

B.SC. HOME SCIENCE (PROG.)

DISCIPLINE SPECIFIC CORE COURSE

DSC HP 307 : Fundamentals of 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 | | |
| Fundamentals of Textiles | 4 | 3 | 0 | 1 | XII Pass | Pass in DSC HP 102 Fashion Concepts |

Learning Objectives

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

Learning Outcomes

After completing this course, students will be able to:

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

SYLLABUS OF DSC HP 307

THEORY

(Credits 3; Hours 45)

UNIT I: Introduction to Textile Fibres

6 Hours

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 Polymerization, Crystalline and Amorphous Regions, Orientation
- Primary and secondary properties
- Fiber classification

UNIT II: Production, Chemistry, Properties and Usage of Fibers

12 Hours

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

- Natural fibers: Cotton, Flax, Silk, and Wool
- Man-made fibers: Rayon, Nylon, Polyester, Acrylic, and Elastomeric fibers

UNIT III: Production and Properties of Yarns **8**

Hours

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
- Yarn Properties: Yarn Twist and Balance, Yarn Count

UNIT IV: Techniques of Fabric Construction

11 Hours

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 Wet Processing

8 Hours

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
(Credit 1; Hours 30)

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

Essential Readings

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

Suggested Readings

1. Collier B. & Tortora G. Phyllis. (1997). *Understanding Textiles*. USA: Merrill.
2. Hollen, N. and Saddler, J. (1979). *Textile*. New York: Mcmillan.

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 308 : Personal Finance and Consumer Education

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 Education | 4 | 3 | 0 | 1 | XII Pass | Pass in DSC HP 101 Introduction to Resource Management |

Learning Objectives

1. To provide students' an understanding of income, saving and investment management in the changing socio-economic environment.
2. To acquaint students with the concept of consumers' role in an economy, consumer problems, education and empowerment.
3. To comprehend issues related to consumer protection, legislative measures and redressal mechanisms.
4. To provide insights and practical knowledge of critically evaluating and designing various consumer aids.

Learning Outcomes

1. After completing this course, students will be able to:
2. Gain knowledge of income, saving and investment management in the changing socio-economic environment.
3. Understand the role of consumer in the economy, consumer problems, education and empowerment.
4. Comprehend issues related to consumer protection, legislative measures and redressal mechanisms.
5. Gain practical knowledge of critically evaluating and designing various consumer aids.

SYLLABUS OF DSC HP 308

THEORY (Credits 3; Hours 45)

UNIT I: Income and Expenditure

15 Hours

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

Subtopics:

- 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 in understanding the consumer problems faced, role of consumer education and empowerment in today's context.

Subtopics:

- 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

9 Hours

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

Subtopics:

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

UNIT IV: Legislative framework for consumers protection

9 Hours

The unit focuses on the legislative frameworks, acts and redressal mechanisms available for consumers for their protection.

Subtopics:

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

PRACTICAL (Credit 1; Hours 30)

- Understanding and designing standardization marks.

- Evaluation and designing of informative and attractive labels of different types of products.
- Evaluation and designing of advertisements in the print media including products, services and social ads.
- Case study of banks and post offices to understand their services and products.
- Learning to fill different bank forms.
- Analysis of consumer redressal through case study approach.
- Food adulteration tests.

Essential readings

1. Mital, M., Sawhney, H. K. (2015). *Family Finance and Consumer Studies*. New Delhi: Elite Publishing House Pvt. Ltd.
2. Mital M., Jain, S., & Mehta, C. (2015). *Family finance and Consumer Studies: A Practical Manual, Second Edition*. New Delhi: Elite Publishing House Pvt. Ltd.
3. Seetharaman, P. and Sethi, M. (2001). *Consumerism: Strength and Tactics*. New Delhi: CBS Publishers.

Suggested readings

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

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 309 : Introductory 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 | | |
| Introductory Physical Science for Home Science | 4 | 2 | 0 | 2 | XII Pass | NIL |

Learning Objectives

1. To develop basic understanding of different chemical and physical concepts and to relate them with everyday life.
2. To enhance skills of students in handling different equipment.

Learning Outcomes

The students would be able to:

1. Study about different chemicals/compounds, their reactions and applications in everyday life.
2. Correlate structures of compounds with their properties and functions.
3. Develop understanding of the basic principles, theories and laws of physics and correlate them with real life situations.
4. Acquire ability to demonstrate basic experimental skills, handling different equipment and understand their working principles.
5. Apply the basic knowledge to different fields of home science.

SYLLABUS OF DSC HP 309

THEORY
(Credits 2; Hours 30)

Section A-Chemistry

UNIT I: Basic Concepts of Chemistry

10 Hours

Fundamental concepts like solutions, nature of substances and organic chemistry

Subtopics:

- Solutions- Properties of water, types of solutions, ways of expressing concentrations of solutions (normality, molarity, strength), colloids (types, properties and applications of colloids)
- Acids and bases – Definition (Arrhenius, Lewis and Bronsted), examples and applications in daily life, pH, pH scale, buffer solutions and pH measurement
- Oxidising and reducing agents - Oxidation and reduction, antioxidants, examples and applications
- Organic Chemistry – Tetravalency of carbon, catenation, functional groups, types of organic compounds and their importance, nomenclature (examples- alkanes, alkenes, alkynes, alcohols, alkyl halides, aldehydes, ketones, amines, acids and esters).

UNIT II: Important Chemical Compounds

6

Hours

Cleaning agents and biomolecules

Subtopics:

- Surfactants – Soaps and synthetic detergents (structure, cleansing action and their applications)
- Disinfectants – Commonly used disinfectants and their hazards, eco-friendly disinfectants
- Dyes- Classification of dyes, natural dyes
- Biomolecules - Importance of carbohydrates, lipids, proteins and nucleic acids.

Section B-Physics

UNIT III: Mechanics and electricity

10 Hours

Basics of mechanics and electricity

Subtopics:

- Measurements of Physical Quantities- Units and dimensions
- Different types of motions- Translational motion, Circular motion, rotational motion, oscillatory motion and their applications
- Elasticity, stress, strain, elastic limit, Hooke's law, stress-strain diagram, Young's modulus, Shear modulus and Bulk modulus
- Concept of current, voltage and Ohm's law. Heating and magnetic effect of current
- Alternating Current, AC motor, comparison between alternating current and direct current
- Electrical Protection: Fuses and disconnect switches, circuit breakers, Earthing
- Estimation of electrical energy used and concept of star rating of household equipment
- Renewable energy- Solar energy, Wind energy, hydro energy, geothermal energy

UNIT IV: Heat, Optics and Sound

4 Hours

Basics of heat, optics and sound

Subtopics:

- Temperature and its measurements
- Calorimetry, change of state with applications
- Heat transfers and thermal conductivity
- Sound waves, production and properties
- Spectrum of light, basics of diffraction and interference

PRACTICAL
(Credits 2; Hours 60)

Section A- Chemistry

- Safe handling and disposal of chemicals generally used in chemical laboratories
- Calculation and preparation of standard solutions (Sodium chloride, sodium bicarbonate)
- Determination of pH of different solutions
- Experiments using Analytical techniques:
 - Acid-base titrations
 - Redox titrations
 - Estimation of salinity in saline water
 - Determination of hardness of water using complexometric titration

Detection of functional groups- Acids, Alcohols, Aldehydes and Ketones

Qualitative tests for carbohydrates

Section B- Physics

- Basic mathematical concepts and study of different types of experimental errors, their reporting and graphing techniques
- Study of least count of different measuring instruments and familiarization of multimeter
- Measurement of volume of the given cylinder using Vernier calliper
- Measurement of area of cross section of a rod and a wire using screw gauge
- Determination of elastic constants of a wire by Searle's method
- Comparison of thermometric scales of temperature using graph method and verification of Newton's law of cooling
- Study of different types of lenses and determination of focal length of double convex lens by one pin method
- Setting up of two way lighting circuit and calculation of cost of electricity consumed
- Verification of Ohm's law and to determine the resistance of a conductor using graph method.
- Study of the voltage and current of the solar cells.
- Demonstration of colour measurement using colorimeter.

Essential readings

1. Ahluwalia V. K. Dhingra, S. and Gulati, A. (2005). College Practical Chemistry, University Press (India) Pvt. Ltd., New Delhi.
2. Bahl A. and Bahl B.S. (2016). A textbook of Organic Chemistry. S. Chand and Sons, New Delhi.
3. Boyle G. (2012). Renewable Energy, Power for a sustainable future 3rd Ed. Oxford University Press, U.S.A.
4. Gomber K.L., Gogia K.L. (2015). Fundamental Physics. Pradeep publications, Jalandhar.
5. Sharma P. and Pathania. (2016). Principles of Physical Chemistry. Vishal Publishing Company, New Delhi.
6. Sukhatme, S.P. and Nayak, J. K. (2017). Solar energy. Tata McGraw - Hill Publishing Company Ltd., India.
7. Walker, J., Resnick, R., Halliday, D. (2013). Fundamentals of Physics. Wiley, United States.

Suggested readings

1. Bahl A. and Bahl B.S. (2012). Advanced Organic Chemistry. S. Chand and Sons, New Delhi.
2. Jacob T. (1979). Textbook of Applied Chemistry. McMillan India Ltd., Noida.
3. Lal S. (1995). Fundamental Physics. Pradeep Publication, Delhi.
4. Morrison and Boyd. (2011). Organic Chemistry. Pearson Education, New Delhi.
5. Singh H. (2001). B.Sc. Practical Physics. S. Chand and Co., New Delhi.
6. Vogel (2009). Quantitative Chemical analysis. Pearson Education, New Delhi.

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