UNIVERSITY OF DELHI

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

Dated: 29.12.2023

N O T I F I C A T I O N

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		
FOOD QUALITY MANAGEMENT	4	3	0	1	XII Pass with PCM/PCB	NIL

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, alloys, 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

- Pieternel 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, 3rd 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

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 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

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 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.
- Kottler (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: Mc Graw 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, 5th 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

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 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* 2nd 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 β-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

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 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_2 and O_2 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.

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Suggested Readings

- Daniel, Lu. and Wong, D. (Eds). (2017). *Materials for Advanced Packaging. S*pringer
- 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

- Introduction, classification **10 Hours**
- 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. 3rd 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.

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 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		
FOOD SAFETY	4	3	0	1	XII Pass with PCM/PCB	Nil

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

Suggested Readings:

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

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-requisiteof 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.

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 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 λ_{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, (6th 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 (3rd 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 (15th ed.), Pearson Education, India.
- Kulkarni, S. K., 2014, Nanotechnology: Principles & Practices (3rd ed.), Capital Publishing Company, New Delhi.
- Lancaster, M., 2016, Green Chemistry: An Introductory Text (2nd ed.), RSC Publishing, U.K.
- Poole, C.P., Frank, Jr. and Owens, J., 2003, Introduction to Nanotechnology (1st 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 (7th ed.), Pearson Education, New Delhi.
- Sharma, S.P., 2003, Basic Radio and Television (2nd ed.), Tata McGraw Hill, India.
- Singh, H., 2001, B.Sc. Practical Physics, S. Chand and Co., New Delhi.
- Solomon, T.W., 2017, Organic Chemistry (12th 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.

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 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
- 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/
- 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

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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 metrices.

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). T*he 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.

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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.

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 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		
Dietetics and Public Health Nutrition I	4	3	0	1	XII Pass	Appeared in Nutrition: A Life Cycle Approach

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, 1st 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.ilsi-india.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. 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.Assessed on March 2023
- 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).Assessed on March 2023
- NFHS Project | International Institute for Population Sciences (IIPS) (iipsindia.ac.in).Assessed on 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 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%2 0Act%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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University of Delhi, from time to time.

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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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. 2nd 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. 3rd 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. 1st 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. 1st 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		
Gender, Media and Society	4	2	0	2	XII Pass	Appeared in Communication Concepts and Theories

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 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		
New Media for Change	4	2	0	2	XII Pass	Appeared in Communication Concepts and Theories

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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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, 6th 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 Butterwroths.
- 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 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, 6th 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.

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 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.
- Chabbra 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**
   - Tie & dye using various techniques on cellulosic and protein fibers
   - Batik on cotton
2. Printing **4**
   - Block printing: pigment
   - Screen printing: pigment
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
- Chattopadhaya, 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.
- 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.

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

Suggested Readings:

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

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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.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	Tutoria	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.

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 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.

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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		
Communication Systems	4	3	0	1	XII Pass	Appeared in Fundamentals of Communication

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

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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		
Adolescent Relationships and Wellbeing	4	2	0	2	XII Pass	Pass in Lifespan Development II: Middle Childhood and Adolescence

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, 26th 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, 10th Edition, Addison-Wesley.
- Park JE and Park K (2021). Park's Textbook of Preventive and Social Medicine, 26th ed
- Bedi YP (2018), 17th Edition Handbook of Preventive and Social Medicine: Community Health/Community Medicine
- Practical Workbook of Human Physiology, K Sri Nageswari and Rajeev Sharma, 2nd Edition 2018
- Textbook of Practical Physiology, G K Pal and Pravati Pal 5th Edition (2020)
- A Textbook of Practical Physiology, CL Ghai, 8th Edition, (2013)

Suggested Readings:

- Ross and Wilson (2018). Foundation of Anatomy and Physiology, Medical Division 12th 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 (Accessed March 19th 2023)
- 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 (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. 3rd 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		
Fabric Construction	4	2	0	2	XII Pass	NIL

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 Butterwroths.
- 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.
- Aquire 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*. (10th 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 printingof 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
- Chattopadhaya, 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

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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., Sriniwas R., K. Sridevi, (2019) Introduction to Disabilities. 1st 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/
- 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
- 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.

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 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 (Km and Vmax)

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.

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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.

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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 1*. 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
- 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
- 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, 7th edition, Pearson Education, USA
- Armstrong, H.J., 2009, *Pattern Making for Fashion Design*, 5th 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

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 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- Un derstanding 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.
- Chabbra T. N. (2015). *Entrepreneurship Development*. Sun India.

- Charantimath, P. M. (2018*). Entrepreneurship Development and Small Business Enterprise*s. 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		
Lifespan Development III: Development in Adulthood	4	3	0	1	XII Pass	Appeared in Lifespan Development II: Middle Childhood and Adolescence

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

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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		
Public Nutrition and Dietetics	4	3	0	1	XII Pass	Appeared in Lifespan Approach to Nutrition

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: Banarasidas Bhanot Publishers.
- Seth, V. and Singh K. (eds.) (2021) Principles of Medical Nutrition Therapy for Positive Clinical Outcomes, 1st 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 th 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. & Brahmam, 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)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).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 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 .Assessed on March 2023
- NFHS Project | International Institute for Population Sciences (IIPS) (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		
Sociology and Psychology for Home Science	4	2	0	2	XII Pass	NIL

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, Saundra 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.*

Orient Blackswan.

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

Suggested Readings:

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

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		
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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