UNIT - 3: Fashion and Garment Industry**

**15 Hours**

This unit provides an overview of the structure of Indian garment industry. It also aims to apprise the learners to the various fashion centres of the world and their leading designers and brands.

- Structure and status of the Indian Readymade Garment Industry
- Overview of the different departments of Garment Industry and their respective functions
- Role and responsibilities of a Fashion Designer
- Major fashion centers of the world and their leading designers and fashion labels/brands - Paris, Milan, Tokyo, New York, London, India

### **PRACTICAL (Credits 1; Hours 30)**

1. Development of flat sketches and technical drawings of various garment components, and their style variations– Necklines, Collars, Sleeves, Skirts, Pants, Dresses
2. Illustration of select garments on Fashion Croqui. Basic fabric rendering techniques.
3. Collection of garment images and Style Reading to describe various garments and their parts
4. Analysis of the use of elements and principles of design in garment design.

**ESSENTIAL READINGS:**

- Frings G. (2013). *Fashion-From Concept to Consumer* (9th Edition). USA: Prentice Hall Publications.
- N. Gokarneshan, (2019), *Garment Manufacturing Technology*, Abhishek Publications
- Stone E., Farnan, Sheryl A. (2023). *The Dynamics of Fashion*. New York: Fairchild Publication.
- Tate Sharon, (2006), *Inside Fashion Design*, Pearson Education India

**SUGGESTED READINGS:**

- Abling Bina, (2019), *Fashion Sketch Book* (7th edition), Fairchild Books
- Irina V Ivanova, (2016), *How to Draw Fashion Flats: A practical guide to fashion technical drawing (pencil and marker techniques) (Fashion Croquis)* (Volume 2)  
Art Design Project
- Marshall S G, et al. (2009). *Individuality in Clothing & Personal Appearance* (6th Edition). USA: Pearson Education
- Ilaria Caielli, (2022), *Beyond Fashion: Inside the Fashion Business*, Hoaki

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**DEPARTMENT OF HOME SCIENCE**  
**SEMESTER – V**

**B.A (Prog.) with Apparel Design and Construction (ADC) as  
Major  
Category-II**

**DISCIPLINE SPECIFIC CORE COURSE – DSC-9-ADC:  
APPAREL QUALITY MANAGEMENT**

**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		
Apparel Quality Management	4	3	1	0	Class XII	NIL

**Learning Objectives:**

- To introduce the learners to the concept of Quality and Quality management in the apparel industry.
- To provide an understanding of quality control practices in apparel manufacturing in the pre-production, production and post – production stages.

**Learning Outcomes:**

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

- Describe the dimensions of quality and components of quality management.
- Identify and differentiate the various quality standards applicable to the apparel industry.
- Describe the process of inspection and testing of the raw material at the pre-production stage of apparel manufacturing.
- Identify and explain the various pattern and marker defects, spreading defects, cutting defects, sewing and seam defects, pressing and finishing defects
- Correctly measure ready garments such as shirt, trousers, t-shirt, skirt
- Describe the common garment tests for checking its functionality and durability
- Evaluate the ready garment for its overall appearance, workmanship and against the specific requirements of the buyer/ client

**SYLLABUS OF DSC-9**

**THEORY**  
**(Credits 3; Hours 45)**

**UNIT I: Introduction to Quality and Quality Management**

**5 Hours**

This unit provides an understanding of the concepts relating to quality and quality management in the apparel industry. It also aims to apprise the learners of the various quality standards and specifications applicable to the garment industry.

- Quality and Quality Management – Definition and importance, Dimensions of Quality, Components of Quality management – Quality Planning, Quality Assurance, Quality Control
- Quality Standards and Specifications – Importance and types, National and International Standards

## **UNIT II: Quality Control in Apparel Manufacturing: Pre-production Stage                      10 Hours**

This unit provides basic understanding of the quality control practices in apparel manufacturing in the pre-production stages.

- Fabric Inspection and Testing – Inspection machines/Equipment, Grading of fabric - 4 point and 10 point system, Fabric Testing – Need and Importance, Physical Tests, Color fastness tests
- Accessories Inspection – Interlining, Sewing thread, Zipper, Buttons

## **UNIT III: Quality Control in Apparel Manufacturing: Production Stage                      15 Hours**

This unit provides basic understanding of the quality control practices in apparel manufacturing in the production stages.

- Pattern and marker defects, Spreading defects, Cutting defects, sewing and seam defects, Pressing and finishing defects
- Key Inline checkpoints for standard Garment Types

## **UNIT IV: Quality Control in Apparel Manufacturing: Post-production Stage                      15 Hours**

This unit provides basic understanding of the quality control practices in apparel manufacturing in the post-production stages.

- Garment Measuring - Shirt, Trouser, T-Shirt, and Skirt
- Garment Testing for functionality, durability, safety
- Evaluation on the basis of overall appearance, workmanship, specific requirements of the buyer/ client
- Sampling Plans, AQL

### **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 READINGS:**

- B. Purushothama, (2021), *Handbook of Managing Apparel Production and Quality*, Woodhead Publishing India Pvt Ltd
- Pradip V. Mehta, (2012), *Quality Management Handbook For The Apparel Industry*, New Age International Private Limited
- Sara J. Kadolph, (2007), *Quality Assurance for Textiles and Apparel*, Fairchild Books

**SUGGESTED READINGS:**

- Janace E. Bubonia, (2014), *Apparel Quality: A Guide to Evaluating Sewn Products*, Fairchild Books
- Mehta & Bharadwaj, (1998), *Managing Quality in Apparel Industry*, New Age Publisher, Delhi
- J.E. Booth, (1996), *Principles of Textile Testing*, CBS Publishers & Distributors Pvt. Ltd.

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**DISCIPLINE SPECIFIC CORE COURSE – DSC-10-ADC:  
GARMENT PRODUCTION**

**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		
Garment Production	4	3	1	0	Class XII	NIL

**Learning Objectives:**

- To provide an overview of the functions and processes of various departments of a Garment production unit.
- To create an understanding of the garment production systems and the role of time and motion studies in productivity.

**Learning Outcomes:**

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

- Describe the Steps and strategies involved in the sourcing of fabrics and trims for garment production.
- Explain the role of Marker making, Marker Modes, Marker efficiency in garment production.
- Explain the processes involved in spreading, layout and cutting
- Identify and describe the function of general and specialised sewing machines, types of machine beds and related seams and stitches
- Explain the processes used in finishing and packing department.

- Compare and evaluate the alternative systems of production.
- Explain the importance of time and motion studies to improve productivity in garment production.

## **SYLLABUS OF DSC-10**

### **THEORY (Credits 3; Hours 45)**

#### **UNIT – 1: Sourcing of fabrics and trims**

**10 Hours**

This unit aims at providing a basic understanding of the steps involved in sourcing of raw materials required for garment production.

- Role and Functions of sourcing department
- Steps and strategies of sourcing – Commercial and technical specification of the required fabrics and trims, types of sources, finalisation of vendors and order placement

#### **UNIT 2: Spreading, Marker making and Cutting Hours**

**10**

This unit provides an understanding of the various equipment and processes used in marker making, spreading, layout and cutting room.

- Marker Making – Marker making and fabric consumption, Marker Modes, Marker efficiency
- Spreading and Layout – Spreading methods, Spreading Machines, Splicing, Fabric (Symmetrical and asymmetrical), Types of Lay
- Cutting Room – Cutting room workflow, Cut order planning, Cutting equipment, Fabric Reconciliation

#### **UNIT – 3: Sewing, Finishing and Packing department**

**15 Hours**

This unit provides an understanding of the various equipment and processes used in sewing, finishing and packing department.

- Sewing Room – Functions of sewing department, General and specialised sewing machines, Seams and stitches
- Finishing Department - Functions of finishing department, finishing equipment, types of pressing, washing and dry cleaning, Stain and dry removal, Types of folds, Folding equipment and accessories
- Packing department – Packing and packing material, types of packing, packing list

#### **UNIT 4 – Production Systems and Productivity**

**10 Hours**

This unit introduces the concept of Production systems and time and motion studies in garment production.

- Production systems: Make through system, Section or process system, Whole Garment Production System, Assembly Line System, Bundle system and PBS, Straight line or synchro, Unit production system, Modular Production System
- Role of time and motion study in the productivity of garment production.

## **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 READINGS:**

- N. Gokarneshan, (2019), *Garment Manufacturing Technology*, Abhishek Publications
- Gerry Cooklin, Steven George Hayes, John McLoughlin, (2006), *Introduction to Clothing Manufacture*, Wiley-Blackwell
- Shukla Atul, Tyagi Dharmendra, (2023), *Productivity Improvement in Garment Manufacturing Process*, LAP Lambert Academic Publishing
- T Karthik, (2016), *Apparel Manufacturing Technology*, Taylor and Francis

### **SUGGESTED READINGS:**

- Eiri Staff, (2007), *Hand Book of Garments Manufacturing Technology*, Educa Books
- Jaeil Lee, Camille Steen, (2019), *Technical Sourcebook For Apparel Designers*, Bloomsbury
- Jung Ha-Brookshire, (2017), *Global Sourcing in the Textile and Apparel Industry*, Bloomsbury Publishing Plc
- Sarkar Prasanta, (2015), *Garment Manufacturing: Processes, Practices and Technology*, Online Clothing Study

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**



**B.A (Prog.) with Apparel Design and Construction (ADC) as Non-Major**  
**Category-III**

**DISCIPLINE SPECIFIC CORE COURSE – DSC-10-ADC:  
GARMENT PRODUCTION**

**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		
Garment Production	4	3	1	0	Class XII	NIL

**Learning Objectives:**

- To provide an overview of the functions and processes of various departments of a Garment production unit.
- To create an understanding of the garment production systems and the role of time and motion studies in productivity.

**Learning Outcomes:**

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

- Describe the Steps and strategies involved in the sourcing of fabrics and trims for garment production.
- Explain the role of Marker making, Marker Modes, Marker efficiency in garment production.
- Explain the processes involved in spreading, layout and cutting
- Identify and describe the function of general and specialised sewing machines, types of machine beds and related seams and stitches
- Explain the processes used in finishing and packing department.
- Compare and evaluate the alternative systems of production.
- Explain the importance of time and motion studies to improve productivity in garment production.

**SYLLABUS OF DSC-10**

**THEORY**  
**(Credits 3; Hours 45)**

**UNIT – 1: Sourcing of fabrics and trims**

**10 Hours**

This unit aims at providing a basic understanding of the steps involved in sourcing of raw materials required for garment production.

- Role and Functions of sourcing department
- Steps and strategies of sourcing – Commercial and technical specification of the required fabrics and trims, types of sources, finalisation of vendors and order placement

## **UNIT 2: Spreading, Marker making and Cutting**

**10 Hours**

This unit provides an understanding of the various equipment and processes used in marker making, spreading, layout and cutting room.

- Marker Making – Marker making and fabric consumption, Marker Modes, Marker efficiency
- Spreading and Layout – Spreading methods, Spreading Machines, Splicing, Fabric (Symmetrical and asymmetrical), Types of Lay
- Cutting Room – Cutting room workflow, Cut order planning, Cutting equipment, Fabric Reconciliation

## **UNIT – 3: Sewing, Finishing and Packing department**

**15 Hours**

This unit provides an understanding of the various equipment and processes used in sewing, finishing and packing department.

- Sewing Room – Functions of sewing department, General and specialised sewing machines, Seams and stitches
- Finishing Department - Functions of finishing department, finishing equipment, types of pressing, washing and dry cleaning, Stain and dry removal, Types of folds, Folding equipment and accessories
- Packing department – Packing and packing material, types of packing, packing list

## **UNIT 4 – Production Systems and Productivity**

**10 Hours**

This unit introduces the concept of Production systems and time and motion studies in garment production.

- Production systems: Make through system, Section or process system, Whole Garment Production System, Assembly Line System, Bundle system and PBS, Straight line or synchro, Unit production system, Modular Production System
- Role of time and motion study in the productivity of garment production.

## **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 READINGS:**

- N. Gokarneshan, (2019), *Garment Manufacturing Technology*, Abhishek Publications
- Gerry Cooklin, Steven George Hayes, John McLoughlin, (2006), *Introduction to Clothing Manufacture*, Wiley-Blackwell
- Shukla Atul, Tyagi Dharmendra, (2023), *Productivity Improvement in Garment Manufacturing Process*, LAP Lambert Academic Publishing
- T Karthik, (2016), *Apparel Manufacturing Technology*, Taylor and Francis

**SUGGESTED READINGS:**

- Eiri Staff, (2007), *Hand Book of Garments Manufacturing Technology*, Educa Books
- Jaeil Lee, Camille Steen, (2019), *Technical Sourcebook For Apparel Designers*, Bloomsbury
- Jung Ha-Brookshire, (2017), *Global Sourcing in the Textile and Apparel Industry*, Bloomsbury Publishing Plc
- Sarkar Prasanta, (2015), *Garment Manufacturing: Processes, Practices and Technology*, Online Clothing Study

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**DEPARTMENT OF HOME SCIENCE**  
**Semester – VI**

**BA (Prog.) with Apparel Design and Construction (ADC) as Major**  
***Category-II***

**DISCIPLINE SPECIFIC CORE COURSE – DSC-11-ADC:  
ADVANCED PATTERN MAKING AND CLOTHING CONSTRUCTION**

**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		
Advanced Pattern Making and Clothing Construction	4	2	0	2	Class XII	Pass in DSC-4-ADC Basic Pattern Making and Clothing Construction

**Learning Objectives:**

- To enhance the knowledge and skills of learners in advanced concepts related to Pattern Making and Clothing Construction
- To familiarise the students about the concepts related to the handling of extra special fabrics
- To develop pattern making and construction skills for various advanced garments and their components
- To impart skills for developing design and size variations through draping and Grading

**Learning Outcomes:**

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

- Apply draping principles to develop patterns
- Use grading techniques to develop different pattern sizes.
- Develop paper patterns for men and women.
- Describe the 2D and 3D applications of CAD software in Garment designing and pattern development
- List the sequence of the Garment Assembly process
- Evaluate the fit of garment and its components and carry out pattern alteration as required.

**SYLLABUS OF DSC-11**

**THEORY**  
**(Credits 2; Hours 30)**

**UNIT I: Garment Fit and Role of CAD in Designing and Pattern development**

**10 Hours**

This unit provides an understanding of the advanced techniques of pattern making. It also introduces the learners to the use of CAD in pattern development.

- Garment fit: Evaluating fit of garment and its components, standards and methods of pattern alteration, pattern alterations for fitting problems
- Introduction to the role of Computer Aided Designing (CAD): 2D and 3D applications of CAD software in Garment designing and pattern development

## **UNIT II: Introduction to Draping and Pattern Grading**

**10 Hours**

This unit introduces the learners to the concepts of draping and pattern grading.

- Draping: Draping Technique, Principles of Draping, Tools and dress forms used for Draping, Fabric preparation, Demonstration of draping technique, Converting draped patterns to commercial patterns on paper
- Pattern Grading: Definition, features, terminology, Principles and methods, Demonstration of Grading

## **UNIT III: Handling of special fabrics and Garment Assembly**

**10 Hours**

This unit provides an understanding of handling advanced special fabrics. It also helps to understand the sequence of garment assembly.

- Handling of fabrics with reference to designing, layout, marking, cutting, stitching, needle sizes, stitch sizes, threads used, seams and other special considerations – Brocade, Corduroy, Denim, Embroidered fabric, Net and tulle, Delicate fabrics, Stretch fabric, Terry cloth, Fleece.
- Garment Assembly: Steps in assembling Shirt, Skirt

### **PRACTICAL (Credits 2; Hours 60)**

1. Pattern Making:
  - Dart manipulation for contouring
  - Advanced design variations of garment components
2. Garment Construction:
  - Reversible Garment
  - Evening/ Formal Wear

### **ESSENTIAL READINGS:**

- Abling Bina, Maggio Kathleen, (2019), *Integrating Draping, Drafting and Drawing*, Fairchild Books
- Armstrong, H.J., (2009), *Pattern Making for Fashion Design*, Harper Collins Publishers Inc., New York.
- Kim Injoo, Myoung Ok Kim, Zachary Hoh, (2022), *Apparel Design through Patternmaking*, Fairchild Books

- Liechty Elizabeth, Rasband Judith, Pottberg-Steineckert Della, (2016), *Fitting and Pattern Alteration: A Multi-Method Approach to the Art of Style Selection, Fitting, and Alteration*, Fairchild Books
- Shaeffer Claire, (2003), *Sew any Fabric*, Krause Publications
- Theresa Parker, (2012), *Draping for Fashion Design*, The Crowood Press Ltd

#### SUGGESTED READINGS:

- Gerry Cooklin, (2008), *Pattern Grading for Women's Clothes*, OM Books
- Jennifer Lynne Matthews-Fairbanks, Dawn Marie Forsyth, (2018), *Pattern Design: Fundamentals: Construction and Pattern Making for Fashion Design*, Create Space Independent Publishing Platform
- Kathy K. Mullet, (2015), *Concepts of Pattern Grading: Techniques for Manual and Computer Grading*, Fairchild
- Macdonald Nora M., (2009), *Principles of Flat-Pattern Design*, Fairchild Books, New York.
- Sarah Veblen, (2012), *The Complete Photo Guide to Perfect Fitting*, Quarry Books
- Mahon Joi, (2022), *Ultimate Illustrated Guide to Sewing Clothes: A Complete Course on Making Clothing for Fit and Fashion*, Landauer Publishing

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

### DISCIPLINE SPECIFIC CORE COURSE – DSC-12-ADC: APPAREL MARKETING AND MERCHANDISING

#### 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		
Apparel Marketing & Merchandising	4	3	0	1	Class XII	NIL

#### Learning Objectives:

- To introduce the learners to the principles of apparel marketing.
- To create an understanding of the fashion trend forecasting process.
- To impart basic knowledge relating to apparel merchandising in garment industry and retail.

#### Learning Outcomes:

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

- Explain the role and application of the 4 Ps in apparel marketing
- List and explain the importance and methods of market segmentation, targeting and positioning
- Explain the process of fashion forecasting and compare qualitative and quantitative methods of forecasting.
- Describe the role and functions of a merchandiser in garment industry and retail.

## **SYLLABUS OF DSC-12**

### **THEORY (Credits 3; Hours 45)**

#### **UNIT – 1: Fundamentals of Apparel Marketing**

**20 Hours**

This unit introduces the students to the concepts of marketing as applied to apparels

- Marketing Concept, Marketing Mix - 4Ps of Marketing
- Product - Product classification, Product mix, product life cycle and marketing strategies; Branding and brand attributes
- Price - Factors affecting price, Methods of price fixation
- Place - Channels of distribution, Factors affecting Channels of distribution
- Promotion – Advertising, Publicity, Personal selling, Sales promotion
- Market: Segmentation, Targeting & Positioning, Advantages and types of market segmentation

#### **UNIT 2: Fashion Trend Forecasting**

**10 Hours**

This unit imparts basic knowledge of fashion trend forecasting.

- Function and process of Forecasting
- Long term and short term forecasting
- Qualitative and Quantitative forecasting
- Sources of Fashion Forecasting Information

#### **UNIT – 3: Basics of Apparel Merchandising**

**15 Hours**

This unit provides an understanding of the role and functions of a merchandiser in garment industry and retail

- Concept of merchandising
- Merchandising Process
- Apparel retail – Meaning, retail formats
- Role of a merchandiser in garment Industry
- Role of a merchandiser in apparel retail
- Merchandise Category-Staple, Fashion & Seasonal; Assortment Planning

### **PRACTICAL (Credits 1; Hours 30)**

1. Study of Fashion forecast: Development of mood boards & theme boards depicting colour, silhouettes & detailing, material & textures, print & graphics, accessories
2. Case study of an apparel brand- signage, logo, tagline, positioning, target market, product mix
3. Comparative survey of Apparel Retail stores
4. Development of Promotional material – Brand, Logo, Visiting card, Print advertisement, Shopping bag

**ESSENTIAL READINGS:**

- Kotler P and Armstrong G. (2017). *Principles of Marketing* (17th Edition). New Delhi: Prentice Hall of India
- Krishnakumar, M., (2010), *Apparel Merchandising, An integrated Approach*, Abishek Publications
- Mary G. Wolfe, (2017), *Fashion Marketing & Merchandising*, Goodheart-Willcox Pub
- Stone Elaine, Farnan Sheryl A., (2023), *The Dynamics of Fashion*, Fairchild Books
- V. Ramesh Babu (Author), A. Arunraj, (2019), *Fashion Marketing Management*, Woodhead Publishing India Pvt Ltd

**SUGGESTED READINGS:**

- Harriet Posner, (2015), *Marketing Fashion*, Laurence King Publishing
- Olga Mitterfellner, (2019), *Fashion Marketing and Communication: Theory and Practice Across the Fashion Industry*, Routledge
- Wendy K. Bendon, (2017), *Social Media for Fashion Marketing: Storytelling in a Digital World*, Fairchild Books

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**B.A (Prog.) with Apparel Design and Construction (ADC) as Non-Major  
Category-III**

**DISCIPLINE SPECIFIC CORE COURSE – DSC-12-ADC:  
APPAREL MARKETING AND MERCHANDISING**

**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		
Apparel Marketing & Merchandising	4	3	0	1	Class XII	NIL

**Learning Objectives:**

- To introduce the learners to the principles of apparel marketing.
- To create an understanding of the fashion trend forecasting process.
- To impart basic knowledge relating to apparel merchandising in garment industry and retail.

**Learning Outcomes:**

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

- Explain the role and application of the 4 Ps in apparel marketing
- List and explain the importance and methods of market segmentation, targeting and positioning
- Explain the process of fashion forecasting and compare qualitative and quantitative methods of forecasting.



- Describe the role and functions of a merchandiser in garment industry and retail.

## **SYLLABUS OF DSC-12**

### **THEORY (Credits 3; Hours 45)**

#### **UNIT – 1: Fundamentals of Apparel Marketing**

**20 Hours**

This unit introduces the students to the concepts of marketing as applied to apparels

- Marketing Concept, Marketing Mix - 4Ps of Marketing
- Product - Product classification, Product mix, product life cycle and marketing strategies; Branding and brand attributes
- Price - Factors affecting price, Methods of price fixation
- Place - Channels of distribution, Factors affecting Channels of distribution
- Promotion – Advertising, Publicity, Personal selling, Sales promotion
- Market: Segmentation, Targeting & Positioning, Advantages and types of market segmentation

#### **UNIT 2: Fashion Trend Forecasting**

**10 Hours**

This unit imparts basic knowledge of fashion trend forecasting.

- Function and process of Forecasting
- Long term and short term forecasting
- Qualitative and Quantitative forecasting
- Sources of Fashion Forecasting Information

#### **UNIT – 3: Basics of Apparel Merchandising**

**15 Hours**

This unit provides an understanding of the role and functions of a merchandiser in garment industry and retail

- Concept of merchandising
- Merchandising Process
- Apparel retail – Meaning, retail formats
- Role of a merchandiser in garment Industry
- Role of a merchandiser in apparel retail
- Merchandise Category-Staple, Fashion & Seasonal; Assortment Planning

### **PRACTICAL (Credits 1; Hours 30)**

1. Study of Fashion forecast: Development of mood boards & theme boards depicting colour, silhouettes & detailing, material & textures, print & graphics, accessories
2. Case study of an apparel brand- signage, logo, tagline, positioning, target market, product mix
3. Comparative survey of Apparel Retail stores
4. Development of Promotional material – Brand, Logo, Visiting card, Print advertisement, Shopping bag

**ESSENTIAL READINGS:**

- Kotler P and Armstrong G. (2017). *Principles of Marketing* (17th Edition). New Delhi: Prentice Hall of India
- Krishnakumar, M., (2010), *Apparel Merchandising, An integrated Approach*, Abishek Publications
- Mary G. Wolfe, (2017), *Fashion Marketing & Merchandising*, Goodheart-Willcox Pub
- Stone Elaine, Farnan Sheryl A., (2023), *The Dynamics of Fashion*, Fairchild Books
- V. Ramesh Babu (Author), A. Arunraj, (2019), *Fashion Marketing Management*, Woodhead Publishing India Pvt Ltd

**SUGGESTED READINGS:**

- Harriet Posner, (2015), *Marketing Fashion*, Laurence King Publishing
- Olga Mitterfellner, (2019), *Fashion Marketing and Communication: Theory and Practice Across the Fashion Industry*, Routledge
- Wendy K. Bendon, (2017), *Social Media for Fashion Marketing: Storytelling in a Digital World*, Fairchild Books

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

## **DEPARTMENT OF HOME SCIENCE**

**B.A (Prog.) with Apparel Design & Construction (ADC)**

**Pool of Discipline Specific Elective Courses (DSE) for Odd Semester**

**B.A (Prog.) with Apparel Design and Construction (ADC)**

*Category-V*

### **DISCIPLINE SPECIFIC ELECTIVE COURSE DSE-1-ADC: INDIAN TEXTILES CRAFTS**

**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		
Indian Textile Crafts	4	3	1	0	Class XII Pass	NIL

#### **Learning Objectives:**

To create an understanding and appreciation of the various traditional Indian textile crafts such as needle crafts, dyeing and printing techniques, and weaving of sarees and shawls.

#### **Learning Outcomes:**

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

- Explain briefly the origin, history, speciality and popularity of the needle crafts of India such as Toda, Chamba Rumal, Lambada, Sindhi, Suf embroidery of Kutchh
- Explain briefly the origin, history, speciality and popularity of the dyed, painted and printed textiles of India such as Kalamkari, Thangka, Pichhwai, Ajrakh, Dabu
- Explain briefly the origin, history, speciality and popularity of the woven saris and shawls of India such as Brocades, Chanderi and Maheshwari, Kota, Paithani, Kanjeevarams, Kasavu, Kashmir Shawl, Kullu Shawl, Wraps of North-east
- List the specific regions of the country having a concentration of artisans practising different types of traditional textile crafts.
- Identify the various types of traditional needle craft, traditional dyeing, painting and printing techniques and traditional woven saris and shawls of India.

#### **SYLLABUS OF DSE-1-ADC**

**THEORY  
(Credits 3; Hours 45)**

## Unit I: Traditional Needle-Craft Techniques

10 Hours

This unit provides an understanding of the origin of technique and design with reference to colours, stitches and motifs of different embroidered textiles.

- Study of traditional Indian needle craft techniques with reference to History, production centres, techniques, design, Motifs, Color combination, Type of thread used, Stitches: Toda, Chamba Rumal, Lambada, Sindhi, Suf embroidery of Kutchh

## Unit II: Dyed, Painted and Printed Textiles

15 Hours

This unit provides basic knowledge of resist dyeing textile techniques of India in terms of process, production centres, colours, patterns and layout

- Study of Indian Dyed, painted and printed textiles with reference to History, production centres, techniques, designs and colours: Kalamkari, Thangka, Pichhwai, Ajrakh, Dabu

## Unit III: Woven Saris and Shawls of India

20 Hours

This unit provides basic knowledge of the origin of technique and design with reference to colours, motifs, layouts of different hand-woven saris of India

- Study of woven saris and shawls of India with reference to History, production centres, techniques, motifs, designs and colours: Brocades, Chanderi and Maheshwari, Kota, Paithani, Kanjeevarams, Kasavu, Kashmir Shawl, Kullu Shawl, Wraps of North-east

### 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 READINGS

- Dhamija J., (1989), *Hand-woven fabrics of India*, Ahmedabad: Mapin Publishing Pvt ltd
- John Gillow, Nicholas Barnard, (2014), *Indian Textiles*, Om books International, New Delhi.
- Naik S, (1996), *Fabric Art- Heritage of India*, Abhinav Publications
- Shailaja D. Naik, (1996), *Traditional Embroideries of India*, A.P.H. Publishing Corporation, New Delhi

### SUGGESTED READINGS

- Chattopadhyaya, K.D. (1995), *Handicrafts of India*, New Delhi: Wiley Eastern Limited
- Neumann Helmut, Neumann Heidi, Crill Rosemary, (2020), *Textiles of India*, Prestel
- Sheila Paine, (1990), *Embroidered Textiles*, Thames and Hudson Ltd.
- Shah Archana, (2021), *Crafting a Future: Stories of Indian Textiles and Sustainable Practices*, Niyogi Books

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**B.A (Prog.) with Apparel Design and Construction (ADC)**

**Category-V**

**DISCIPLINE SPECIFIC ELECTIVE COURSE  
DSE-3-ADC: APPAREL RETAIL AND E-TAIL**

**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		
Apparel Retail and E-tail	4	3	1	0	Class XII Pass	NIL

**Learning Objectives:**

- To provide an overview of Indian apparel retail and e-tail scenario.
- To create an understanding of basic marketing and operations of apparel retail and e-tail stores.

**Learning Outcomes:**

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

- List the important structural changes and emerging trends in the Indian apparel retail sector.
- Describe the unique aspects of apparel retail and e-tail
- Classify the different types of retail outlets.
- Compare the 4 Ps and 4Cs of retail and e-tail marketing mix
- Describe the main operational processes of retail and e-tail stores
- Compare the strengths & weaknesses of apparel retail & e-tail from the vendor and consumer points of view
- Identify the different types of e-tailing business models

**SYLLABUS OF DSE-3-ADC**

**THEORY  
(Credits 3; Hours 45)**

**UNIT I: Overview of Apparel Retailing**

**5 Hours**

This unit provides an overview of the Indian apparel retail scenario. It also provides classification of retail formats and stores.

- Overview of Indian apparel retail – Definition of Retail & Retailer, Special features of apparel retailing, Organised and unorganized retailing, Retail evolution in India: structural changes and emerging trends
- Strengths & weaknesses of apparel retail from vendor and customer points of view

- Classification of Retail Formats/ Stores – Types of Formats (in-store and non-store), Type of Stores (ownership and merchandise based)

## **UNIT II: Retail Marketing and Operations**

**10 Hours**

This unit provides basic understanding of the concepts related to marketing and operation of retail stores.

- 4Ps of marketing - Product – merchandise assortment and inventory management; Place – Store Management, store location, Floor layout; Promotion – in-store and off-store promotion and advertising; Pricing strategy
- Retail Store Operations - Store Management (Store procedures, premises maintenance, Legal compliance); Customer management (Approaching and assisting the customer, Transaction flow system, Handling returns and exchanges, Following up on sales, Dealing with customers' grievances)

## **UNIT III: Overview of Apparel E-tailing**

**15 Hours**

This unit provides an overview of the Indian apparel e-tail scenario. It also introduces the learners to categories of e-business models.

- Overview of Indian apparel e-tail - Indian apparel e-tail scenario, Uniqueness of apparel in e-tail, Steps involved in e-tailing, Types of fashion e-tail outlets
- Strengths & weaknesses of apparel e-tail from vendor and customer points of view
- Types of e-business: B2B, B2C, C2C, C2B, B2G, G2B, G2C
- Broad categories of e-commerce implementation strategies - Retail Model, Brokerage Model, Mall Model, Drop Shipping Model, Warehousing and Whole selling Model, Private Labelling, and White Labelling Models
- E-commerce revenue models: advertising, affiliate, Transaction Fee Revenue, sales revenue

## **UNIT IV: E-tail Marketing and Operations**

**15 Hours**

This unit provides basic understanding of the concepts related to marketing and operation of e-tail stores.

- 4Ps Vs 4Cs of e-tail marketing mix
- E-commerce store-fronts
- Essentials of e-tail operations - Customer acquisition, supply-chain and delivery, Pricing strategy, customer service, returns and refunds, financial transaction, legal compliance, data privacy and security

## **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 READINGS:**

- Joseph P. T., (2019), *E-Commerce: An Indian Perspective*, New Delhi: PHI Learning
- Levy Michael, Weitz Barton A., Grewal Dhruv, (2021), *Retailing Management*. US: Irwin Publishers
- McMahon John, (2017), *E-commerce A Beginners Guide to e-commerce*, Createspace Independent Publishing Platform
- Whiteley D. (2017). *E-Commerce: Strategy, Technologies and Applications*. New York: McGraw Hill Education

**SUGGESTED READINGS:**

- Dunn Patrick, Lusch Robert, Griffith David A., (2002), *Retailing*, USA: Harcourt College Publishers
- Chaffey D. (2013). *E-Business and E-Commerce Management: Strategy, Implementation and Practice* (5th edition). New Delhi: Pearson Education India
- Laudon C., Traver C. (2018). *E-Commerce 13th Edition*. Pearson

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**B.A (Prog.) with Apparel Design and Construction (ADC)**

***Category-V***

**DISCIPLINE SPECIFIC ELECTIVE COURSE  
DSE-5-ADC: FASHION COMMUNICATION AND MEDIA**

**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		
Fashion Communication and Media	4	2	0	2	Class XII Pass	NIL

**Learning Objectives:**

To provide an understanding of the different types of media used in Fashion communication

**Learning Outcomes:**

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

- Describe the social aspect of clothing
- List and explain the 7Cs of communication
- Compare the characteristics of different types of media
- Describe the nature and application of various elements of fashion communication

**SYLLABUS OF DSE-5-ADC**

**THEORY  
(Credits 2; Hours 30)**

**UNIT I: Concepts of Fashion and Communication**

**5 Hours**

This unit provides an overview of the fashion concept relevant to media communication.

- Social aspects of Fashion and clothing – Communication through clothing
- Communication – Function and types of communication
- 7Cs of Communication

**UNIT II: Concepts related to Media**

**5 Hours**

This unit provides understanding of the importance and types of communication and media

- Characteristics, significance and types of print, electronic and web based media
- Importance of media in fashion industry



### UNIT III: Elements of Fashion Communication

20 Hours

This unit provides an understanding of the elements of fashion communication and related aspects.

- Importance, impact, types, methods and tools, and related professions:
  - Fashion Journalism
  - Fashion Photography
  - Fashion Broadcasting and Fashion Films
  - Fashion Visual Merchandising
  - Fashion Styling
  - Fashion Advertising
  - Fashion Events
  - Fashion Blogging and Vlogging
  - Graphic Design for Fashion

#### **PRACTICAL** **(Credits 2; 60 Hours)**

1. Preparation of an article/Blog for publication in print media/ web media
2. Creation of a Video Blog of a fashion event/ news
3. Study of editorial photography of a fashion magazine
4. Development of print and web advertisement layout for selected fashion brand.
5. Comparative survey of window displays of fashion stores
6. Preparation of a press release for a fashion event
7. Content creation for Social Media

#### **ESSENTIAL READINGS:**

- Guntasha K. Tulsi, Nidhi Madan, (2022), *Media and Communication: A Handbook of Students*, Worldview Publications
- Jay, Phyllida (2015) *Fashion India*, Thames and Hudson, London.
- Lascity Myles Ethan, (2021), *Communicating Fashion: Clothing, Culture, and Media*, Bloomsbury Visual Arts

#### **SUGGESTED READING:**

- Anand, S. & Kumar, A. (2016). *Dynamics of Human Communication*. New Delhi: Orient Black Swan. ISBN: 9788125063254
- Greenwood, G. L. (2012) *Fashion Marketing Communications*, John Wiley and Sons
- Jade, L. (2012) *Fashion Photography 101, A Complete Course for the New Fashion Photographers*, Hachette UK

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

## **DEPARTMENT OF HOME SCIENCE**

### **B.A (Prog.) with Apparel Design & Construction (ADC) Pool of Discipline Specific Elective Courses (DSE) for Even Semester Category-V**

#### **DISCIPLINE SPECIFIC ELECTIVE COURSE DSE-2-ADC: FASHION EVENT MANAGEMENT**

#### **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		
Fashion Event Management	4	3	1	0	Class XII Pass	NIL

#### **Learning Objectives:**

- To create an understanding of the different types of fashion events and the planning required for their successful organisation.
- To familiarise the students with the various practical steps involved in the organisation of fashion events and their proper coordination
- To develop practical knowledge of the administrative, designing, planning, marketing, operational and risk management aspects of fashion events through project work.

#### **Learning Outcomes:**

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

- List the types and components of fashion events
- Create an initial event plan covering theme, duration, target audience and budget
- Prepare a checklist for venue related activities and their management
- Describe the steps required for successfully staging the fashion event
- Explain the process of marketing the event and mobilising sponsorships
- State the legal compliance and safety requirements
- Describe the role of themes, target audience and media communication in successful fashion shows
- List the logistics arrangements and personnel requirements of a fashion show
- Prepare a checklist of the organisational requirements of a fashion show

#### **SYLLABUS OF DSE-2-ADC**

##### **THEORY (Credits 3; Hours 45)**

##### **UNIT I: Understanding and Planning Fashion Events**

**10 Hours**

This unit introduces the students to the types of fashion events and their planning requirements.

- Types, categories and Principles of Event Management

- Types of fashion events – fashion show, fairs & trade show, product launch
- Role of an event coordinator - Administration, Design, Marketing, Operations, Risk
- Creating an event plan
- Initial Planning Requirements: Creating themes, targeting the audience /vendors, Timing the event, Finding a venue, Guest lists and Invitations, Team organisation, preparing duty charts, Budget estimation, seeking sponsorships

## **UNIT II: Designing & Executing Fashion Show**

**20 Hours**

This unit creates an understanding of the various steps in the organisation of fashion shows.

- Venue requirements: Stage design, Seating plan, Lighting and allied audio-visual effects, Programme Booklet, Catering arrangements, Progress monitoring through checklists
- Catwalk Presentation Requirements: Merchandise selection, Models selection, Music and choreography, Final show sequence and rehearsals, Fitting sessions, Dressing area arrangements, Commentary requirements, Closing and striking the show

## **UNIT III: Marketing & Managing Fashion events**

**15 Hours**

This unit helps in understanding the various aspects related to promoting, managing and analysing fashion events

- Creating a pre and post-event promotion plan; preparing press release and media kit
- Post Show Evaluation
- Ensuring Legal Compliance, Safety & Security: Licenses and permissions to be obtained, Risk Management for prevention of hazards, Security for people and merchandise

### **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 READINGS:**

- Everett C., Swanson K. (2018). *Guide to Producing a Fashion Show* (3rd Edition). New York: Bloomsbury Publications.
- Silvers J. (2012). *Professional Event Coordination* (2<sup>nd</sup> Edition). New Jersey: Wiley.
- Ukaegbu Raymond, (2023), *Essentials of Fashion Show Production*, Goloko Diaries

### **SUGGESTED READINGS:**

- Berners P. (2017). *The Practical Guide to Organizing Events*. UK: Taylor & Francis Publisher.
- Robinson P., Dikson G., Wale D. (2010). *Event Management: An Introduction*. CAB International.
- Taylor P. (2012). *How to Produce a Fashion Show from A to Z*. New Jersey: Pearson Prentice Hall.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**B.A (Prog.) with Apparel Design and Construction (ADC)**

**Category-V**

**DISCIPLINE SPECIFIC ELECTIVE COURSE  
DSE-4-ADC: ENTREPRENEURSHIP IN FASHION**

**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		
Entrepreneurship in Fashion	4	3	1	0	Class XII Pass	NIL

**Learning Objectives:**

To provide an understanding of entrepreneurship and setting up a fashion business

**Learning Outcomes:**

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

- Describe the essential Qualities of an Entrepreneur
- Follow the steps required for setting up a business
- Identify the sources of funding
- List the Entrepreneurship promotion schemes and institutional support
- Identify business opportunities in the fashion sector.
- Describe the challenges specific to the clothing businesses.

**SYLLABUS OF DSE-4-ADC**

**THEORY  
(Credits 3; Hours 45)**

**UNIT I: Introduction to Entrepreneurship**

**10 Hours**

This unit provides an overview of the concept of entrepreneurship.

- Entrepreneurship: Concept, Functions and Importance
- Essential Qualities of an Entrepreneur; Types of Entrepreneur
- Types of entrepreneurship
- Role of creative and innovative problem-solving in entrepreneurship

**UNIT II: Setting up a new Enterprise**

**20 Hours**

This unit provides basic understanding of the steps to be followed in the setting up a business.

- Idea Generation: Tools and techniques for idea generation
- Setting up an enterprise: Basic steps, Feasibility study, Components and Preparation of business plan
- Resource Requirements: Financial, Human, Technical, Marketing, Legal and other Resources

- Funding sources – Traditional and modern
- Marketing Channels

### UNIT III: Promotional Schemes and Resources

15 Hours

This unit provides an overview of the Entrepreneurship promotion schemes and resources. It also provides an understanding of the opportunities and challenges of fashion businesses.

- Entrepreneurship promotion schemes and resources of Government and Financial Institutions
- Role of incubation centres in enterprise creation and development
- Important terms and concepts: Intellectual Property (IP) rights, Trademark, Copyright, Patent, Design, Trade secret, Investment, Turnover
- Business opportunities in the Fashion sector – Boutique Owner, Apparel store, Fashion label, Contract Manufacturer, Fashion event management, Garment exporter, Online retail
- Challenges in Clothing business – High inventory holding and costs, Heavy rate of returns, Fast fashion, Sustainability issues, High customer acquisition cost, varied customer segments

### 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 READINGS:

- Aarathi Gunnupuri, (2016), *Start Up Your Fashion Label*, Collins
- Charantimath Poornima M., (2018), *Entrepreneurship Development and Small Business Enterprises*. Pearson Education India
- Gupta O. P., Gupta Vijay, Gupta Santosh, (2021), *Fundamentals Of Entrepreneurship*, SBPD Publishing House
- Sharma Sangeeta, (2017), *Entrepreneurship Development* New Delhi: PHI Learning Private Limited
- Harvard Business Review, (2018), *Harvard Business Review Entrepreneur's Handbook*, Harvard Business Review Press

### SUGGESTED READING:

- Andrea Siracuse, (2020), *Voguepreneurs: Women Entrepreneurs Who Have Built Million Dollar Brands Through Digital Platforms*, New Degree Press
- Nath Dhruv, Mitra Sushanto, (2020), *Funding Your Startup and Other Nightmare*, Penguin Portfolio
- Cameron Brewer, (2021), *How to Start a Clothing Company - Deluxe Edition Learn Branding, Business, Outsourcing, Graphic Design, Fabric, Fashion Line Apparel, Shopify, Fashion, Social Media, and Instagram*, Ramtander Ltd

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**B.A (Prog.) with Apparel Design and Construction (ADC)**

**Category-V**

**DISCIPLINE SPECIFIC ELECTIVE COURSE  
DSE-6-ADC: 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	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- 6- ADC**

**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* 4<sup>th</sup> 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* 1<sup>st</sup> Ed. New Age International Pvt Ltd, New Delhi.
- Kumar, R. (2019) *Research Methodology: A Step-by-Step Guide for Beginners*. 5<sup>th</sup> 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](https://www.ugc.ac.in/e-book/Academic%20and%20Research%20Book_WEB.pdf)

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**



## **Department of Home Science**

### **Pool of Generic Elective Courses (GE)**

#### **B.A (Prog.) with Apparel Design and Construction (ADC)**

#### **GENERIC ELECTIVE COURSE – GE-1-ADC: APPAREL DESIGN AND CONSTRUCTION**

#### **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		
Apparel Design & Construction	4	2	0	2	Class XII Pass	NIL

#### **Learning Objectives:**

To familiarise the students with the terminologies and concepts related to apparel design and its construction

#### **Learning Outcomes:**

- After completing this course, the learner will be able to:
- Define the basic sewing and pattern making terminologies
- Describe and use the tools used for measuring, drafting, pinning, marking and cutting, sewing and pressing.
- Explain the steps and processes used in Clothing construction
- List the different parts of a sewing machine and their functions
- Identify the causes of working defects of sewing machines and suggest their remedies
- State the apparel categories
- Take body measurements correctly
- List and describe the factors influencing designing garments for different seasons, age groups, occasions & profession
- Classify fibre types and list examples
- Describe the basic processes of dyeing and printing fabrics.
- Do basic hand stitches such as basting, hemming, back stitch and running
- Make use of basic seams for constructing garments
- Construct a few women's garment using the direct method of cutting fabrics and sewing.
- Use tie and dye technique to design an article.

## **SYLLABUS OF GE-1-ADC**

### **THEORY (Credits 2; Hours 30)**

#### **UNIT I: Apparel Design and Pattern Development**

**10 Hours**

This unit introduces the students to classification of apparels and concepts related to design and development of garment patterns.

- Apparel Classification
- Body measurements – Correct procedure of taking body measurements.
- Methods of pattern development: Drafting, Flat pattern making, Draping
- Garment designing according to age, climate, occasion, occupation

#### **UNIT II: Introduction to Textiles**

**8 Hours**

This unit provides basic understanding of textile fibres and fabrics.

- Common Fibre types – natural and man-made
- Introduction to methods of fabric construction – woven, knitted, non-woven
- Fabric Glossary of commonly available fabrics
- Common methods of dyeing and printing – tie & Dye, Block Printing

#### **UNIT III: Introduction to Apparel Construction**

**12 Hours**

This unit imparts knowledge regarding terms, equipment and processes connected with apparel construction.

- Common terms: Apparel, basting, seam finishing, Dart, Gathers, Seam allowance, Pattern, Grading, Notch, Stay stitching, Yoke, Gusset, Basic blocks
- Fabric grain- types, identification and importance in apparel construction
- Tools and equipment required for measuring, drafting, pinning, marking and cutting, sewing, pressing
- Steps in clothing construction- pre-shrinking, grain straightening, layout, pinning, marking, cutting, sewing, pressing
- Main parts of a sewing machine and their functions, Common sewing problems & remedies, care of machine, safety measures to be taken while sewing

**PRACTICAL**  
**(Credits 2; Hours 60)**

1. Basic hand stitches – basting, hemming, back stitch, running
2. Seams – plain seam, French seam, Top-stitching
3. Preparation of body measurement chart for self.
4. Construction by direct method: (any one in each category)
  - Women's upper garment – Kameez/ kurti/ Blouse
  - Lower garment – Palazzo/ Petticoat/ skirt
5. Tie and Dye samples – Stripes, Tritik, folds, knots
6. Preparation of an article by tie and dye

**ESSENTIAL READING:**

- Armstrong H. (2009). *Pattern Making for Fashion Design*. New York: Collins Publishers.
- Colton V. (1995). *Reader's Digest- Complete Guide to Sewing*. New York: The Reader's Digest Association, Inc.
- Joseph M.L. (1988). *Essentials of Textiles* (5th Edition). Florida: Rinehart and Winston Inc.
- Marshall S G, et al. (2009). *Individuality in Clothing & Personal Appearance* (6th Edition). USA: Pearson Education

**SUGGESTED READING:**

- Amita, A. Stamper A., et al. (2005). *Evaluating Apparel Quality*. New York: Fairchild publications
- Kindersley D. (1992). *The Complete Book of Sewing*. London: Dorling Kindersley Limited.
- Sinclair R. (2015). *Textiles and Fashion: Materials, Design and Technology*. New York: Woodhead Publishing Limited.
- Verma, P. (2003). *Vastra Vigyan Evam Paridhan*. Bhopal: Hindi Granth Academy
- Zarapkar K. R. (2017). *System of Cutting*. New Delhi: Navneet Education (India) Limited.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**B.A (Prog.) with Apparel Design and Construction (ADC)**

**GENERIC ELECTIVE COURSE – GE-2-ADC:  
APPRECIATION OF INDIAN TEXTILE CRAFTS**

**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		
Appreciation of Indian Textile Crafts	4	3	1	0	Class XII Pass	NIL

**Learning Objectives:**

To create an understanding and appreciation of the various traditional Indian textile crafts such as needle crafts, dyeing and printing techniques, and weaving of sarees and shawls.

**Learning Outcomes:**

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

- Explain briefly the origin, history, speciality and popularity of the needle crafts of India such as Kashida, Kasuti, Kantha, Chikankari, Kutch work and Phulkari
- Explain briefly the origin, history, speciality and popularity of the dyed, painted and printed textiles of India such as Kalamkari, Bandhani, Ikats, Pichwais, Ajrakh and Bagru.
- Explain briefly the origin, history, speciality and popularity of the woven saris and shawls of India such as Brocades, Jamdani, Baluchar, Paithani, Chanderi and Kanjeevarams.
- List the specific regions of the country having a concentration of artisans practising different types of traditional textile crafts.
- Identify the various types of traditional needle craft, traditional dyeing, painting and printing techniques and traditional woven saris and shawls of India.

**SYLLABUS OF GE-2-ADC**

**THEORY  
(Credits 3; Hours 45)**

**UNIT I: Traditional Needle-Craft Techniques**

**10 Hours**

This unit provides an understanding of the origin of technique and design with reference to colours, stitches and motifs of different embroidered textiles.

- Study of traditional Indian needle craft techniques with reference to History, production centres, techniques, design, Motifs, Color combination, Type of thread used, Stitches: Kashida, Kasuti, Kantha, Chikankari, Phulkari and Bagh

## **UNIT II: Dyed, Painted and Printed Textiles**

**15 Hours**

This unit provides basic knowledge of resist dyeing textile techniques of India in terms of process, production centres, colours, patterns and layout

- Study of Indian Dyed, painted and printed textiles with reference to History, production centres, techniques, designs and colours: Kalamkari, Bandhani, Ikat and Patola, Ajrakh

## **UNIT III: Woven Saris and Shawls of India**

**20 Hours**

This unit provides basic knowledge of the origin of technique and design with reference to colours, motifs, layouts of different hand-woven saris of India

- Study of woven saris and shawls of India with reference to History, production centres, techniques, motifs, designs and colours: Brocades, Jamdani, Baluchar, Chanderi, Kanjeevarams, Kashmir Shawl, Kullu Shawl, Wraps of North-east

### **TUTORIALS (Credits 1; Hours 15)**

Tutorial classes will involve:

5. Q&A sessions/ Group discussions/ Problem Solving exercises with the Students
6. Presentation of project/ research activity by students
7. Any other scholastic work related to application of conceptual understanding of the subject.
8. Evaluation and feedback by the teacher

### **ESSENTIAL READINGS**

- Naik S, (1996), *Fabric Art- Heritage of India*, Abhinav Publications
- Shailaja D. Naik, (1996), *Traditional Embroideries of India*, A.P.H. Publishing Corporation, New Delhi
- John Gillow, Nicholas Barnard, (2014), *Indian Textiles*, Om books International, New Delhi.
- Dhamija J., (1989), *Hand-woven fabrics of India*, Ahmedabad: Mapin Publishing pvt ltd

### **SUGGESTED READINGS**

- Crill R., Murphy M. (1991). *Tie-dyed Textiles of India*. London: Victoria and Albert museum.
- Desai C. (1988). *Ikat textiles of India*. San Francisco: Chronical Books
- Sheila Paine, "Embroidered Textiles", Thames and Hudson Ltd., 1990.
- Chattopadhyaya, K.D. (1995). *Handicrafts of India*. New Delhi: Wiley Eastern Limited Das S.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**B.A (Prog.) with Apparel Design and Construction (ADC)**

**GENERIC ELECTIVE COURSE – GE-3-ADC:  
UNDERSTANDING FASHION DESIGN**

**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		
Understanding Fashion Design	4	2	0	2	Class XII Pass	NIL

**Learning Objectives:**

To provide an understanding of the concepts related to Fashion and Garment Design and Development.

**Learning Outcomes:**

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

- Define and describe fashion related basic terms and concepts.
- Illustrate and explain the stages of a fashion cycle curve.
- Identify fashion consumers belonging to different phases of the fashion cycle.
- Describe the theories of fashion adoption.
- Explain the elements and principles of design with examples drawn from garment design.
- List the major fashion centres of the world and their leading designers
- Describe the basic steps of design and development process
- Explain the role and responsibilities of a fashion designer
- Illustrate garments or components such as necklines, sleeves, tops and collars, skirts, trousers, etc.
- Illustrate select garments on a fashion croqui using basic rendering techniques.

**SYLLABUS OF GE-3-ADC**

**THEORY  
(Credits 2; Hours 30)**

## **UNIT – 1: Terms and concepts related to Fashion**

**10 Hours**

This unit introduces the learners to the various terms and concepts related to Fashion

- Fashion terms: Fashion, Fad, Classic, Style, Haute-couture, Mass fashion, Fashion Label, Prêt-a-porter, Knockoff, Accessory, Atelier, Boutique, Avant Garde, Empire line, Season, Slow and Fast Fashion, Fashion Forecasting
- Fashion Concepts:
  - Fashion cycle
  - Fashion leaders, fashion followers, fashion victims, fashion laggards
  - Theories of Fashion adoption – trickle down, trickle up, trickle across

## **UNIT – 2: Application of Design Concepts in Clothing**

**10 Hours**

This unit provides an understanding of the use of various elements and principles of design in garment designing. It also provides an understanding of the various functions of clothing and theories about its origin.

- Elements and principles of design and their use in creating well designed garments.
- Body Shapes and their design requirements
- Clothing Terminology

## **UNIT - 3: Design and Development Process**

**10 Hours**

This unit provides an overview of the steps in the Design and Development process. It also aims to apprise the learners to the various fashion centres of the world and their leading designers.

- Basic Steps in the Design and Development process: Ideation and inspiration research, Mood board/theme board development, Design Development, Flat and technical drawings, Design finalization based on feedback and improvement, Specification sheet, Fabric Sourcing, Sample development, Design approval, Production
- Role and responsibilities of a Fashion Designer
- Major fashion centers of the world and their leading designers - Paris, Milan, Tokyo, New York, London, India

### **PRACTICAL (Credits 2; 60 Hours)**

1. Development of flat sketches of various garment components, and their style variations – Necklines, Collars, Sleeves, Skirts, Pants, Dresses
2. Illustration of select garments on Fashion Croqui.
3. Collection of garment images and their Style Reading
4. Analysis of the use of elements and principles of design in garment design.

### **ESSENTIAL READINGS:**

- Frings G. (2013). *Fashion-From Concept to Consumer* (9th Edition). USA: Prentice Hall Publications.
- Stone E., Farnan, Sheryl A. (2023). *The Dynamics of Fashion*. New York: Fairchild Publication.
- Tate Sharon, (2006), *Inside Fashion Design*, Pearson Education India

#### **SUGGESTED READINGS:**

- Abling Bina, (2019), *Fashion Sketch Book* (7th edition), Fairchild Books
- Irina V Ivanova, (2016), *How to Draw Fashion Flats: A practical guide to fashion technical drawing (pencil and marker techniques) (Fashion Croquis)* (Volume 2)  
Art Design Project
- Marshall S G, et al. (2009). *Individuality in Clothing & Personal Appearance* (6th Edition). USA: Pearson Education

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**



**B.A (Prog.) with Apparel Design and Construction (ADC)**

**GENERIC ELECTIVE COURSE - GE-4-ADC:  
FASHION ACCESSORIES DESIGN**

**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		
Fashion Accessories Design	4	2	0	2	Class XII Pass	NIL

**Learning Objectives:**

- To give the learners an overview of the accessory design and development process
- To develop the skills required for creating and restyling fashion accessories.
- To impart the basic knowledge about styles and production techniques of select fashion accessories.

**Learning Outcomes:**

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

- State the importance of fashion accessories.
- Describe the role of an accessory designer
- Describe the Common styles, materials used and production of handbags, footwear, Jewellery, Belts, Hats
- Provide a brief description of the sources of design inspiration and research.
- Describe the various steps in the accessory design development process.
- Explain how to design development is used for creating an accessory range.
- Use illustration and rendering techniques for designing fashion accessories.
- Adopt restyling techniques creatively for making accessories through recycling
- Create a theme/inspiration based accessory collection.

**SYLLABUS OF GE-4-ADC**

**THEORY  
(Credits 2; Hours 30)**

**UNIT I: Importance of Fashion Accessories**

**8 Hours**

This unit introduces the students to role and importance of accessories and accessory designer.

- Importance of accessories in fashion industry
- Role of an accessory designer
- Leading contemporary accessory designers and brands

## **UNIT II: Understanding Fashion Accessories**

**12 Hours**

This unit creates an understanding of the common styles, production methods of common fashion accessories.

- Common style, materials used and the production methods of common accessories: Handbags, Footwear, Jewellery, Belt, Hats

## **UNIT III: From Concept to Creation: Key Steps in Accessories Design**

**10 Hours**

This unit provides an overview of steps in the designing of an accessories collection/ range.

- Inspiration and Research
- Trend forecasting of fashion accessories
- Design development
- Developing a theme-based range
- Presentation techniques

### **PRACTICAL (Credits 2; 60 Hours)**

1. Illustrating fashion accessories - Handbag, Footwear, Jewellery
2. Designing and construction of any one fashion accessory
3. Restyling project- Restyling of plain accessories using creative techniques
4. Final Project- Based on an inspiration, designing a collection of accessories on paper.

### **ESSENTIAL READING:**

- Darla-Jane Gilroy, (2023), *Fashion Bags and Accessories: Creative Design and Production*, Laurence King Publishing
- Diamond E. (2007). *Fashion Apparel, Accessories, and Home Furnishings*. New Jersey: Pearson.
- Fringes S. (2007). *Fashion: From Concept to Consumer* (9th Edition). New Jersey: Prentice Hall
- Jarnow J. (1987). *Inside the Fashion Business*. New Jersey: Pearson.
- Lau J. (2012). *Basics Fashion Design 09: Designing Accessories: Exploring the design and construction of bags, shoes, hats and jewellery*. New York: A Publishing

**SUGGESTED READING:**

- Gervail O. (2010), Fashion Accessories. USA: Firefly Books publisher
- Peacock J. (2000). Fashion Accessories: The Complete 20th Century Sourcebook., London: Thames & Hudson Publisher
- Marshall S., Jackson H., Stanley S. (2011). Individuality in Clothing Selection and Personal Appearance (7th Edition). New Jersey: Pearson.
- Vilaseca E. (2008). Essential Fashion Illustration: Color and Medium. USA: Rockport Publishers

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

## B.A (Prog.) with Apparel Design and Construction (ADC)

### GENERIC ELECTIVE COURSE - GE-5-ADC: FASHION AND MEDIA

#### 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		
Fashion and Media	4	2	0	2	Class XII Pass	NIL

#### Learning Objectives:

To provide an understanding of the different types of media used in Fashion communication

#### Learning Outcomes:

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

- Describe the common fashion related concepts.
- List and explain the 7Cs of communication
- Compare the characteristics of different types of media
- Describe the nature and application of various elements of fashion communication

#### SYLLABUS OF GE-5-ADC

#### THEORY (Credits 2; 30 Hours)

##### UNIT I: Fashion Concepts

7 Hours

This unit provides an overview of the fashion concept relevant to media and communication.

- Social aspects of Fashion and clothing – Communication through clothing
- Terms and concepts related to fashion – Fashion, Style, Fashion Cycle, Fashion adoption, Fashion movement, Fashion brands and designers

##### UNIT II: Communication and Media

5 Hours

This unit provides understanding of the importance and types of communication and media

- Communication – Function and types of communication, 7Cs of Communication
- Characteristics, significance and types of print, electronic and web based media

- Importance of media in fashion industry

### **UNIT III: Elements of Fashion Communication**

**18 Hours**

This unit provides an understanding of the elements of fashion communication and related aspects.

- Importance, impact, types, methods and tools, and related professions:
  - Fashion Journalism
  - Fashion Photography
  - Fashion Broadcasting and Fashion Films
  - Fashion Visual Merchandising
  - Fashion Styling
  - Fashion Advertising
  - Fashion Events
  - Fashion Blogging and Vlogging
  - Graphic Design for Fashion

### **PRACTICAL (Credits 2; 60 Hours)**

8. Preparation of an article/Blog for publication in print media/ web media
9. Creation of a Video Blog of a fashion event/ news
10. Study of editorial photography of a fashion magazine
11. Development of print and web advertisement layout for selected fashion brand.
12. Comparative survey of window displays of fashion stores
13. Preparation of a press release for a fashion event
14. Content creation for Social Media

### **ESSENTIAL READINGS:**

- Guntasha K. Tulsi, Nidhi Madan, (2022), *Media and Communication: A Handbook of Students*, Worldview Publications
- Jay, Phyllida (2015) *Fashion India*, Thames and Hudson, London.
- Lascity Myles Ethan, (2021), *Communicating Fashion: Clothing, Culture, and Media*, Bloomsbury Visual Arts

### **SUGGESTED READING:**

- Anand, S. & Kumar, A. (2016). *Dynamics of Human Communication*. New Delhi: Orient Black Swan. ISBN: 9788125063254
- Greenwood, G. L. (2012) *Fashion Marketing Communications*, John Wiley and Sons
- Jade, L. (2012) *Fashion Photography 101, A Complete Course for the New Fashion Photographers*, Hachette UK

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**B.A (Prog.) with Apparel Design and Construction (ADC)**

**GENERIC ELECTIVE COURSE - GE-6-ADC:  
FASHION STYLING**

**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		
Fashion Styling	4	2	0	2	Class XII Pass	NIL

**LEARNING OBJECTIVES:**

- To provide an understanding of the different aspects of fashion styling that suit different occasions
- To create an awareness of the body types and the art of selecting styles that improve the overall visual appeal.

**LEARNING OUTCOMES:**

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

- Explain the psychological and sociological influences of clothing.
- Assess the personality and personal style preferences
- Select suitable clothing based on season, body types, occasions
- Use elements and principles of design effectively in garment designing and illusion dressing.
- Prepare wardrobe plans
- Coordinate clothing with accessories

**SYLLABUS OF GE-6-ADC**

**THEORY  
(Credits 2; 30 Hours)**

**UNIT I: Basics of Fashion and Styling**

**8 Hours**

This unit introduces the students to role and importance of accessories and accessory designer.

- Effect of clothing on Self-Concept & Image and social response
- Introduction to fashion - Types of fashion (Haute couture, Ready-to-wear fashion, Mass market, Custom-tailored), Classics, Fads, Fashion cycles, Fashion trends
- Fashion styles: Casual/ street wear, Business casual, Office formal, Chic, Bohemian, Ethnic/traditional, Vintage, Artsy, Gothic, Professional, Sporty, Classic, Feminine, Modest and Minimalist.

**UNIT II: Concepts of Garment Design and Accessories**

**14 Hours**

This unit introduces the learner to various styles of garments and accessories and familiarises them with the application of elements and principles of design for dressing up an individual.

- Garment style terminology - women's and men's wear.
- Elements and Principles of Design and their application in garment designing.
- Dressing up according to season and occasion
- Characteristic features and design requirements of various body types.
- Accessory styles – Handbags, Footwear, Scarves; Accessory coordination with clothing

### **UNIT III: Wardrobe Planning**

**8 Hours**

This unit helps in understanding the various aspects of wardrobe planning and execution

- Factors influencing wardrobe planning
- Wardrobe evaluation, organization and categorization
- Capsule wardrobe – Importance, types and planning for self

#### **PRACTICAL (Credits 2; 60 Hours)**

1. Analysis of self-image, personality and fashion style for self
2. Development of a Fashion and accessory style board for an individual, for different occasions based on body types
3. Presentation of a wardrobe plan for self/ an individual
4. Analysis of the use of elements and principles of design in any garment

### **ESSENTIAL READINGS:**

- Stone, E., (2023), *The Dynamics of Fashion*, Fairchild Books
- Brown, P., & Janett, R. (1998), *Ready to Wear Apparel Analysis*. Prentice Hall, New Jersey.
- Frings, Stephens, G., 2007, *Fashion: From Concept to Consumer*, 9th edition, Pearson Education, India.
- Stall-meadows, C. (2003), *Know your Fashion Accessories*, Bloomsbury Publishing.
- Rasband, J. (2001), *Wardrobe Strategies for Women*, Fairchild Books, Bloomsbury Publishing.
- Romano, C. (2002), *Plan your Wardrobe*, New Holland Publishers.

### **SUGGESTED READINGS:**

- Baumgartner, J. (2012), *You are What You Wear*, Da Capo Press.
- Constantine, S. & Woodall, T. (2007), *The Body Shape Bible: Forget Your Size Discover Your Shape Transform Yourself*, Weidenfeld & Nicolson
- Lewis S.D. et al. (1956), *Clothing Construction & Wardrobe Planning*, Macmillan Co. New York.
- Sumathi, G. J., (2002), *Elements of Fashion and Apparel Design*, New Age International Publishers, New Delhi.
- Aneta G. (2011), *Accessory Design*, Fairchild Publications, 1<sup>st</sup> edition
- Jane S., & Sue S. (2012), *Fashion Design Course: Accessories: Design Practice and Processes for Creating Hats, Bags, Shoes, and More*, Barron's Educational Series

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**Department of Home Science**  
**Semester -IV**  
**B.A. (Prog) with Food Technology (FT) as Major**  
***Category-II***

**DISCIPLINE SPECIFIC CORE COURSE – DSC-7-FT:  
INTRODUCTION TO FOOD SAFETY**

**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		
Introduction to Food Safety	4	3	0	1	Class XII	NIL

**LEARNING OBJECTIVES:**

1. To impart knowledge on basic concepts of food safety.
2. To familiarize the students about common physical, chemical and biological contamination of food.
3. To help students understand the basics of surveillance and sustainability in food processing.

**LEARNING OUTCOMES:**

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

1. Explain food safety, principles of hygiene and factors which compromise food safety
2. Appreciate the role of surveillance and sustainability while ensuring food safety
3. Handle food with responsibility
4. Facilitate safe food handling by fellow colleagues in food processing unit

**SYLLABUS OF DSC-7-FT**

**THEORY**  
**(Credits 3: 45 Hours)**

**UNIT I: Unit I: Introduction to Food Safety (15 Hours)**

- *Unit Description:* This unit will introduce the students to the concept of food safety and hygiene as well as safety related challenges faced while ensuring processing and handling of food.
- *Subtopics:*
  - Importance of food safety and key terms
  - Factors affecting food safety
  - Emerging concerns of food safety
  - General principles of food hygiene

**UNIT III: Biological Hazards in Foods: Microorganisms, Spoilage and its Prevention (14 Hours)**



- *Unit Description:* This unit will help students learn and understand how different types of micro organisms can cause food spoilage which can lead to food poisoning and intoxication to the consumer.
- *Subtopics:*
  - Food hazards of biological origin- bacteria, mold, yeast, viruses and parasites
  - Factors affecting microbial growth in foods.
  - Types of food spoilage, causes and prevention (canned food, milk, water, nuts)
  - Food borne diseases- food infections and food intoxications.
  - Mycotoxins and other toxins produced in foods.

## **UNIT II: Physical and Chemical Contaminants in Foods**

**(8 Hours)**

- *Unit Description:* Contamination is an important cause of unsafe food. In this unit salient physical and chemical contaminants shall be discussed in detail. Secondary contamination shall also be dealt briefly.
- *Subtopics:*
  - Following contaminants and hazards in food and water:
    - Physical Hazards
    - Heavy Metals
    - Pesticide Residues
    - Veterinary Drug Residues
    - Packaging Residues
  - Secondary contamination

## **Unit IV: National Food Laws and Sustainability**

**(8 Hours)**

- *Unit Description:* Governance at national level for ensuring food safety from farm to the consumer's plate will be discussed in this unit. It will also introduce the concept that ensuring food safety is a responsibility which should not compromise the environment.
- *Subtopics:*
  - FSS Act and Regulations (1, 4, 5,7, 13)
  - Consumer Protection Act, 1986
  - Sustainable Hygiene Practices
  - Green Food Processing

### **PRACTICAL** **(Credits 1: 30 Hours)**

*No. of Students per Practical Class Group: 10-15*

1. Develop a checklist on food hygiene practices.
2. Conduct a survey to study the food hygiene practices in a food processing unit.
3. Develop educational aid on general principles of hygiene as recommended by WHO.
4. College Project by a group of students to maintain good hygiene in college canteen

OR

Conduct a food laboratory waste segregation activity by students and demonstration of food waste compost making unit.

5. Identification and removal of physical hazards rice grains, tea leaves, whole wheat flour and pulses.

6. Assessing the pH, TDS and hardness of potable water.
7. Checking the spoilage in milk by making use of MBRT method.
8. Assessing the microbial count by swab method for the workers and cooking surface areas of college canteen.
9. Identification of microbes/parasites by use of prepared slides and specimens.

### ESSENTIAL READINGS (Theory and Practical):

- Suri, S and Malhotra, A. (2014). *Food Science, Nutrition and Safety*. Dorling Kindersley Pvt. Ltd. (Pearson) India.
- Mathur, P. (2018). *Food Safety and Quality Control*. Orient Blackswan Private Limited.
- *The Food Safety and Standards Act along with Rules and Regulations*. (2011) Delhi: Commercial Law Publishers (India) Pvt. Ltd.
- Frazier, W.C. and Westhoff, D.C. (2014). *Food Microbiology*. Chennai: Tata McGrawHill Publishing Company Limited.
- Srivastava, S.S. (2006). *Phal Parirakshan*. Lucknow: Kitab Mahal.

### SUGGESTED READINGS:

- Boye, J.I. and Arcand, Y. (2012). *Green Technologies in Production and Processing*. First Edition. Springer Nature (USA).
- Kapoor, B., Singh, R., Kapoor, D. and Gautam, V. (2022). *Environmental Sustainability in Food Industry: A Green Perspective*. First Edition. CRC Press (USA).
- Knechtges, L.I. (2012). *Food Safety-Theory and Practice*, USA: Jones and Barlette Learning.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

## DISCIPLINE SPECIFIC CORE COURSE – DSC-8-FT: BASIC PRESERVATION TECHNOLOGY

### 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		
Basic Preservation Technology	4	3	0	1	Class XII	Nil

### LEARNING OBJECTIVES:

1. To familiarize the students with food spoilage and their causes.
2. To impart basic knowledge related to principles of food preservation.

3. To introduce the students about applications of food preservation.
4. To develop the skills of processing of chutney, sauces, fruit beverages and pickles.

## LEARNING OUTCOMES:

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

1. Describe the purpose and scope of food preservation in Indian economy
2. Explain the different objectives, principles and methods of food preservation
3. Develop safe and hygienic fruits and vegetable-based products like chutneys, sauces, beverages and pickles

## SYLLABUS OF DSC-8-FT

### THEORY (Credits 3: 45 Hours)

#### UNIT I: Scope of Food Preservation (6 Hours)

- *Unit Description:* This introductory unit focuses on the scope of food preservation and the objectives of food preservation and processing.
- *Subtopics:*
  - Scope of preservation industry in India
  - Objectives of preservation and processing

#### UNIT II: Spoilage in Preserved Products (9 Hours)

- *Unit Description:* This unit will lay emphasis on types of food spoilage in different food products as well as factors affecting food spoilage. This unit will also describe various contaminants that can result in food contamination.
- *Subtopics:*
  - Food spoilage and types
  - Causes of spoilage
  - Spoilage in different food products
  - Food contamination

#### UNIT III: Principles and Methods of Preservation (15 Hours)

- *Unit Description:* This unit will comprise of basic principles and various popular food preservation methods based on these principles.
- *Subtopics:*
  - Basic principles of food preservation
  - Basic Methods of preservation
    - Asepsis
    - Use of low temperature
    - Use of high temperature
    - Removal of moisture
    - Removal of air
    - Use of preservatives
    - Fermentation (Modification of pH)

- Irradiation
- Gas preservation
- Combination of Methods – Hurdle Technology
- Novel Preservation Techniques (HPP, PEF, Ohmic Heating, Irradiation - nomenclature only)

#### UNIT IV: Basic Fruit and Vegetable Preserved Products

(15 Hours)

- *Unit Description:* This unit will describe the preservation methods of different fruits and vegetables based processed products.
- *Subtopics:*
  - Definition, classification, preparation steps and method of preservation of following:
  - Chutneys
  - Sauces
  - Fruit beverages (with special emphasis on pasteurization, use of chemical preservatives, sugar)
  - Pickles

#### PRACTICAL (Credits 1: 30 Hours)

*No. of Students per Practical Class Group: 10-15*

1. Sterilization of bottles.
2. Market survey of preserved fruit and vegetable products
3. Development of an educational aid on food labelling
4. Preparation, bottling, sensory/objective (TSS, pH) evaluation and costing & Labelling of:
  - Sauces (chilli sauce and tomato sauce)
  - Ketchup (tomato)
  - Chutney (tomato chutney and *imli* chutney)
  - Squash (lemon squash/ orange squash, pineapple squash)
  - Syrup (rose syrup and almond syrup)
  - Fermented beverage (*Kanji*)/ value added beverages
  - Pickles (Lime, Mix Vegetable, Chilli)

#### ESSENTIAL READINGS (Theory and Practical):

- Rao, E.S., Garg, M. and Barwa, M.S.(2023). *Handbook on Processing and Preservation of Fruits and Vegetables*. 2nd edn. Variety Books Publisher's Distributors, New Delhi
- Frazier, W.C. and Westhoff, D.C. (2014). *Food Microbiology*. Chennai: Tata McGraw Hill Publishing Company Limited.
- Fellows, P.J. (2022). *Food Processing Technology Principles and Practice* (5th ed.). Woodhead Publishing Series in Food Science, Technology and Nutrition. <https://doi.org/10.1016/C2019-0-04416-0>.
- Rahman, M.S. (Ed.). (2020). *Handbook of Food Preservation* (3rd ed.). CRC Press. <https://doi.org/10.1201/9780429091483>
- Suri, S. & Malhotra, A. (2014). *Food Science Nutrition and Safety*. Delhi: Pearson India Ltd.
- Sivasankar, B. (2002). *Food Quality, in Food Processing and Preservation*. Prentice-Hall of India Private Limited, New Delhi.
- Srivastava, S.S. (2006). *Phal Parirakshan*. Lucknow: Kitab Mahal.

### SUGGESTED READINGS:

- Potter, N.N., and Hotchkiss, J.H. (2012). Food Science (5<sup>th</sup> ed.). Springer New York, NY. XV, 608. <https://doi.org/10.1007/978-1-4615-4985-7>.
- Lal, G., Siddhapa, G.S. and Tandon, G.L. (2009). *Preservation of Fruits and Vegetables*. New Delhi: Indian Council of Agriculture Research.
- Subbalakshmi, G., and Udipi, S.A. (2007). *Food Processing and Preservation*. Delhi: New Age International Publishers.
- Khurdia, D.S. (1995). *Preservation of fruits and vegetables*. New Delhi: Indian Council of Agriculture Research.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**B.A. (Prog.) with Food Technology (FT) as Non-Major  
Category-III**

**DISCIPLINE SPECIFIC CORE COURSE – DSC-6-FT:  
BASIC PRESERVATION TECHNOLOGY**

**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		
Basic Preservation Technology	4	3	0	1	Class XII	Nil

**LEARNING OBJECTIVES:**

1. To familiarize the students with food spoilage and their causes.
2. To impart basic knowledge related to principles of food preservation.
3. To introduce the students about applications of food preservation.
4. To develop the skills of processing of chutney, sauces, fruit beverages and pickles.

**LEARNING OUTCOMES:**

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

1. Describe the purpose and scope of food preservation in Indian economy
2. Explain the different objectives, principles and methods of food preservation
3. Develop safe and hygienic fruits and vegetable-based products like chutneys, sauces, beverages and pickles

**SYLLABUS OF DSC-8-FT**

**THEORY  
(Credits 3: 45 Hours)**

**UNIT I: Scope of Food Preservation (6 Hours)**

- *Unit Description:* This introductory unit focuses on the scope of food preservation and the objectives of food preservation and processing.
- *Subtopics:*
  - Scope of preservation industry in India
  - Objectives of preservation and processing

**UNIT II: Spoilage in Preserved Products (9 Hours)**

- *Unit Description:* This unit will lay emphasis on types of food spoilage in different food products as well as factors affecting food spoilage. This unit will also describe various contaminants that can result in food contamination.

- *Subtopics:*
  - Food spoilage and types
  - Causes of spoilage
  - Spoilage in different food products
  - Food contamination

### **UNIT III: Principles and Methods of Preservation**

**(15 Hours)**

● *Unit Description:* This unit will comprise of basic principles and various popular food preservation methods based on these principles.

- *Subtopics:*
  - Basic principles of food preservation
  - Basic Methods of preservation
    - Asepsis
    - Use of low temperature
    - Use of high temperature
    - Removal of moisture
    - Removal of air
    - Use of preservatives
    - Fermentation (Modification of pH)
    - Irradiation
    - Gas preservation
    - Combination of Methods – Hurdle Technology
    - Novel Preservation Techniques (HPP, PEF, Ohmic Heating, Irradiation - nomenclature only)

### **UNIT IV: Basic Fruit and Vegetable Preserved Products**

**(15 Hours)**

● *Unit Description:* This unit will describe the preservation methods of different fruits and vegetables based processed products.

- *Subtopics:*
  - Definition, classification, preparation steps and method of preservation of following:
  - Chutneys
  - Sauces
  - Fruit beverages (with special emphasis on pasteurization, use of chemical preservatives, sugar)
  - Pickles

### **PRACTICAL** **(Credits 1: 30 Hours)**

*No. of Students per Practical Class Group: 10-15*

1. Sterilization of bottles.
2. Market survey of preserved fruit and vegetable products
3. Development of an educational aid on food labelling
4. Preparation, bottling, sensory/objective (TSS, pH) evaluation and costing & Labelling of:
  - Sauces (chilli sauce and tomato sauce)

- Ketchup (tomato)
- Chutney (tomato chutney and *imli* chutney)
- Squash (lemon squash/ orange squash, pineapple squash)
- Syrup (rose syrup and almond syrup)
- Fermented beverage (*Kanji*)/ value added beverages
- Pickles (Lime, Mix Vegetable, Chilli)

### ESSENTIAL READINGS (Theory and Practical):

- Rao, E.S., Garg, M. and Barwa, M.S.(2023). *Handbook on Processing and Preservation of Fruits and Vegetables*. 2nd edn. Variety Books Publisher's Distributors, New Delhi
- Frazier, W.C. and Westhoff, D.C. (2014). *Food Microbiology*. Chennai: Tata McGraw Hill Publishing Company Limited.
- Fellows, P.J. (2022). *Food Processing Technology Principles and Practice* (5th ed.). Woodhead Publishing Series in Food Science, Technology and Nutrition. <https://doi.org/10.1016/C2019-0-04416-0>.
- Rahman, M.S. (Ed.). (2020). *Handbook of Food Preservation* (3rd ed.). CRC Press. <https://doi.org/10.1201/9780429091483>
- Suri, S. & Malhotra, A. (2014). *Food Science Nutrition and Safety*. Delhi: Pearson India Ltd.
- Sivasankar, B. (2002). *Food Quality, in Food Processing and Preservation*. Prentice-Hall of India Private Limited, New Delhi.
- Srivastava, S.S. (2006). *Phal Parirakshan*. Lucknow: Kitab Mahal.

### SUGGESTED READINGS:

- Potter, N.N., and Hotchkiss, J.H. (2012). *Food Science* (5th ed.). Springer New York, NY. XV, 608. <https://doi.org/10.1007/978-1-4615-4985-7>.
- Lal, G., Siddhapa, G.S. and Tandon, G.L. (2009). *Preservation of Fruits and Vegetables*. New Delhi: Indian Council of Agriculture Research.
- Subbalakshmi, G., and Udipi, S.A. (2007). *Food Processing and Preservation*. Delhi: New Age International Publishers.
- Khurdia, D.S. (1995). *Preservation of fruits and vegetables*. New Delhi: Indian Council of Agriculture Research.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**



**DEPARTMENT OF HOME SCIENCE**  
**Semester -V**

**B.A (PROG) WITH FOOD TECHNOLOGY (FT)**

**B.A. (Prog) with Food Technology (FT) as Major**  
***Category-II***

**DISCIPLINE SPECIFIC CORE – DSC-9-FT:**  
**FOOD PROCESSING: TECHNIQUES AND TECHNOLOGIES**

**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		
Food Processing: Techniques and Technologies	4	2	0	2	Class XII	NIL

**LEARNING OBJECTIVES:**

4. To impart theoretical and practical knowledge on basic concepts of salient techniques and technologies used in the food processing industry.
5. To familiarize the students regarding the importance of process control for ensuring efficient application of various techniques/technologies.

**LEARNING OUTCOMES:**

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

5. Appreciate the significance of using most appropriate pre-preparation and preparation techniques/technologies for processing a food product
6. Develop analytical skills pertaining to application of food processing techniques and technologies in the industry
7. Train staff associated with food handling at various levels
8. Work in food sector such as food manufacturing, packaging, sale and distribution units at mid-level positions

**SYLLABUS OF DSC-9-FT**

**THEORY**  
**(Credits 2: 30 Hours)**

**UNIT I: Introduction to material handling and pre-preparation techniques (7 Hours)**

- *Unit Description:* This unit will briefly discuss several pre-preparation techniques used in the food

industry.

- *Subtopics:*
  - Material handling during receiving and storage.
  - Cleaning of food and equipment's (dry, wet, others)
  - Separating, grading, sorting
  - Mixing, blending, binding, beating, whipping, folding, mashing, stuffing.
  - Disintegrating and grinding
  - Bleeding, singeing, flaying, trussing, de-scaling, skinning, ageing, curing, filleting.
  - Pumping, filtration, centrifugation
  - Other pre-preparation techniques: cutting, grating, peeling, stringing, soaking,

## **UNIT II: Food Processing Techniques and Technology**

**(16 Hours)**

- *Unit Description:* High temperature is popularly used while processing a variety of foods. This unit will discuss the principle, advantages, disadvantages and salient techniques, machinery required for processing food using high/low temperature, fermentation and irradiation.
- *Subtopics:*
  - High Temperature: principle (TDT, cold point), advantages, disadvantages, salient heat treatments employed in processing food (<100C, ~100C, >100C), process and heating systems – use of heat before and after packaging, ultra high-pressure systems (autoclaves, steamers and heat exchangers), canning
    - Dehydration: principle (heat mass transfer,  $a_w$ , drying curve), advantages, disadvantages, treatment of foods before and after drying, techniques (heated air/heated surface dehydrators), methods of dehydration
    - Concentration: principle, advantages, disadvantages, methods (any five)
    - Extrusion: principle, advantages, disadvantages, methods (hot paste, cold paste), extruders.
  - Low temperature: principle, advantages, disadvantages, process – treatment of foods before, during and after refrigeration/freezing, types (common or cellar storage, chilling or cold storage), types of freezing (direct and indirect contact)
  - Fermentation: principle, advantages, disadvantages, production of culture, maintaining activity of cultures, products obtained from fermentation (food products, nutrients, enzymes)
  - Irradiation: principle, advantages, disadvantages, general process

## **Unit III: Process Control and Post processing Techniques /Technologies**

**(7 Hours)**

- *Unit Description:* Process control is being recognized as an important component for enhancing efficiency and quality in food processing. This unit will discuss the significance and scope of process control as well as about packaging, storing, distribution. It will also help students learn about recent advancements in the field of food processing and packaging.
- *Subtopics:*
  - Process control – role of automation
  - Packaging techniques and technologies: passive, active, intelligent, general packaging process (assembly line)
  - Storing, distribution

- Recent advancements in food processing and packaging

**PRACTICAL**  
**(Credits 2: 60 Hours)**

*No. of Students per Practical Class Group: 10-15*

10. Learn skill (hands on experience) on various pre-preparation techniques.
11. Study/ compare quality characteristics of foods processed by using high temperature, low temperature, fermentation, irradiation or combination methods.
12. Cut-out analysis of canned food(s)
13. Survey on convenience foods available in nearby local market and identification of processing techniques used in manufacturing them.
14. Learn skill of developing food product(s) using low temperature and/or fermentation as principal method of processing and their packaging.
15. Learn skill of developing food product(s) using low temperature and/or fermentation as principal method of processing and their packaging.
16. Presentation on case study of any one processing technique or technology used traditionally in any food sector or any food industry.
17. Presentation/demonstration on innovative food processing technique or technology of a food ingredient (eg; peeling/extrusion equipment, novel technologies).

OR

Prepare an educational audio-visual aid on recent trends in food processing industry.

18. Industry visit(s)

OR

Train a group of women/students/canteen workers about any one food processing technique through demonstration of any food product that can be followed at home-based level.

**ESSENTIAL READINGS (Theory and Practical):**

- Fellows, P.J. (2022). *Food Processing Technology Principles and Practice* (5th ed.). Woodhead Publishing Series in Food Science, Technology and Nutrition. ISBN: 9780323857376. <https://doi.org/10.1016/C2019-0-04416-0>.
- Rahman, M.S. (Ed.). (2020). *Handbook of Food Preservation* (3rd ed.). CRC Press. <https://doi.org/10.1201/9780429091483>
- Sharif, Z., Mustapha, F., Jai, J., Mohd Yusof, N., and Zaki, N. (2017). Review on methods for preservation and natural preservatives for extending the food longevity. *Chemical Engineering Research Bulletin*, 19, 145–153. <https://doi.org/10.3329/ceerb.v19i0.33809>
- Suri, S., and Malhotra, A. (2014). *Food Science Nutrition and Safety*. Delhi: Pearson India Ltd.
- Potter, N.N., and Hotchkiss, J.H. (2012). *Food Science* (5<sup>th</sup>ed.). Springer New York, NY.XV, 608.<https://doi.org/10.1007/978-1-4615-4985-7>.
- Srivastava, S.S. (2006). *Phal Parirakshan*. Lucknow: Kitab Mahal.
- Sivasankar, B. (2002) *Food Quality, in Food Processing and Preservation*. Prentice-Hall of India Private Limited, New Delhi.

## SUGGESTED READINGS:

- Alyward, F.E. (1999). *Food Technology Processing and Laboratory Control*. Allied Scientific Publishers.
- Bali, P.S. (2009). *Food: Production Operations*. First Edition. Oxford University Press.
- Clark, S., Jung, S. & Buddhi. (2022). *Food Processing: Principles and Applications*. First Edition. John Wiley and Sons Inc.
- Geoffrey, C.P. (2009). *Food Science and Technology*. First Edition. Willey-Blackwell.
- Green, J.H. (2009). *Food Processing Industries*. AVI Press.
- Kumar, A. (2019). Food Preservation: Traditional and Modern Techniques. *Acta Scientific Nutritional Health* 3(12) : 45-49
- Murano, P.S. (2003). *Understanding Food Science and Technology*. First Edition. Thomsons Pvt. Ltd.
- Prasad, J. (2022). खाद्य प्रसंस्करण और सुरक्षा विषय. First Edition. Kalyani Publishers.
- Singh, M.K. (2007). *Food Processing*. First Edition. Discovery Publishing House.
- Singh, N. & Singh, I.S. (2018). *Food Science and Technology*. First Edition. Woodhead Publishing House.

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### DISCIPLINE SPECIFIC CORE – DSC-10-FT: ADVANCED BAKING TECHNOLOGY

## 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		
Advanced Baking Technology	4	2	0	2	Class XII	Basic Baking Technology

## LEARNING OBJECTIVES:

1. To impart students with knowledge related to processing of breads and Cookies.
2. To familiarize them with basics of food packaging, marketing, and cost control.

## LEARNING OUTCOMES:

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

1. Skill to prepare various kinds of breads and cookies
2. Illustrate various methods of marketing
3. Compare food packaging materials and their characteristics

4. Prepare food labels and conduct sensory evaluation of prepared baked products
5. Entrepreneurial skill related to bakery products

## SYLLABUS OF DSE-10-FT

### THEORY (Credits 2: 30 Hours)

#### UNIT I: Bread Processing (13 Hours)

- *Unit Description:* This unit describes bread processing and various spoilage occurring in bread and different bread products.
- *Subtopics:*
  - Preparation of bread - Ingredients, methods of bread dough preparation (straight, sponge, salt delayed, sour dough) steps in bread processing, evaluation of the baked bread.
  - Staling of bread, spoilage in bread and control measures.
  - Types of breads (variety of breads, pizza base, buns, dinner rolls, sourdough products).

#### UNIT II: Cookies, Biscuits and Crackers Processing (05 Hours)

- *Unit Description:* The unit will focus on processing and evaluation of cookies and crackers. It also describes the packaging, storage & labelling of the processed products.
- *Subtopics:*  
Ingredients, types, processing, storage and evaluation.
  - Cookies (Sheet, molded and dropped).
  - Biscuits
  - Crackers.

#### UNIT III: Food Packaging, Marketing and Cost Control (12 Hours)

- *Unit Description:* This unit describes the FSSAI regulations for food packaging, various food packaging materials, food marketing and cost calculation for processed baked food products.
- *Subtopics:*
  - Packaging – its importance, essential features of an ideal package, food packaging materials for baked products.
  - Food Safety and Standard (Packaging) Regulation, 2018, Food Safety and Standard (Labelling and Display) Regulation, 2020.
  - Marketing - definition and importance, marketing strategies (wholesale, retail, digital, swot and market mix) understanding the difference between marketing and sales, 4Ps of marketing (Product, Price, Place, Promotion) and distribution.
  - Cost control – cost components (material cost, labour cost and miscellaneous costs).

### PRACTICAL (Credits 2: 60 Hours)

*No. of Students per Practical Class Group: 10-15*

1. Determination of gluten content in refined wheat flour.

2. Determination of dough raising capacity (DRC) of yeast and factors affecting the yeast activity.
3. Designing labels for baked products.
4. Preparation and sensory evaluation, packaging and costing of breads:
  - White and brown bread
  - Buns
  - Dinner rolls
  - Pizza base
5. Preparation and sensory evaluation, packaging and costing of cookies:
  - Dropped cookies
  - Rolled cookies
  - Molded cookies
6. Preparing any of the baked products in bulk and organizing an exhibition-cum sale.

### ESSENTIAL READINGS (Theory and Practical):

- Dubey S. C. (2016). *Basic Baking: Science and Craft*. Delhi: The Society of Indian Bakers.
- Dubey S. C. (2009). *Bakery Vigyan*. Delhi: The Society of Indian Bakers.
- Matz A. (2008). *Bakery Technology and Engineering*. 10<sup>th</sup> Edition. Delhi: CBS Publishers.
- Kirar, I. (2021). *Textbook of Culinary and Bakery World*, I K International Publishing House Pvt Ltd.
- *Food Safety and Standards Authority of India*: <http://www.fssai.gov.in>(accessed on 17.3.2023)
- Sethi, M. (2005). *Institutional Food Management*. Delhi: New Age International Publishers.
- Food Safety and Standard (Labeling and Display) Regulation, 2020 [https://www.fssai.gov.in/upload/notifications/2020/12/5fd87c6a0f6adGazette\\_Notification\\_Labeling\\_Display\\_14\\_12\\_2020.pdf](https://www.fssai.gov.in/upload/notifications/2020/12/5fd87c6a0f6adGazette_Notification_Labeling_Display_14_12_2020.pdf) (accessed on 17.3.2023)
- Food Safety and Standard (Packaging) Regulation, 2018 [https://www.fssai.gov.in/upload/uploadfiles/files/Gazette\\_Notification\\_Packaging\\_03\\_01\\_2019.pdf](https://www.fssai.gov.in/upload/uploadfiles/files/Gazette_Notification_Packaging_03_01_2019.pdf) (accessed on 17.3.2023)

### SUGGESTED READINGS:

- Faridi, H. (2004). *The Science of Cookie and Crackers Production*. Delhi: CBS Publishers.
- Griffin, S. (1997). *Principles of Food Packaging*. Connecticut: The AVI Publishing Company.
- Khetrpal, N., Grewal, R.B., and Jood, S. (2005). *Bakery Science and Cereal Technology*. Delhi: Daya Publishing House.
- Khanna, K., Gupta, S., Seth, R., Mahana, R., and Rekhi, T. (2004). *The Art and Science of Cooking*. Delhi: Phoenix Publishing House Private Limited.
- Potter, N., and Hotchkiss, J.H. (2006). *Food Science*. Delhi: CBS Publishers.
- Raina, U., Kashyap, S., Narula, V., Thomas, S., Suvira, Vir, S., and Chopra, S. (2005). *Basic Food Preparation – A Complete Manual*. Delhi: Orient Longman.
- Sharma, S., Aggarwal, M. & Sharma, S. (2018). *Food Frontiers*. Delhi: New Delhi Publishers.
- Radhakrishnan, S. (2016). *A Guide To Baking Process*: Write And Print Publications.
- Cauvain, S.P. (2003). *Bread Making Improving Quality*: Elsevier.
- Baking courses: <https://www.udemy.com/topic/baking/>.(accessed on 17.3.2023)
- Baking guide: <http://www.reviewlab.com/baking-guide/>.(accessed on 17.3.2023)

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**B.A. (Prog.) with Food Technology (FT) as Non-Major  
Category-III**

**DISCIPLINE SPECIFIC CORE – DSC-10-FT:  
ADVANCED BAKING TECHNOLOGY**

**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		
Advanced Baking Technology	4	2	0	2	Class XII	Basic Baking Technology

**LEARNING OBJECTIVES:**

3. To impart students with knowledge related to processing of breads and Cookies.
4. To familiarize them with basics of food packaging, marketing, and cost control.

**LEARNING OUTCOMES:**

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

6. Skill to prepare various kinds of breads and cookies
7. Illustrate various methods of marketing
8. Compare food packaging materials and their characteristics
9. Prepare food labels and conduct sensory evaluation of prepared baked products
10. Entrepreneurial skill related to bakery products

**SYLLABUS OF DSE-10-FT**

**THEORY  
(Credits 2: 30 Hours)**

**UNIT I: Bread Processing (13 Hours)**

- *Unit Description:* This unit describes bread processing and various spoilage occurring in bread and different bread products.
- *Subtopics:*
  - Preparation of bread - Ingredients, methods of bread dough preparation (straight, sponge, salt delayed, sour dough) steps in bread processing, evaluation of the baked bread.
  - Staling of bread, spoilage in bread and control measures.
  - Types of breads (variety of breads, pizza base, buns, dinner rolls, sourdough products).

**UNIT II: Cookies, Biscuits and Crackers Processing (05 Hours)**

- *Unit Description:* The unit will focus on processing and evaluation of cookies and crackers. It also describes the packaging, storage & labelling of the processed products.
- *Subtopics:*  
Ingredients, types, processing, storage and evaluation.
  - Cookies (Sheet, molded and dropped).
  - Biscuits
  - Crackers.

### UNIT III: Food Packaging, Marketing and Cost Control

(12 Hours)

- *Unit Description:* This unit describes the FSSAI regulations for food packaging, various food packaging materials, food marketing and cost calculation for processed baked food products.
- *Subtopics:*
  - Packaging – its importance, essential features of an ideal package, food packaging materials for baked products.
  - Food Safety and Standard (Packaging) Regulation, 2018, Food Safety and Standard (Labelling and Display) Regulation, 2020.
  - Marketing - definition and importance, marketing strategies (wholesale, retail, digital, swot and market mix) understanding the difference between marketing and sales, 4Ps of marketing (Product, Price, Place, Promotion) and distribution.
  - Cost control – cost components (material cost, labour cost and miscellaneous costs).

### PRACTICAL (Credits 2: 60 Hours)

*No. of Students per Practical Class Group: 10-15*

7. Determination of gluten content in refined wheat flour.
8. Determination of dough raising capacity (DRC) of yeast and factors affecting the yeast activity.
9. Designing labels for baked products.
10. Preparation and sensory evaluation, packaging and costing of breads:
  - White and brown bread
  - Buns
  - Dinner rolls
  - Pizza base
11. Preparation and sensory evaluation, packaging and costing of cookies:
  - Dropped cookies
  - Rolled cookies
  - Molded cookies
12. Preparing any of the baked products in bulk and organizing an exhibition-cum sale.

### ESSENTIAL READINGS (Theory and Practical):

- Dubey S. C. (2016). *Basic Baking: Science and Craft*. Delhi: The Society of Indian Bakers.
- Dubey S. C. (2009). *Bakery Vigyan*. Delhi: The Society of Indian Bakers.
- Matz A. (2008). *Bakery Technology and Engineering*. 10<sup>th</sup> Edition. Delhi: CBS Publishers.
- Kirar, I. (2021). *Textbook of Culinary and Bakery World*, I K International Publishing House Pvt Ltd.



- *Food Safety and Standards Authority of India*: <http://www.fssai.gov.in>(accessed on 17.3.2023)
- Sethi, M. (2005). *Institutional Food Management*. Delhi: New Age International Publishers.
- Food Safety and Standard (Labeling and Display) Regulation, 2020 [https://www.fssai.gov.in/upload/notifications/2020/12/5fd87c6a0f6adGazette\\_Notification\\_Labeling\\_Display\\_14\\_12\\_2020.pdf](https://www.fssai.gov.in/upload/notifications/2020/12/5fd87c6a0f6adGazette_Notification_Labeling_Display_14_12_2020.pdf) (accessed on 17.3.2023)
- Food Safety and Standard (Packaging) Regulation, 2018 [https://www.fssai.gov.in/upload/uploadfiles/files/Gazette\\_Notification\\_Packaging\\_03\\_01\\_2019.pdf](https://www.fssai.gov.in/upload/uploadfiles/files/Gazette_Notification_Packaging_03_01_2019.pdf) (accessed on 17.3.2023)

### SUGGESTED READINGS:

- Faridi, H. (2004). *The Science of Cookie and Crackers Production*. Delhi: CBS Publishers.
- Griffin, S. (1997). *Principles of Food Packaging*. Connecticut: The AVI Publishing Company.
- Khetrpal, N., Grewal, R.B., and Jood, S. (2005). *Bakery Science and Cereal Technology*. Delhi: Daya Publishing House.
- Khanna, K., Gupta, S., Seth, R., Mahana, R., and Rekhi, T. (2004). *The Art and Science of Cooking*. Delhi: Phoenix Publishing House Private Limited.
- Potter, N., and Hotchkiss, J.H. (2006). *Food Science*. Delhi: CBS Publishers.
- Raina, U., Kashyap, S., Narula, V., Thomas, S., Suvira, Vir, S., and Chopra, S. (2005). *Basic Food Preparation – A Complete Manual*. Delhi: Orient Longman.
- Sharma, S., Aggarwal, M. & Sharma, S. (2018). *Food Frontiers*. Delhi: New Delhi Publishers.
- Radhakrishnan, S. (2016). *A Guide To Baking Process*: Write And Print Publications.
- Cauvain, S.P. (2003). *Bread Making Improving Quality*: Elsevier.
- Baking courses: <https://www.udemy.com/topic/baking/>.(accessed on 17.3.2023)
- Baking guide: <http://www.reviewlab.com/baking-guide/>.(accessed on 17.3.2023)

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**DEPARTMENT OF HOME SCIENCE**  
**Semester -VI**  
**B.A. (Prog) with Food Technology (FT) as Major**  
***Category-II***

**DISCIPLINE SPECIFIC CORE – DSC- 11-FT:  
FOOD JOURNALISM**

**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		
Food Journalism	4	3	0	1	Class XII	NIL

**LEARNING OBJECTIVES:**

1. To make students understand the concept food writing and types and role of food media and culture.
2. To familiarize students with the characteristics of a food writer and develop the content writing style.
3. To develop in students the skills required to be a food critic and reviewer.

**LEARNING OUTCOMES:**

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

1. Write articles for newspaper, magazine, commercial co-operations and social media
2. Develop the skill of being a food critic and reviewer
3. Enhance ability related to food photography and investigative food journalism
4. Communicate about food effectively through writing and multimedia storytelling

**SYLLABUS OF DSC-11-FT**

**THEORY**  
**(Credits 3: 45 Hours)**

**UNIT I: Introduction to Food Journalism (12 Hours)**

- *Unit Description:* This unit is an introduction to food journalism, its characteristics and discusses about all kinds of food writing, from memoir to blogging to cookbooks.
- *Subtopics:*
  - Food Writing: What is food journalism, types of food writing.
  - Characteristics of a food writer
  - Content writing style
  - Storytelling and creating your own voices.

**UNIT II: Reviews and Food Critics (12 Hours)**

- *Unit Description:* This unit is about food critics, skills required to be a food critic and reviewer. The unit also has focus on investigative food journalism.
- *Subtopics:*
  - Food critic: Who is a food critic do, types of food critic, skill required for food critic, benefits of being a food critic.
  - Restaurant critics and reviewer
  - Investigative food journalism: food industrialism, Scams and scandals, controversial health studies

### **UNIT III: Food Media and Culture**

**(12 Hours)**

- *Unit Description:* This unit will focus on basic concepts of food writing and photography for various print, social and broadcast media.
- *Subtopics:*
  - Recipe writing (newspaper, magazine, commercial co-operations)
  - Food photography (pixel, camera handling)
  - Technical and Cultural role of social media (Writing on Food Systems and Future, Food in relation with diet and health)
  - Food advertisement, marketing and messaging, business email writing
  - Food TV shows
  - Food trends (Food and Instagram, Blogging and Vlogging)

### **Unit IV: Media Law and Ethics**

**(9 Hours)**

- *Unit Description:* This unit will focus on media pillars, *fssai* food advertisement related regulations and CPA 2019 Act. The unit also discusses media ethics and major acts in media.
- *Subtopics:*
  - Media as 4 pillars and 4 estates
  - Food Advertising Regulation and Consumer Protection in India 2019
  - Food Safety and Standards (Advertising and Claims) Regulations 2018
  - 5 ethics of Journalism (Association of Food Journalists' Code of Ethics)
  - Major Acts in Media

### **PRACTICAL (Credits 1: 30 Hours)**

*No. of Students per Practical Class Group: 10-15*

1. Write a long paragraph about eating a favorite piece of fruit/ passion about food, using all the senses
2. Write a paragraph about food utility objects (e.g. coffee mug: why do you love it, its specialty etc.)
3. Write a recipe for your favorite sandwich/ dish or write a 250-word review of the best restaurant meal you have eaten recently
4. Conduct a survey of a home scale level food business and report writing of the same.
5. Write an article on food fashion/ trends/ food fusion/ we are what we eat/ good eating practices.
6. Food photography (State food/ International and National foods)
7. Conduct an interview of a food blogger/ chef/ restaurant manager/ canteen vendor/ food entrepreneur.

### ESSENTIAL READINGS (Theory and Practical):

- Siniauer, P. (2016). *Writing About Food- A Guide to Good Food Journalism. European Journalism–Fellowships*. 2014 – 2015, Freie Universität Berlin.  
[https://www.hssaatio.fi/wp-content/uploads/2015/07/Siniauer\\_WRITE-ABOUT-FOOD-a-guide-to-good-food-journalism.pdf](https://www.hssaatio.fi/wp-content/uploads/2015/07/Siniauer_WRITE-ABOUT-FOOD-a-guide-to-good-food-journalism.pdf) (accessed on 17.3.2023)
- Jacob, D. (2021). *Will Write for Food: The Complete Guide to Writing Cookbooks, Blogs, Reviews Memoir And More*. 4<sup>th</sup> edition, Da Capo Lifelong Books
- <https://www.livelaw.in/columns/food-safety-and-standards-authority-fssai-food-advertising-consumer-protection-act-212421>(accessed on 17.3.2023)
- <https://www.poynter.org/ethics-trust/2021/association-of-food-journalists-code-of-ethics/>(accessed on 17.3.2023)

### SUGGESTED READINGS:

- Gabrielle, H. Killingsworth, S. (2021). *The Best American Food Writing*. HarperCollins Publishers LLC. Boston, New York.
- Sanghvi Vir. (2019). *The Indian Pantry: The Very Best of Rude*. Penguin publisher, India  
[https://www.amazon.in/s/ref=dp\\_byline\\_sr\\_book\\_1?ie=UTF8&field-author=Sanghvi+Vir&search-alias=stripbooks](https://www.amazon.in/s/ref=dp_byline_sr_book_1?ie=UTF8&field-author=Sanghvi+Vir&search-alias=stripbooks)
- Neelamalar, M. (2010). *Media Law and Ethics*. PHI Learning Pvt Ltd, New Delhi. (ISBN 9788120339743)

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

### DISCIPLINE SPECIFIC CORE – DSC-12-FT: ADVANCED PRESERVATION TECHNOLOGY

### 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		
Advanced Preservation Technology	4	3	0	1	Class XII Pass	Basic Preservation Technology

### LEARNING OBJECTIVES:

1. To impart knowledge about advanced preservation techniques such as dehydration, canning and freezing.
2. To equip the students with knowledge and skills for preparing, packaging, evaluating and marketing of preserved pectin products and preserves.

### COURSE OUTCOMES:

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

1. Describe the different principles and methods of fruit and vegetable preservation and processing

2. Compare different advanced preservation techniques such as dehydration, concentration, refrigeration and freezing
3. Describe the various steps in dehydration, freezing, canning, pectin products and preserves
4. Prepare, evaluate, package and market jams, jelly, marmalade, and preserves professionally

## **SYLLABUS OF DSC-12-FT**

### **THEORY (Credits 3: 45 Hours)**

#### **UNIT I: Canning/ Hermetic Preservation (10 Hours)**

- *Unit Description:* This unit will focus on the purpose of preservation via canning/hermetic sealing and packaging which is termed as the father of preservation.
- *Subtopics:*
  - Definition and objectives of canning
  - Principle of Preservation, steps of canning of fruits and vegetables (with special emphasis on blanching, exhausting and heat processing)
  - Spoilage of canned foods
  - Packaging

#### **UNIT II: Refrigeration and Freezing (9 Hours)**

- *Unit Description:* This unit will focus on the technique of Freezing and Refrigeration as a means of Preservation.
- *Subtopics:*
  - Definition and objectives of Refrigeration and Freezing
  - Principles of Refrigeration and Freezing
  - Methodology of Refrigeration and Freezing of fruits and vegetables
  - Cryogenic Freezing
  - Evaluation of Refrigerated and Frozen foods
  - Cold Storage and Cellars

#### **UNIT III: Dehydration (8 Hours)**

- *Unit Description:* This unit will focus on the technique of dehydration and concentration as a means of preservation.
- *Subtopics:*
  - Dehydration- definition and objectives
  - Method of preservation, normal drying curve, water activity, factors affecting rate of drying,
  - Sun drying,
  - Types of dehydration techniques and steps involved.
  - Concentration- definition and objectives, techniques
  - Rehydration

#### **UNIT IV: Fruit and Vegetable Processing –Pectin Products, and Preserves (18 Hours)**

- *Unit Description:* This unit will focus on the processing of jam, jelly, marmalades, preserves and pickles.
- *Subtopics:*

- Jam, Jelly and Marmalade- definition, role of pectin and theory of gel formation
- Method of preservation, steps of preparation and evaluation of jam, jelly and marmalade
- Preserves- definition of candied, crystallized and glazed fruits.
- Principle of preservation, steps of preparation and evaluation of candied, crystallized and glazed fruits

### **PRACTICAL** **(Credits 1: 30 Hours)**

*No. of Students per Practical Class Group: 10-15*

Preparation, packaging, labelling, sensory/objective (TSS, pH and headspace) evaluation and costing of:

1. Jam (apple jam and mixed fruit jam)
2. Jelly (guava jelly)
3. Marmalade (orange marmalade)
4. Preserve (carrot)
5. Dehydration of vegetables (green leafy vegetables, other vegetables and tubers)
6. Rehydration of dehydrated vegetables
7. Freezing of vegetables
8. Preparing any of the preserved product/new product in bulk and organizing an exhibition-cum-sale.

### **ESSENTIAL READINGS (Theory and Practical):**

- Rao, E.S., Garg, M. and Barwa, M.S.(2023). *Handbook on Processing and Preservation of Fruits and Vegetables*. 2nd edn. Variety Books Publisher's Distributors, New Delhi
- Potter, N., and Hotchkiss, J.H. (2006). *Food Science*. Delhi: CBS Publishers.
- Lal, G., Siddhapa, G.S., and Tandon, G.L. (2009). *Preservation of Fruits and Vegetables*. New Delhi: Indian Council of Agriculture Research.
- Srivastava, S.S. (2006). *PhalParirakshan*. Lucknow: Kitab Mahal.
- Barba, F. J., Ahrné, L., Xanthakis, E., Landerslev, M. G., and Orlien, V. (2018). Innovative technologies for food preservation. In: *Innovative Technologies for Food Preservation* (pp. 25-51). Academic Press.
- Board, N. P. C. S. (2012). *Modern Technology on Food Preservation*. Asia Pacific Business Press Inc.
- Goyal, MR., Mishra, S.K., and Birwal, P. (2022). *Food Processing and Preservation Technologies – advances, methods and applications*. New York: Apple Academic Press.

### **SUGGESTED READINGS:**

- Khurdia, D.S. (1995). *Preservation of Fruits and Vegetables*. New Delhi: Indian Council of Agriculture Research.
- Hui, Y.H., and Evaranuz, E.O. (2015). *Handbook of Vegetable Processing and Preservation*. 2nd Edition. USA: CRC Press.
- Sharma, S. (2010). *Postharvest Management and Processing of Fruits and Vegetables*: Instant Notes. New India Publishing Agency.
- Ramaswamy, H. and Marcotte, M. (2009). *Food Processing–Principles and Applications*. Boca Raton: Taylor and Francis.
- Srilakshmi, B. (2018). *Food Science*. Seventh Edition. Delhi: New Age Publications.
- Subbalakshmi, G. and Udipi, S.A. (2007). *Food Processing and Preservation*. Delhi: New Age International Publishers.

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**B.A. (Prog.) with Food Technology (FT) as Non-Major  
Category-III**

**DISCIPLINE SPECIFIC CORE – DSC-12-FT:  
ADVANCED PRESERVATION TECHNOLOGY**

**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		
Advanced Preservation Technology	4	3	0	1	Class XII Pass	Basic Preservation Technology

**LEARNING OBJECTIVES:**

1. To impart knowledge about advanced preservation techniques such as dehydration, canning and freezing.
2. To equip the students with knowledge and skills for preparing, packaging, evaluating and marketing of preserved pectin products and preserves.

**COURSE OUTCOMES:**

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

1. Describe the different principles and methods of fruit and vegetable preservation and processing.
2. Compare different advanced preservation techniques such as dehydration, concentration, refrigeration and freezing.
3. Describe the various steps in dehydration, freezing, canning, pectin products and preserves.
4. Prepare, evaluate, package and market jams, jelly, marmalade, and preserves professionally.

**SYLLABUS OF DSC-12-FT**

**THEORY  
(Credits 3: 45 Hours)**

**UNIT I: Canning/ Hermetic Preservation (10 Hours)**

- *Unit Description:* This unit will focus on the purpose of preservation via canning/hermetic sealing and packaging which is termed as the father of preservation.
- *Subtopics:*
  - Definition and objectives of canning
  - Principle of Preservation, steps of canning of fruits and vegetables (with special emphasis on blanching, exhausting and heat processing)
  - Spoilage of canned foods
  - Packaging

**UNIT II: Refrigeration and Freezing (9 Hours)**

- *Unit Description:* This unit will focus on the technique of Freezing and Refrigeration as a means of Preservation.

- *Subtopics:*
  - Definition and objectives of Refrigeration and Freezing
  - Principles of Refrigeration and Freezing
  - Methodology of Refrigeration and Freezing of fruits and vegetables
  - Cryogenic Freezing
  - Evaluation of Refrigerated and Frozen foods
  - Cold Storage and Cellars

### **UNIT III: Dehydration**

**(8 Hours)**

- *Unit Description:* This unit will focus on the technique of dehydration and concentration as a means of preservation.
- *Subtopics:*
  - Dehydration- definition and objectives
  - Method of preservation, normal drying curve, water activity, factors affecting rate of drying,
  - Sun drying,
  - Types of dehydration techniques and steps involved.
  - Concentration- definition and objectives, techniques
  - Rehydration

### **UNIT IV: Fruit and Vegetable Processing –Pectin Products, and Preserves**

**(18 Hours)**

- *Unit Description:* This unit will focus on the processing of jam, jelly, marmalades, preserves and pickles.
- *Subtopics:*
  - Jam, Jelly and Marmalade- definition, role of pectin and theory of gel formation
  - Method of preservation, steps of preparation and evaluation of jam, jelly and marmalade
  - Preserves- definition of candied, crystallized and glazed fruits.
  - Principle of preservation, steps of preparation and evaluation of candied, crystallized and glazed fruits.

### **PRACTICAL (Credits 1: 30 Hours)**

*No. of Students per Practical Class Group: 10-15*

Preparation, packaging, labelling, sensory/objective (TSS, pH and headspace) evaluation and costing of:

1. Jam (apple jam and mixed fruit jam)
2. Jelly (guava jelly)
3. Marmalade (orange marmalade)
4. Preserve (carrot)
5. Dehydration of vegetables (green leafy vegetables, other vegetables and tubers)
6. Rehydration of dehydrated vegetables
7. Freezing of vegetables
8. Preparing any of the preserved product/new product in bulk and organizing an exhibition-cum-sale.



### ESSENTIAL READINGS (Theory and Practical):

- Rao, E.S., Garg, M. and Barwa, M.S.(2023). *Handbook on Processing and Preservation of Fruits and Vegetables*. 2nd edn. Variety Books Publisher's Distributors, New Delhi
- Potter, N., and Hotchkiss, J.H. (2006). *Food Science*. Delhi: CBS Publishers.
- Lal, G., Siddhapa, G.S., and Tandon, G.L. (2009). *Preservation of Fruits and Vegetables*. New Delhi: Indian Council of Agriculture Research.
- Srivastava, S.S. (2006). *Phal Parirakshan*. Lucknow: Kitab Mahal.
- Barba, F. J., Ahrné, L., Xanthakis, E., Landerslev, M. G., and Orlén, V. (2018). Innovative technologies for food preservation. In: *Innovative Technologies for Food Preservation* (pp. 25-51). Academic Press.
- Board, N. P. C. S. (2012). *Modern Technology on Food Preservation*. Asia Pacific Business Press Inc.
- Goyal, MR., Mishra, S.K., and Birwal, P. (2022). *Food Processing and Preservation Technologies – advances, methods and applications*. New York: Apple Academic Press.

### SUGGESTED READINGS:

- Khurdia, D.S. (1995). *Preservation of Fruits and Vegetables*. New Delhi: Indian Council of Agriculture Research.
- Hui, Y.H., and Evaranuz, E.O. (2015). *Handbook of Vegetable Processing and Preservation*. 2nd Edition. USA: CRC Press.
- Sharma, S. (2010). *Postharvest Management and Processing of Fruits and Vegetables: Instant Notes*. New India Publishing Agency.
- Ramaswamy, H. and Marcotte, M. (2009). *Food Processing—Principles and Applications*. Boca Raton: Taylor and Francis.
- Srilakshmi, B. (2018). *Food Science*. Seventh Edition. Delhi: New Age Publications.
- Subbalakshmi, G. and Udipi, S.A. (2007). *Food Processing and Preservation*. Delhi: New Age International Publishers.

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## **DEPARTMENT OF HOME SCIENCE**

### **B.A (PROG) WITH FOOD TECHNOLOGY (FT)**

#### **B.A. (Prog) with Food Technology (FT) as Major & Non-Major** **Pool DSE: Odd Semester**

#### **DISCIPLINE SPECIFIC ELECTIVE COURSE – DSE-1-FT: CEREAL AND PULSE TECHNOLOGY**

#### **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		
Cereal and Pulse Technology	4	3	0	1	Class XII Pass	NIL

#### **LEARNING OBJECTIVES:**

1. To acquaint students with various types of indigenous grains available.
2. To impart knowledge regarding post-harvest technology of various cereals, millets and pulses.
3. To acquaint students with processing of cereals, millets and pulses with principles, mechanism and machinery involved.

#### **COURSE OUTCOMES:**

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

1. Understand basic composition and structure of food grains.
2. Understand the basics of milling operations and storage of grains.
3. Learn processing of food grains into value added products.
4. Access the physical and cooking properties of cereals, millets and pulses.

#### **SYLLABUS OF DSE-1-FT**

##### **THEORY** **(Credits 3: 45 Hours)**

##### **UNIT I: Introduction to Cereals, Millets and Pulses**

**(7 Hours)**

- *Unit Description:* This unit will introduce the students to various grains in Indian context with its production, utilization, availability and grading standards.
- *Subtopics:*

- General introduction
- Production and utilization trends
- Grain classification
  - Classification of cereals, pulses and millets
  - Market varieties of various grains available in India
  - Grading standards of various grains

## **UNIT II: Staple Grain Processing**

**(18 Hours)**

- *Unit Description:* This unit will focus on various aspects pertaining to the composition and processing of staple cereals with the related processed products.
- *Subtopics:*
  - Structure, physico-chemical properties of staple grains (wheat, rice, corn)
  - Wheat processing
    - Cleaning, tempering, conditioning and milling of wheat
    - Flour treatments (bleaching, maturing) and grading
    - Wheat products (Wheat flour, semolina, dahlia)
  - Rice processing
    - Milling and parboiling of paddy
    - Curing and ageing of paddy and rice; cooking and storage qualities of raw and parboiled rice
    - Rice products (Polished rice, Brown rice, popped, puffs, rice rawa, rice flour)
  - Corn processing
    - Dry and wet milling
    - Starch and its conversion products and processed corn products (popped corn, corn flakes etc.)

## **UNIT III: Coarse grain and Millet Processing**

**(10 Hours)**

- *Unit Description:* This unit describes the composition and processing of coarse grains and millets with their respective products.
- *Subtopics:*
  - Oats Processing
  - Physico-chemical properties and composition of millets
  - Primary processing operations of millets
  - Coarse grain and millet processed products.

## **UNIT IV: Pulse Processing**

**(10 Hours)**

- *Unit Description:* This unit will focus on composition and processing of pulses with its respective products.
- *Subtopics:*
  - Structure, physico-chemical properties and composition of pulses and legumes
  - Traditional and modern milling methods
  - Soybean Processing
  - Products and by-products of pulse milling

## **PRACTICAL** **(Credits 1: 30 Hours)**

*No. of Students per Practical Class Group: 10-15*

1. Physical properties of staple grains (seed weight, seed volume, seed density and hydration capacity)
2. Physical properties of millets (seed weight, seed volume, seed density and hydration capacity)
3. Cooking parameters of rice (water uptake ratio, gelatinization temperature)
4. Popping of grains (wheat/rice/corn/millets)
5. Product preparation from pulses (cleaning, soaking, drying, de-husking, product preparation)
6. Preparation of amylase rich/malt flour from grains
7. Visit to a cereal/pulse processing plant.

### ESSENTIAL READINGS (Theory and Practical):

- Rosentrater, K. A., and Evers, A. D. (2017). *Kent's Technology of Cereals: An Introduction for Students of Food Science and Agriculture*. Woodhead Publishing.
- Rice Milling Manual by IRRI. [http://www.knowledgebank.irri.org/ericeproduction/PDF\\_&\\_Docs/Teaching\\_Manual\\_Rice\\_Milling.pdf](http://www.knowledgebank.irri.org/ericeproduction/PDF_&_Docs/Teaching_Manual_Rice_Milling.pdf)(accessed on 17.3.2023)
- Kate, A. and Singh, A. (2021). Processing Technology for Value Addition in Millets. In: Kumar, A., Tripathi, M.K., Joshi, D., Kumar, V. (eds) *Millets and Millet Technology*. Springer, Singapore. [https://doi.org/10.1007/978-981-16-0676-2\\_11](https://doi.org/10.1007/978-981-16-0676-2_11)(accessed on 17.3.2023)
- Chapke et al. 2020. Latest millet production and processing technologies. Indian Institute of Millet Research. [https://www.millets.res.in/farmer/Latest\\_Millet\\_English\\_Full\\_Book\\_2020.pdf](https://www.millets.res.in/farmer/Latest_Millet_English_Full_Book_2020.pdf)
- Potter, N. N., and Hotchkiss, J. H. 2012. *Food Science*. Springer Science and Business Media.
- Williams, P.C.; Nakoul, H. and Singh, K.B. (1983). Relationship between cooking time and some physical characteristics in chickpea (*Cicer arietinum* L.). *J. Fd. Sci. Agric.* 34: 492-495.
- Oko, A.O., Ubi, B.E., Efisue, A.A. and Dambaba, N. (2012). Comparative analysis of the chemical nutrient composition of selected local and newly introduced rice varieties grown in Ebonyi state of Nigeria. *International Journal of Agriculture and Forestry*. 2(2): 16-23.
- Chandra, S. and Samsher, L. (2013). Assessment of Functional Properties of Different Flours. *African Journal of Agricultural Research*, 8, 4849-4852.
- <https://egyankosh.ac.in/bitstream/123456789/45848/1/Experiment-12.pdf>(accessed on 17.3.2023)
- <http://ecoursesonline.iasri.res.in/mod/resource/view.php?id=5933>(accessed on 17.3.2023)
- Nwosu, J.N.; Owuamanam, C.I., Omeire, G.C. and Eke, C.C. (2014). Quality parameters of bread produced from substitution of wheat flour with cassava flour using soybean as an improver. *American J. Res. Commu.*, 2 (3): 99-118.

### SUGGESTED READINGS:

- Davis, J. G. (1982). *Food Science and Technology*: By Magnus Pyke, revised and enlarged by LelioParducci. John Murray, London, 304 pp
- Chakraverty, A., Raghavan, G. S. V., & Ramaswamy, H. S. (2003). *Handbook of post-harvest technology*. Marcel Dekker, Inc
- Hosney, R. C. and Delcour J. A. (2010). *Principles of Cereal Science and Technology* (No. Ed. 3). American Association of Cereal Chemists (AACC).
- Dendy DAV and Dobraszczyk B.J. (2001). *Cereal and Cereal Products*. Aspen
- Karl, K. (2000). *Handbook of Cereal Science and Technology*. 2nd Rev. Edition. CRC Press
- Matthews, R. H. (1989). *Legumes: Chemistry, Technology, and Human Nutrition*. American Association of Cereal Chemists (AACC).
- Sethi, P. and Lakra, P. (2015). *Aahar Vigyan, Poshan Evam Suraksha*. Delhi: Elite Publishing

House Pvt. Ltd.

- Sahay, K.M. and K.K. Singh. (1994). *Unit Operations in Agricultural Processing*, Vikas Publishing House Pvt. Ltd., New Delhi, p.340.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC ELECTIVE – DSE-3-FT:  
FOOD CULTURAL PERSPECTIVES**

**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		
Food Cultural Perspectives	4	3	0	1	Class XII Pass	NIL

**LEARNING OBJECTIVES:**

1. To make students aware of the rich cultural food heritage of India.
2. To make students understand the importance of food in social events and the intercultural communications.

**LEARNING OUTCOMES:**

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

1. Understand the factors influencing the diversity in diets of India
2. Comprehend the Indian rich cultural parameters related to food during various community and family social occasions and events
3. Have knowledge regarding variation in Indian food as per the religion
4. Get acquainted with the various myths, beliefs and intercultural communications related to diverse Indian food culture

**SYLLABUS OF DSE-3-FT**

**THEORY  
(Credits 3: 45 Hours)**

**UNIT I: Introduction: Influences on Food and Food Habits (10 Hours)**

- *Unit Description:* This unit is about food culture around the world and the varied factors influencing the Indian food cultural practices.
- *Subtopics:*
  - Introduction, Early food habits, Food around the world – current scenario
  - Agricultural developments over the years

- Factors influencing diets- geography, environmental factors (water, climate, soil, weather, natural calamities), trade, war and peace.

## **UNIT II: Cultural Parameters**

**(10 Hours)**

- *Unit Description:* This unit is about the importance and type of food offered on various special occasions and events in Indian society.
- *Subtopics:*
  - Birth and Death
  - Architecture/Housing
  - Language
  - Lifestyle
  - Art and literature
  - Immigration/travel
  - Festivals, special occasions and events

## **UNIT III: Identity of Food - Religion, beliefs, myths**

**(15 Hours)**

- *Unit Description:* The unit describes the Indian food cultural diversity according to the varied religions of India and the common food myths and beliefs.
- *Subtopics:*
  - Food habits and practices – Hinduism, Jainism, Buddhism, Muslim, Christianity
  - Common food myths and beliefs

## **Unit IV: Food - Intercultural Communications**

**(10 Hours)**

- *Unit Description:* This unit will discuss the effect of customs, traditions, culture on the way food is cooked, served, consumed and associated with.
- *Subtopics:*
  - Language (mother tongue)
  - Body language and Customs
  - Food attitude and traditions
  - Cultural differences – food-based practices.
  - Food – a mode of communicating at international level/other social functions of food

## **PRACTICAL (Credits 1: 30 Hours)**

*No. of Students per Practical Class Group: 10-15*

1. Preparation of types of questionnaires for interview/ survey.
2. Exploring the menu of various cultural food outlets around your locality.
3. Identify and compare the two diverse Indian regional meals/ cuisines.

4. Identify and present the *PRASADAM* and its cultural importance at various Indian religious places.

OR

Prepare a brief report/ Power Point Presentation (PPT) on FSSAI initiative BHOG (Blissful Hygienic Offering to God).

5. Explore and present Food as Medicine in Indian literature.
6. Organize Indian regional cuisine Exhibition/ competition/ Quiz in your institution.
7. Critically evaluate any Indian folk tale/song w.r.t food cultural behaviour.

OR

Write a critique on magazine and newspaper articles pertaining to Indian cultural food habits and patterns.

8. Visit to food fair.

### ESSENTIAL READINGS (Theory and Practical):

- McWilliams, M. (2015). *Food Around the World: A Cultural Perspective*. Fourth Edition. Pearson Education Inc.
- Srinivas, T. (2011). *Exploring Indian Culture through Food*. *Food, Culture and Asia*; 16(3): 38-41.
- Sen, C.T. (2004). *Food Culture in India*. Greenwood Press.
- Nandrajog, H. and Suri, S. (2021). *The Saga of Food: Reflections on Technology and Culture*. International Book House.

### SUGGESTED READINGS:

- Szanto, D., Battista, A.D. and Knezevic, I. (2022). *Food Studies: Matter, Meaning and Movement*. Food Studies Press.
- Kittler, P.G. and Sucher, K.P. (2008). *Food and Culture*. Fifth Edition. Thomson Wadsworth Publishing.
- Albala, K. (2013). *Food: A Cultural Culinary History*. The Great Courses.
- Acharya, K.T. (2000). *Indian Food: A Historical Comparison*. Oxford Press.
- Bhushi, K. (2018). *Farm to Fingers: The Culture and Politics of Food in Contemporary India*. First Edition. Cambridge University Press.
- Lonely, P. (2001). *World Food: India*. Lonely Planet Oakland.
- Ali, E., Naquiah, N. and Nizar, A. (2018). *Preparation and Processing of Cultural Food*. First edition. Woodhead Publishing House (Elsevier).

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC ELECTIVE – DSE-5-FT:  
OPERATIONAL LEADERSHIP AND MANAGEMENT: FOOD INDUSTRY**

**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		
Operational Leadership and Management	4	3	0	1	Class XII Pass	NIL

**LEARNING OBJECTIVES:**

1. To understand the basic concepts related to operational leadership and management.
2. To know the characteristics of a good leader and effective leadership in variable situations.
3. To be able to conceptualize the role and responsibilities of a manager in various unit operations in food industry.

**LEARNING OUTCOMES:**

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

1. Gain the skills of operational leadership and management in food handling and processing
2. Develop strategic plan of action which can support principles and framework of operational management
3. Work in a lead role for managing unit operations/assembly lines in food processing units and various food businesses.

**SYLLABUS OF DSE-5-FT**

**THEORY  
(Credits 3: 45 Hours)**

**UNIT I: Introduction**

**(8 Hours)**

- *Unit Description:* This chapter will introduce to the students to the concept of operational leadership and management, the historical background, importance and challenges in the field especially with relevance to the food industry.
- *Subtopics:*
  - Introduction to basic concepts: unit operations, management, leadership, operational leadership, operational management, operational thinking.
  - Operational leadership and operational management: evolution, scope, emerging concerns.
  - Approaches to management of food manufacturing and food service unit.



## **UNIT II: Operational leadership**

**(12 Hours)**

- *Unit Description:* This unit will help students know about the basics of leadership, leadership styles, characteristics and responsibilities of an effective leader viz-a-viz operational leader.
- *Subtopics:*
  - Leadership – concept, qualities of an effective leader
  - Leadership styles, difference between strategic and operational leadership
  - Characteristics or role of operational leaders
  - Communications for effective operational leadership

## **UNIT III: Basics of Management**

**(10 Hours)**

- *Unit Description:* The unit will help student understand the importance, principles and functions of management. It will also help them to understand the work responsibilities of a manager with regards to judicious management of human resources for efficient productivity.
- *Subtopics:*
  - Introduction, significance and scope of management
  - Principles of management
  - Functions of management
  - Role of manager/supervisor in work productivity (vertical/horizontal division of labour, departmentalization, organization chart) with relevance to food industry.
  - Decision making – steps and barriers; importance of decision making in operations management.

## **Unit IV: Operational Management in food industry**

**(15 Hours)**

- *Unit Description:* Through this unit the student will learn about efficient administration of business practices which is the primary responsibility of an operational manager. The chapter will discuss about the various aspects of operational management which can lead to enhanced quality and productivity in an efficient manner.
- *Subtopics:*
  - Importance of operations manager and operational management in food industry (models/process)
  - Job Analysis and description (ergonomics, role of duty rosters and SOP), work design and work measurement
  - Material Management (purchase, store, inventory, standardization)
  - Improving productivity (forecasting, scheduling and controlling production activities) System design and capacity planning
  - Food Safety Management System
  - Role of automation and Artificial Intelligence in operational management

### **PRACTICAL (Credits 1: 30 Hours)**

*No. of Students per Practical Class Group: 10-15*

1. Prepare a summary report on a short film/documentary on manufacturing a food product to study management of assembly lines or during various stages of production.  
or

Critically review approaches of management in a food enterprise unit through a short film/documentary.

2. Prepare a presentation on the leadership styles and stages of operational management through a short film/documentary on the success story of food enterprise led by a woman leader.
3. Visit a nearby small-scale food production unit such as college canteen and understand the applications of “forecasting” for any 2 food products.
4. As an operation manager, prepare an organizational chart, duty roster and job description for a bakery/food preservation unit.
5. Develop an operational leader assessment worksheet in a food production or food processing unit.  
<https://clgm.net/files/pdf/OPERATIONAL%20LGL%20Profile%20November%202014.pdf>
6. Prepare a presentation on role of computers, artificial intelligence and CAD currently being used in the food processing industry.
7. Prepare a work flowchart for a food processing unit for material handling.
8. Conduct SWOT analysis in a given case study regarding operational management of a process in a food processing unit.

### ESSENTIAL READINGS (Theory and Practical):

- Gupta, S. and Starr, M. (2014). *Production and Operation Management System*. London: CRC press Taylor & Francis Group.
- Kumar, A.S. and Suresh, N. (2008). *Production and Operations Management* (skill Development, Caselets and Cases). Bangalore: New Age International (P) Limited Publisher.
- Render, B. (2012). *The Encyclopedia of Operations Management. A field Manual and Glossary of Operations Management Terms and Concepts*. Pearson.
- Stevenson, W.J. (2018). *Operations Management*. (13th edn.). McGraw-Hill Education, New York
- Greasley, A. (2013). *Operations management*. (3rd edn.). John Wiley & Sons, Limited.
- Young, S.T. (2010). *Essentials of Operations Management*. Sage Publications, United State of America.
- Reid, R., and Sanders, N.R. (2010). Chapter 1. Introduction to Operations Management. In: *Operations Management*. (4th edn.). John Wiley & Sons, Inc.  
a. <https://catalogimages.wiley.com/images/db/pdf/9781119497332.excerpt.pdf>
- Morill, R.L. (2010). *Strategic Leadership*. United Kingdom: Rowman & Little field Publishers.
- Merel, S. (2017). *Leadership Styles in the Context of the Food Processing Industries*. Wageningen Research. <https://livrepository.liverpool.ac.uk/3090163/>

### SUGGESTED READINGS:

- Certified Local Government Manager (CLGM), Society of Local Government Managers of Alberta (SLGM) (2014). Operational local government leader profile <https://clgm.net/files/pdf/OPERATIONAL%20LGL%20Profile%20November%202014.pdf>
- Dittmer, P.R, and Keefe, J.D. (2009). *Principles of Food, Beverage and Labour Cost Controls* (9th edn.). John Wiley & Sons, United State of America.
- Kumar, S.A, Suresh, N. (2009). *Operations Management*. New Age International Publishers. Delhi.
- Palacio, J. and Theis, M. (2009). *Food Service Management: Principles and Practices*. New Jersey: Pearson.
- Russell, R.S., Taylor, B.W (2011). *Operations Management – Creating Value Along the Supply Chain* (7<sup>th</sup> edn.). John Wiley and Sons, Inc. United States of America.

- Seuring, Stefan, Sarkis, Joseph and Klassen, Robert 2014. Sustainable operations management: recent trends and future directions [Editorial]. *International Journal of Operations and Production Management* 34 (5) 10.1108/IJOPM-12-2013-0557
- Smith, R.A. and Siquaw, J. (2010). *Strategic Hospitality Leadership*. John Wiley & Sons Pte. Ltd.
- Stevenson, W.J. (2018). *Operations Management*. (13<sup>th</sup> edn.). McGraw-Hill Education, New York.
- Wallis, J. (2016). Operational Leadership. In: Farazmand, A. (eds) *Global Encyclopedia of Public Administration, Public Policy, and Governance*. Springer, Cham. [https://doi.org/10.1007/978-3-319-31816-5\\_1921-1](https://doi.org/10.1007/978-3-319-31816-5_1921-1)

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**B.A. (Prog) with Food Technology (FT) as Major & Non-Major**  
**Pool DSE: Even Semester**

**DISCIPLINE SPECIFIC ELECTIVE – DSE-2-FT:  
POST HARVEST TECHNOLOGY**

**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		
Post Harvest Technology	4	3	0	1	Class XII Pass	NIL

**LEARNING OBJECTIVES:**

4. To familiarize students with role of post-harvest technology.
5. To impart knowledge regarding the developmental dynamics of agricultural produce.
6. To acquaint students with technological approaches involved in reduction of post-harvest losses.

**COURSE OUTCOMES:**

Upon successful completion of this course, students will be able to:

1. Explain the principles of post-harvest technology
2. Illustrate the physiological and biochemical changes that occur during various stages of fruits and vegetables development and production
3. Understand the causes of post-harvest losses, and remedial methods to reduce them
4. Indicate the importance and the significance of proper post-harvest handling to maintain the quality of agricultural produce

**SYLLABUS OF DSE-2-FT**

**THEORY**  
**(Credits 3: 45 Hours)**

**UNIT I: Introduction to Post-Harvest Technology**

**(9 Hours)**

- *Unit Description:* This unit will introduce the students to the relevance and current status of post-harvest technology in global scenario.
- *Subtopics:*
  - Introduction to Post-harvest technology
  - Importance and need.
  - Status of post-harvest: Global scenario
  - Factors affecting quality of horticultural produce.
    - Pre-harvest (customization of produce by moulding method)
    - Harvest

- Post-Harvest

## **UNIT II: Physiology and Biochemistry of Horticultural Produce (10 Hours)**

- *Unit Description:* This unit will focus on various physiological and biochemical changes in horticultural produce after harvest.
- *Subtopics:*
  - Physiology of horticultural produce
  - Respiration rate and associated factors
  - Biochemical and physiological changes during ripening and ethylene biosynthesis
  - Maturity indices in horticultural produce
  - Disorders in horticultural produce

## **UNIT III: Post-harvest Losses and Treatments for Prevention (17 Hours)**

- *Unit Description:* This unit describes the post-harvest losses, associated factors and the treatments involved in reduction of such losses
- *Subtopics:*
  - Introduction and types of post-harvest losses
  - Factors responsible
    - Biological
    - Environmental
  - Post-harvest treatments
    - Pre-cooling
    - Cleaning, washing, dry-cleaning and dressing.
    - Curing, drying, vapor heat treatment and degreening
    - Dys-infection and sprout suppression
    - Wax-coating, astringency reduction and irradiation
    - Regulation of ripening

## **UNIT IV: Storage and Packaging (9 Hours)**

- *Unit Description:* This unit will focus on storage and packaging techniques of horticultural produce.
- *Subtopics:*
  - Principles of storage.
  - Traditional (in situ, sand, coir, pits, clamps, windbreaks, cellars, barns, evaporative cooling, ZECC) and advanced storage methods (Controlled atmosphere Storage, Modified Atmospheric Storage, Cold storage).
  - Packaging of horticultural produce- material, techniques-basic and advanced.

## **PRACTICAL (Credits 1: 30 Hours)**

*No. of Students per Practical Class Group: 10-15*

- Classify any fruit(ex.-banana) based on physical maturity indices
- Determination of firmness in fruits by penetrometer
- Determination of the juice content in different maturity stages of fruit
- Determination of fruit acids by titration and calculation of the sugar/acid ratio

12. Determination of the starch content of apples/pears using an iodine solution
13. Determination of pesticide residue in fresh farm produce by using chlorine test strips
14. Presentation on post-harvest management of any fruit/vegetable by application of low cost and modern techniques

OR

Visit to a nearby farm.

### ESSENTIAL READINGS (Theory and Practical):

- Yahia, E. M., and Carrillo-Lopez, A. (Eds.). (2018). *Postharvest Physiology and Biochemistry of Fruits and Vegetables*. Woodhead Publishing.
- Wills, R., and Golding, J. (2016). *Postharvest: An Introduction to The Physiology and Handling Of Fruit And Vegetables*. UNSW press.
- Siddiq, M., Ahmed, J., Lobo, M. G., and Ozadali, F. (Eds.). (2012). *Tropical and Subtropical Fruits: Postharvest Physiology, Processing and Packaging*. John Wiley & Sons.
- Singh, I.S. (2009). *Post-Harvest Handling and Processing of Fruits and Vegetables*, West vill Publishing House.
- Chakraverty, A., Mujumdar, A. S., and Ramaswamy, H. S. (Eds.). (2003). *Handbook Of Postharvest Technology: Cereals, Fruits, Vegetables, Tea, And Spices* (Vol. 93). CRC press. <http://ecoursesonline.iasri.res.in/course/view.php?id=164>(accessed on 17.3.2023)
- FAO. Post-harvest system and food losses. <https://www.fao.org/3/ac301e/AC301e03.html>(accessed on 17.3.2023)
- FAO. Prevention of post-harvest food losses fruits, vegetables and root crops a training manual. <https://www.fao.org/3/t0073e/t0073e00.html>(accessed on 17.3.2023)

### SUGGESTED READINGS:

- Wills, R. B., and Golding, J. (Eds.). (2016). *Advances in Postharvest Fruit and Vegetable Technology*. CRC press.
- Kitinoja, L., and Gorny, J. R. (1999). Postharvest technology for small-scale produce marketers: economic opportunities, quality and food safety. *Postharvest technology for small-scale produce marketers: economic opportunities, quality and food safety*.
- Kadar, A.A. (2002). *Post Harvest Technology of Horticultural Crops*, 2nd Edition, University of California.
- [http://postharvest.org/PEF\\_Training\\_of\\_Postharvest\\_Trainers\\_Manual\\_2019\\_2Ed.pdf](http://postharvest.org/PEF_Training_of_Postharvest_Trainers_Manual_2019_2Ed.pdf)
- <https://agmarknet.gov.in/Others/CPBANANA.pdf>(accessed on 17.3.2023)
- <https://www.oecd.org/agriculture/fruit-vegetables/publications/guidelines-on-objective-tests.pdf>(accessed on 17.3.2023)

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC ELECTIVE – DSE-4-FT:  
FOOD VALUE CHAIN MANAGEMENT**

**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		
Food Value Chain Management	4	3	0	1	Class XII Pass	NIL

**LEARNING OBJECTIVES:**

6. To understand the basic concepts related to food value chain management.
7. To know the principles, process and components of value chain management with special reference to the food industry.
8. To learn the scope and challenges associated with sustainable food value chain management.

**LEARNING OUTCOMES:**

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

9. Appreciate the significance of managing food value chains
10. Develop strategic plan of action which can support the concept of sustainability in food value-addition
11. Manage unit operations/assembly lines in food processing units

**SYLLABUS OF DSE-4-FT**

**THEORY  
(Credits 3: 45 Hours)**

**UNIT I: Introduction: Concept and Framework (8 Hours)**

- *Unit Description:* This unit will discuss about the concept of food value chain and the basic framework necessary for its application. It will help students understand the difference and association of value chain vis-à-vis food value chain.
- *Subtopics:*
  - Basic Concepts: value chain, food value chain, sustainable food value chain, supply food chain management, sustainable food value chain development.
  - Concept of “value added” in food chains.
  - Sustainable food value chain framework.

**UNIT II: Principles and Components of Sustainable Food Value Chain Development (12 Hours)**

- *Unit Description:* This unit will discuss about the basic principles and components which help in the planning and implementation of food value chain.
- *Subtopics:*
  - Principles of sustainable food value chain development: measuring, understanding and improving
  - Components of sustainable food value chain development

### **UNIT III: Food Supply Chain Management (15 Hours)**

- *Unit Description:* Food supply chain is an important for successful food value chain management. This unit will discuss the basic aspects of supply chain management.
- *Subtopics:*
  - Types of food supply chains
  - Management of operations: manufacturing and processing of food
  - Operational Challenges: food logistics in procurement, distribution, transportation and retailing (case study)

### **Unit IV: Challenges and Potential in Food Value Chain Management (10 Hours)**

- *Unit Description:* This chapter will discuss the future challenges and potential or scope of successful and sustainable food value chain management.
- *Subtopics:*
  - Social and economic aspects
  - Food insecurity (Conserving and enhancing nutrients: food fortification)
  - Carbon footprint, water footprint, toxicity and waste, soil health
  - Food losses and food waste
  - Food innovation
  - Green Technological Approaches in food industry
  - Catering sector as a sustainable value chain (case study)

### **PRACTICAL (Credits 1: 30 Hours)**

*No. of Students per Practical Class Group: 10-15*

19. Critical evaluation on the following case studies:

- Potato value chain management (Link: <https://www.fao.org/3/i3953e/i3953e.pdf>, Pg. 28 of Neven (2014))
- Dairy value chain management (Link: <https://averdishome.files.wordpress.com/2017/01/sustainable-value-chains-for-sustainable-food-systems.pdf>, Pg. 25 of Maybeck and Redfern (2016).)
- Coffee value chain management (Link: <https://www.fao.org/3/i3953e/i3953e.pdf>, Pg. 49 of Neven (2014))
- Pineapple value chain management (Link: [http://sfacindia.com/PDFs/SFAC\\_Value-Chain-Analysis.pdf](http://sfacindia.com/PDFs/SFAC_Value-Chain-Analysis.pdf))



20. Develop a food value chain flow chart or framework for any farm to plate product such as wheat to bread or tomato to tomato puree.
21. Develop a business proposal for supply chain management of milk or any perishable food.
22. SWOT Analysis of a given food value chain management through a case study (Link: <https://averdishome.files.wordpress.com/2017/01/sustainable-value-chains-for-sustainable-food-systems.pdf>, Pg. 263 of Maybeck and Redfern (2016)).
23. Methodology for determining food waste in college or school canteen.

### ESSENTIAL READINGS (Theory and Practical):

- Neven, D. (2014). *Developing Sustainable Food Value Chains: Guiding Principles*. Food and Agricultural Organization (FAO). Link: <https://www.fao.org/3/i3953e/i3953e.pdf>
- Dani, S. (2021). *Food Supply Chain Management and Logistics*. Second Edition. Kogan Page.
- Meybeck, A. and Redfern, S. (2016). *Sustainable value chains for sustainable food systems*. Food and Agricultural Organization (FAO). Link: <https://averdishome.files.wordpress.com/2017/01/sustainable-value-chains-for-sustainable-food-systems.pdf>
- Stead, V. and Hinkson, M. (2022). *Beyond Global Food Supply Chains: Crisis, Disruption and Regeneration*. First Edition. Palgrave Macmillan Press.
- Pullman, M. and Wu, Z. (2021). *Food Supply Chain Management: Building a Sustainable Future*. Second Edition. Routledge Press.
- Ikavou, E., Bochtis, D., Vlachos, D. and Aidonis, D. (2016). *Supply Chain Management: For Sustainable Food Networks*. First Edition. Wiley Publishers.
- Mena, C. and Stevens, G. (2010). *Delivering Performance in Food Supply Chains*. First Edition. CRC Press.
- Small Farmers Agrobusiness Consortium (SFAC). (2022). *Value Chain Analysis of Select Crops in Northeastern States*. SFAC. Link: [http://sfacindia.com/PDFs/SFAC\\_Value-Chain-Analysis.pdf](http://sfacindia.com/PDFs/SFAC_Value-Chain-Analysis.pdf)

### SUGGESTED READINGS:

- Mor, R.S., Kamble, S.S. and Sangwan, K.S. (2022). *Operations and Supply Chain Management in Food Industry: Farm to Fork*. Springer.
- Lianos, I., Ivanov, A. and Davis, D. (2022). *Global Food Value Chains and Competitive Laws*. First Edition. Cambridge University Press.
- Bourlakis, M.A. and Weightman, P.W.H. (2003). *Food Supply Chain Management*. First Edition. Blackwell Publishing.
- Mukherjee, A., Goyal, T.M., Pal, P. and Deb, S. (2014). *Food Supply Chain in India: Analysing the Situation for International Business*. Academic Foundation.
- Hill, V. (2016). *A Kaizen Approach to Food Safety: Quality Management in the Value Chain from Wheat to Bread*. Springer.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC ELECTIVE – DSE-6-FT:  
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/ Practice		
Research Methods in Home Science	4	3	0	1	XII	NIL

**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.  
To sensitize students towards ethical concerns while conducting Home Science research.

**COURSE OUTCOMES:**

Upon successful completion of this course, students will be able to:

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-6-FT**

**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 (Theory and Practical):

- Kerlinger F. N. and Lee, H.B. (2017). *Foundations of Behavioral Research* 4<sup>th</sup> Ed. Harcourt College Publishers.
- Kothari, C. R. (2019). *Research Methodology: Methods and Techniques*. New Age International Pvt Ltd, New Delhi.
- Kothari, C. R. (2022). *ShodhPadhati* 1<sup>st</sup> Ed. New Age International Pvt Ltd, New Delhi.
- Kumar, R. (2019) *Research Methodology: A Step-by-Step Guide for Beginners*. 5<sup>th</sup> 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](https://www.ugc.ac.in/e-book/Academic%20and%20Research%20Book_WEB.pdf)

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

## **DEPARTMENT OF HOME SCIENCE**

### **B.A (Prog) Food Technology**

## **GENERIC ELECTIVE COURSES (GE)**

### **GENERIC ELECTIVE – GE-1-FT: BASIC BAKING**

#### **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		
Basic Baking	4	3	0	1	Class XII	NIL

#### **LEARNING OBJECTIVES:**

1. To impart students with knowledge related to baking technology.
2. To introduce and equip students to the techniques and skills of cakes, biscuits and pastry making.

#### **COURSE OUTCOMES:**

Upon successful completion of this course, students will be able to:

1. Familiarize themselves with present and future trends of baking industry.
2. Describe the role of ingredients in bakery industry.
3. Demonstrate the skills in preparing cakes, pastries and biscuit, cost control and marketing.
4. Recognize the significance of factors which influence safety of food. Conduct sensory evaluation of bakery products.

#### **SYLLABUS OF GE-1-FT**

### **THEORY (Credits 3: 45 Hours)**

#### **UNIT I: Baking Industry**

**(10 Hours)**

- *Unit Description:* This unit will introduce the students to the field of Food Bakery Science. It will also give information on nutrition facts of Bakery products.
- *Subtopics:*
  - History of bakery - present trends and prospects

- Nutrition facts about bakery products
- Food safety aspects of baked products

## **UNIT II: Cake Processing**

**(14 Hours)**

- *Unit Description:* The unit is about processing of various types of cakes, their labelling, packaging and evaluation.
- *Subtopics:*
  - Preparation of cakes – Ingredients, types of cakes, methods of batter preparation, steps in cake making, balancing of cake formula, evaluation of the baked cake, operational faults in cake processing and the remedial measures.
  - Packaging, labelling, and costing

## **UNIT III: Pastry Processing**

**(6 Hours)**

- *Unit Description:* The unit is about processing of various types of pastries, and their evaluation.
- *Subtopics:*
  - Preparation of pastry – Ingredients, types of pastries (short crust, puff/flaky and choux pastry), processing and evaluation, faults and remedies.

## **UNIT IV: Biscuit and Cookies Processing**

**(15 Hours)**

- *Unit Description:* The unit is about processing of various types of biscuits, cookies and their evaluation.
- *Subtopics:*
  - Preparation of biscuits and cookies – types, ingredients, processing and evaluation.

### **PRACTICAL (Credits 1: 30 Hours)**

*No. of Students per Practical Class Group: 10-15*

1. Weights and measures, selection of raw material.
2. Preparation, sensory evaluation and packaging of cakes.
  - Fatless sponge cakes
  - Shortened cakes
  - Eggless cakes
  - Muffins and brownies
3. Preparation, sensory evaluation and packaging of pastries-
  - Short crust
  - Puff/flaky
  - Choux pastry
4. Preparation, sensory evaluation and packaging of biscuits.

### ESSENTIAL READINGS (Theory and Practical):

- Dubey, S. C. (2016). *Basic Baking: Science and Craft*. Delhi: The Society of Indian Bakers.
- Edward, W. P. (2007). *The Science of Bakery Products*. Cambridge: RSC Publishing.
- Faridi, H. (2004). *The Science of Cookie and Crackers Production*. Delhi: CBS Publishers.
- Ketrapaul, N., Grewal, R.B., Jood, S. (2005). *Bakery Science and Cereal Technology*. Delhi: Daya Publishing House.
- Matz, A. (2008). *Bakery Technology and Engineering*, 10<sup>th</sup> Edition. Delhi: CBS Publishers.
- Suri, S. & Malhotra, A. (2014). *Food Science, Nutrition and Safety*. Delhi: Pearson India Ltd.

### SUGGESTED READINGS:

- Cornell, Hugh, J. & Hoveling, Alber. W. (1998). *Wheat Chemistry and Utilization*, Delhi: CRC Press.
- Edward, W. P. (2007). *The Science of Bakery Products*. Cambridge: RSC Publishing.
- Kent, N.L. (2004). *Technology of Cereals*. London: Pergamon Press.
- Khanna, K., Gupta, S., Seth, R., Mahana, R., & Rekhi, T. (2004). *The Art and Science of Cooking*. Delhi: Phoenix Publishing House Private Limited.
- Matz A. (2004). *The Chemistry and Technology of Cereals as Food and Feed*. Delhi: CBS Publishers.
- Matz, A. (1998). *Bakery Technology and Engineering*. Delhi: CBS Publishers.
- Raina, U., Kashyap, S., Narula, V., Thomas, S., Suvira, Vir, S., & Chopra, S. (2005). *Basic Food Preparation – A Complete Manual*. Delhi: Orient Longman.

**Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.**

**DISCIPLINE SPECIFIC CORE COURSE – GE-2-FT:  
FRUIT AND VEGETABLE PRESERVATION TECHNOLOGY**

**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		
Fruit and Vegetable Preservation Technology	4	3	0	1	Class XII	NIL

**LEARNING OBJECTIVES:**

9. To introduce students to the myriad field of preservation
10. To help students understand the basic principles of fruit and vegetable preservation
11. To help students learn methods and gain skills required for preserving fruits and vegetables
12. To know the regulatory and safety aspects associated with processing preserved products

**LEARNING OUTCOMES:**

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

12. Explain the principles and methods of preserving fruits and vegetables
13. Appreciate the role of food safety regulations in preservation industry
14. Prepare different types of preserved products from fruits and vegetables

**SYLLABUS OF GE-2-FT**

**THEORY  
(Credits 3: 45 Hours)**

**UNIT I: Unit I: Fruit and Vegetable Preservation – an overview (10 Hours)**

- *Unit Description:* This unit will introduce the students to the vast field of food preservation and the salient changes which occur post harvest in fruits and vegetables.
- *Subtopics:*
  - Objectives of preservation and processing
  - Scope of preservation industry in India
  - Physical, chemical and microbiological changes in fruits and vegetables
  - Factors affecting growth of microorganisms and the control measures

**UNIT II: Principles and methods of preservation (12 Hours)**



- *Unit Description:* This unit will explain to the students the principle, advantages and disadvantages of various methods of preservation.
- *Subtopics:*
  - Asepsis
  - Low temperature
  - High temperature
  - Removal of moisture
  - Removal of air
  - Use of chemical preservatives
  - Fermentation
  - Irradiation
  - Newer methods

### **UNIT III: Fruit and vegetable processing**

**(15 Hours)**

- *Unit Description:* This unit will help students learn in detail the methods of preparing safe and good quality preserved products.
- *Subtopics:*
  - Chutney and sauces- Definition, method of preservation, steps in preparation of chutney and sauces.
  - Fruits beverages- Definition and classification, method of preservation (with special emphasis on pasteurization, use of chemical preservatives, sugar), role of various ingredients.
  - Jam, Jelly and Marmalade-definition, role of pectin and theory of gel formation, method of preservation, steps of preparation, evaluation.
  - Preserves- definition, method of preservation, steps of preservation, evaluation, candied, crystallized and glazed fruits
  - Pickles- definition, classification method of preservation steps of preparation of vinegar pickles, evaluation.

### **Unit IV: Food Safety Regulations and procedures**

**(8 Hours)**

- *Unit Description:* This unit will help students learn about the regulatory aspects of preserved food products. The unit will also briefly discuss the practices and programmes which can be adopted to enhance quality of preserved products.
- *Subtopics:*
  - Key terms, factors affecting food safety, recent concerns
  - National food law (FSSA), standards and regulations
  - Food additives and contaminants
  - Good Hygiene Practices
  - HACCP

**PRACTICAL**  
**(Credits 1: 30 Hours)**

Preparation, packaging, labeling, sensory and objective (TSS, p<sup>H</sup>) evaluation of :

1. Sauces and chutnies
2. Ketchup (tomato)
3. Squashes (lemon squash, orange squash, pineapple squash)
4. Syrups (rose syrup and almond syrup)
5. Jams (apple jam and mixed fruits jam)
6. Pickles (green chilli, lemon, mixed vegetable)
7. Preserve (carrot)

### ESSENTIAL READINGS (Theory and Practical):

- Rao, E.S., Garg, M. and Barwa, M.S. (2023). *Handbook on Processing and Preservation of Fruits and Vegetables*. 2nd edn. Variety Books Publisher's Distributors, New Delhi
- Frazier, W.C. and Westhoff, D.C. (2014). *Food Microbiology*. Chennai: Tata McGraw Hill Publishing Company Limited.
- Fellows, P.J. (2022). *Food Processing Technology Principles and Practice*. 5th edn. Woodhead Publishing Series in Food Science, Technology and Nutrition. <https://doi.org/10.1016/C2019-0-04416-0>.
- Rahman, M.S. (Ed.). (2020). *Handbook of Food Preservation*. 3rd edn. CRC Press. <https://doi.org/10.1201/9780429091483>
- Suri, S. & Malhotra, A. (2014). *Food Science Nutrition and Safety*. Delhi: Pearson India Ltd.
- Sivasankar, B. (2002). *Food Quality, in Food Processing and Preservation*. Prentice-Hall of India Private Limited, New Delhi.
- Srivastava, S.S. (2006). *Phal Parirakshan*. Lucknow: Kitab Mahal.

### SUGGESTED READINGS:

- Potter, N.N., and Hotchkiss, J.H. (2012). *Food Science*. 5<sup>th</sup> edn. Springer New York, NY. XV, 608. <https://doi.org/10.1007/978-1-4615-4985-7>.
- Lal, G., Siddhapa, G.S. and Tandon, G.L. (2009). *Preservation of Fruits and Vegetables*. New Delhi: Indian Council of Agriculture Research.
- Subbalakshmi, G., and Udipi, S.A. (2007). *Food Processing and Preservation*. Delhi: New Age International Publishers.
- Khurdia, D.S. (1995). *Preservation of fruits and vegetables*. New Delhi: Indian Council of Agriculture Research.

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**GENERIC ELECTIVE – GE-3-FT:  
ENTREPRENEURSHIP FOR SMALL SCALE CATERING**

**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		
Entrepreneurship for Small Scale Catering	4	3	0	1	Class XII	NIL

**LEARNING OBJECTIVES:**

1. To introduce the students to the field of food business and cafeteria management
2. To impart knowledge about different types of food business, types of cafeteria and their management
3. To impart practical skills in preparation of project report for business plans, planning and organization of different cafeterias and quantity food production

**LEARNING OUTCOMES:**

After successfully completing the course, the students will be able to:

1. Describe various types of food businesses and develop food business plans.
2. Know the government regulations for food business and concept of quality management.
3. Plan and execute menus for different types of cafeterias.
4. Develop business plan to set up a successful small scale food business/cafeteria.

**SYLLABUS OF GE-3-FT**

**THEORY  
(Credits 3: 45 Hours)**

**UNIT I: Food Business Management**

**(15 Hours)**

- *Unit Description:* This unit will introduce students to the concept of different types of food business, business plans, business ethics and food regulations
- *Subtopics:*
  - Case studies of food businesses and its aspects, Types of Food Businesses
  - Market assessment techniques and preparation of a food business plan.
  - FSSAI regulations for Food Businesses
  - Business ethics and Quality Management.

**UNIT II: Cafeteria Management****(15 Hours)**

- *Unit Description:* This unit will introduce students to the concept of different types of cafeterias and their management.
- *Subtopics:*
  - Types of Cafeterias and Type of Services
  - Resources- Finance, Human Resource, Equipment, Infrastructure and facilities
  - Organizational goals, structure and salient responsibilities of staff and management
  - Menu Planning- types of menus, factors affecting menu planning.
  - Food Purchase and Storage
  - Quantity Food production

**Unit III: Operational Management in food industry****(15 Hours)**

- *Unit Description:* Through this unit the student will learn about efficient administration of business practices which is the primary responsibility of an operational manager. The chapter will discuss about the various aspects of operational management which can lead to enhanced quality and productivity in an efficient manner.
- *Subtopics:*
  - Importance of operations manager and operational management in food industry (models/process)
  - Job Analysis and description (ergonomics, role of duty rosters and SOP), work design and work measurement
  - Material Management (purchase, store, inventory, standardization)
  - Improving productivity (forecasting, scheduling and controlling production activities) System design and capacity planning
  - Food Safety Management System
  - Role of automation and Artificial Intelligence in operational management

**PRACTICAL****(Credits 1: 30 Hours)***No. of Students per Practical Class Group: 10-15*

1. Market Survey for identification of food business opportunities
2. Preparation of a food Business plan
3. Planning and organization for industrial cafeteria
4. Planning and organization for hospital cafeteria
5. Planning and organization for cafeteria in a mall/market
6. Planning and organization for cafeteria in a corporate office/ Airport
7. Setup and display of daily menus
8. Quantity Food Production

## 9. Management of a Cafeteria

### ESSENTIAL READINGS (Theory and Practical):

1. Sethi, M. (2016). *Institutional Food Management*. Delhi, New Age International Publishers, India
2. Taneja, S. & Gupta, S.L. (2017). *Entrepreneur Development*. Galgotia Publishing Company, Delhi, India.
3. Bali, P.S. (2011). *Quantity Food Production Operations and Indian Cuisine*. Oxford University Press, India.
4. Warner, M. (2016). *Industrial Food Service and Cafeteria Management*. Cahnerns Books, Boston.

### SUGGESTED READINGS:

1. Andrews, S. (2008). *Food and Beverage Management*. Tata McGraw-Hill Publishing Company Limited, New Delhi, India.
2. PaynePalacio, J. & Theis, M. (2015). *Food Service Management: Principles and Practices* (13th edition). Pearson.
3. Dessler, G. (2007). *Human Resource Management* (11th edition). Prentice Hall, New Jersey.
4. Luthans, F. (2004). *Organisational Behaviour* (10th edition). McGraw Hill International.

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**GENERIC ELECTIVE – GE-4-FT:  
FOOD QUALITY MANAGEMENT**

**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		
Food Quality Management	4	3	0	1	Class XII	NIL

**LEARNING OBJECTIVES:**

1. To introduce students to the field of food quality management
2. To impart knowledge on basic concepts of quality and safety in the food sector
3. To familiarize the students with the approaches, principles and programs which facilitate food quality management.
4. To help students understand the basics of preparing, evaluating and implementing a food quality policy on an on-going basis.

**LEARNING OUTCOMES:**

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

1. Explain the association of food quality with food safety.
2. Appreciate the need for having a quality policy and work-specific standard operating guidelines in food-based organizations.
3. Contribute enthusiastically to the food quality management system.
4. Facilitate the development, implementation and evaluation of quality policy.

**SYLLABUS OF GE-4-FT**

**THEORY  
(Credits 3: 45 Hours)**

**UNIT I: Food Quality and Food Safety – an overview (18 Hours)**

- *Unit Description:* This unit will introduce the students to the vast and emerging field of food quality, managing quality during food handling and its association with food safety.
- *Subtopics:*
  - Introduction to basic terms (quality, food quality, quality control, quality assurance, quality improvement, quality planning, quality assessment, quality management)
  - Characteristics of quality
  - Food quality attributes – Intrinsic and Extrinsic
  - Food quality management – scope (consumer and business perspectives)

- Role of food safety in food quality
- Food safety hazards and the role of FSSAI

### **UNIT III: Approaches to management of food quality**

**(17 Hours)**

- *Unit Description:* This unit will explain to the students how a combination of approaches in different situations can help in managing resources and processes to result in achieving, maintaining, enhancing quality of food.
- *Subtopics:*
  - Quality control
  - Quality assurance
  - Total quality management
  - Quality management system

### **UNIT III: Quality management programs and standards for food industry (10 Hours)**

- *Unit Description:* This unit will discuss the principles, procedures which can be followed in principle to maintain and achieve higher standards by the food industry.
- *Subtopics:*
  - HACCP (origin, key terms, principles, development and implementation and maintenance)
  - Codex Alimentarius 12 steps for application of HACCP
  - Quality management standards (ISO quality system standards eg; 9000:2000, 9001:2000, 9004:2000)
  - Procedures for auditing and certifications

### **Unit IV: Food quality policy and strategy**

**(10 Hours)**

- *Unit Description:* Every food handling/processing unit must have a quality policy on the basis of which strategic plan of action can be made and implemented. This unit will help students understand how to prepare, evaluate and implement a quality policy.
- *Subtopics:*
  - Quality policy and strategy process (activities and decisions)
  - Quality policy and technological conditions
  - Tools and methods for quality strategy and policy
  - Organizational structure and procedures (Crosby's maturity grid, collaboration in food chain)
  - Quality cost analysis
  - Quality policy evaluation
  - Challenges in executing sustainable FQM

### **PRACTICAL (Credits 1: 30 Hours)**

*No. of Students per Practical Class Group: 10-15*

24. Identification and removal of physical hazards rice grains, tea leaves, whole wheat flour and pulses.
25. Identification of microbes/parasites by use of prepared slides and specimens.
26. Develop educational aid on general principles of GMP.
27. Develop HACCP program for college canteen.
28. Project on developing a food quality management system for a bakery or milk/vegetable booth/canteen/food kiosk
29. Case study on quality policy of a multi-national food processing company

### **ESSENTIAL READINGS (Theory and Practical):**

- Alli. I. (2003). Food Quality Assurance – Principles and Practices, CRC Press.
- Suri, S and Malhotra, A. (2014). Food Science, Nutrition and Safety. Dorling Kindersley Pvt. Ltd. (Pearson) India.
- Mathur, P. (2018). Food Safety and Quality Control. Orient Blackswan Private Limited.
- Pieterneel A.L and Willem J.M. (2020). Food Quality Management – Technological and Managerial Principles and Practices

### **SUGGESTED READINGS:**

- Ronald F. Cichy, and Jae Min Cha. (2009). Food Safety and Quality Management, American Hotel and Lodging Educational Institute.
- Knechtges, L.I. (2012). Food Safety-Theory and Practice, USA: Jones and Barlette Learning.
- Kalia, M. (2010). *Food quality management*. Agrotech Pub. Academy.

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## GENERIC ELECTIVE – GE-5-FT: TRADITIONAL INDIAN FOODS

### 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		
Traditional Indian Foods	4	3	0	1	Class XII	NIL

### LEARNING OBJECTIVES:

1. Impart knowledge about the background and benefits of traditional foods of India.
2. Prepare traditional regional Indian dishes using basic principles of cooking.

### COURSE OUTCOMES:

After successful completion of the course, the students will:

1. Get appraised to the basic concepts of indigenous Indian foods by ancestors.
2. Have theoretical and practical knowledge about the rich food heritage of India.
3. Based on available resources judiciously adopt cooking healthier traditional foods of India.
4. Be able to work/contribute/ promote the food industry catering to traditional Indian foods.

### SYLLABUS OF GE-5-FT

#### THEORY (Credits 3: 45 Hours)

#### UNIT I: Traditional foods of India – An Introduction (5 Hours)

- *Unit Description:* This unit would help students learn about the rich food culture/ background of traditional foods, the concepts of common food beliefs and the journey of traditional foods over the years.
- *Subtopics:*
  - Ancestral food legacy
  - Historical Background (Aryans, Vedic and Harappans)
  - Common food beliefs
  - Roots to routes – future prospects

#### UNIT II: Traditional Cooking Methods and Equipment (10 Hours)

- *Unit Description:* This unit will help students understand the traditional Indian equipments and methods used to cook food; their advantages and disadvantages.
- *Subtopics:*
  - Common traditional equipments and utensils
  - Common traditional cooking methods

### **UNIT III: Traditional Regional Cuisines**

**(20 Hours)**

- *Unit Description:* The unit is based on the diverse traditional regional cuisines/ foods. It will help student understand that the traditional food as available today has evolved over the year as a result of various socio-demographic, political and other factors.
- *Subtopics:*  
Traditional menus, meals, snacks and desserts of following:
  - Northern India
  - Southern India
  - Central India
  - Eastern India
  - Western India

### **UNIT IV: Traditional Foods – Health and Disease**

**(10 Hours)**

- *Unit Description:* The unit will discuss about the health-promotive properties of salient indigenous foods of India as well as the concepts of traditional dietary regimes.
- *Subtopics:*
  - Spices, herbs and condiments
  - Hot and cold foods
  - Satvik, Rajsik, Tamsik
  - Fasting and feasting.

### **PRACTICAL (Credits 1: 30 Hours)**

*No. of Students per Practical Class Group: 10-15*

5. Weights, measures and common food hygiene practices.
6. Basic cooking terminologies and market order preparation.
7. Visit to state houses/bhawans/dilli haat
8. Northern Region:
  - 2 snacks: kathi kebab/galouti kebab/moong daal kachori/samosa/palak pakoras
  - 1 main dish: sarso ka saag, makka ki roti/ bajre ki khichdi singhri ki sabzi/Jammu rajma/bedmi poori
  - 1 dessert: kheer/laddoo/pinni/phirni/ halwa

9. Eastern region:
  - 2 snacks: bhujia/puchka/pitthas/dhuska
  - 1 main dish: littichokha/macher jhol/luchi/potala rasa/
  - 1 dessert: rajbhog/thekua/sandesh/khaja/pitha/kakara.
10. North-Eastern region:
  - 2 snacks: pitha/sanpiau/momos/zan/sha phaley/koatpitha
  - 1 main dish: steamed fish/gyathuk/chamthong/panchphoran tarkari
  - 1 dessert: pukhlein/kabok/guroorpayash/xutulipitha/sel roti
11. Central region:
  - 2 snacks: bafauri/faraa/moong-bara/muthia/indori poha
  - 1 main dish: dubki-kadhi/suran/dal-bafla
  - 1 dessert: tilgur/indori jalebi/khurma/pooran-poli
12. Western region:
  - 2 snacks: fafda/batata vada/vada pav/mirchivada/bonda
  - 1 main dish: Gujrati kadhi/khaman with curry/dal bati
  - 1 dessert: basundi/shrikhand/kulkul/choorma laddoo
13. Southern region:
  - 2 snacks: murukku/idli/elaada/ribbon sev
  - 1 main dish: idiyappam/dosa/avial/rasam/uttapam/ Hyderabad  
biryani/bisibele bath
  - 1 dessert: moong dal payasam/sweet pongal/boorelu/ khubani- ka-meetha

### ESSENTIAL READINGS (Theory and Practical):

- Acharya, K.T. (2000). Indian Food: A Historical Comparison. Oxford Press.
- Nandrajog, H. & Suri, S. (2021). The Saga of Food: Reflections on Technology and Culture. International Book House.
- Khanna K, Gupta S, Seth R, Mahna R, Rekhi T. (2004). *The Art and Science of Cooking: A Practical Manual*, Revised Edition. New Delhi: Elite Publishing House Pvt Ltd.
- Raina, U., Kashyap, S., Narula, V., Thomas, S., Suvira, Vir, S., & Chopra, S. (2005). Basic Food Preparation – A Complete Manual. Delhi: OrientLongman.

### SUGGESTED READINGS:

- Sen, C.T. (2005). Food Culture in India. Greenwood Press.
- Davidar, R.N. (2001). Indian Food Science: A Health and Nutrition Guide to Traditional Recipes. East West Books.
- Sanghvi, V. (2019). The Indian Pantry: The Very Best of Rude Food. Penguin Publishers.
- Ayushman Systems of Medicine. Traditional Food Recipes. Ayushman Bharat. Ministry of Ayush. Government of India.  
Website: [https://ayushportal.nic.in/pdf/Food\\_Recipes\\_From\\_AYUSH.pdf](https://ayushportal.nic.in/pdf/Food_Recipes_From_AYUSH.pdf).
- Garg, A.K., Chouhan, P. & Adlakha, M.K. (2018). Traditional Dietary Pattern of Indian Food & it's Scientific Basis: Diversity in Indian Cuisine and its Health Benefits. LAP Lambert Academic Publishing.
- Food Safety and Standards Authority of India (FSSAI). (2020). The Eat Right India Handbook. First Edition.

Website: <http://www.indiaenvironmentportal.org.in/files/file/The-Eat-Right-India-Handbook.pdf>.

- Spencer, S. (2018). Totally Indian: Quick and Easy Traditional Indian Food Recipes (Flavors of the World). The Cookbook Publisher.
- Sen, CT. (2016). Feast and Fasts: A History of Food in India. Speaking Tiger.
- Basic Food Preparation – A Complete Manual. Delhi: Orient Longman.

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**REGISTRAR**