

**DISCIPLINE SPECIFIC ELECTIVE COURSE**  
**DSE HH 7D2: DYEING, PRINTING AND FINISHING**

**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		
Dyeing, Printing and Finishing DSE HH 7D2	4	2	0	2	Studied Textile Science DSC HH 410	Nil

### Learning Objectives

- To gain knowledge of the fundamentals of dyeing and printing on textiles.
- To analyse the application of different dyes on various textile substrates.
- To study various kinds of finishing processes on textile fabrics.

### Learning Outcomes

- Understand the chemistry of various dye classes.
- Describe the process of dyeing and printing various fibres with different dyes.
- Describe methods and styles of printing fabrics.
- Understand concepts of mechanical and chemical finishing of textiles.

### SYLLABUS OF DSE HH 7D2

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

#### UNIT I: Dyeing

**10 Hours**

In this unit, the students will learn about the chemistry and application of various dye classes on various fibre substrates.

- Theory of dyeing
- Chemistry and application of various dye classes: Direct, Reactive, Vat, Azoic, Sulphur, Acid, Basic, Disperse
- Natural Dyes and Mordants: Plant dyes, Mineral based dyes, Animal dyes

**UNIT II: Printing****10 Hours**

In this unit, the students will learn about the various methods and styles of printing and printing of various textile substrates.

- Methods of printing: Block, Roller, Screen (flatbed, rotary)
- Styles of printing: Direct, Resist, Discharge, Transfer, Digital, Flock
- Finishing and after treatment of printed goods: Ageing, Steaming, Baking, washing-off

**UNIT III: Measurement of Colour and Colour Fastness****4 Hours**

In this unit, students will gain an understanding of the concept and measurement of colour fastness

- Colour theory
- Concept of colour measurement: Optical density, K/S,  $L^*a^*b^*$ ,  $L^*c^*h^*$  values
- Principle of colour fastness and its measurement: Wash, Light, Rub, Perspiration

**UNIT IV: Finishing****6 Hours**

In this unit the students will learn about the chemistry and function of various common finishes applied to textiles

- Classification of finishes
- Preparatory finishes: For Cellulosic, Proteins and Synthetic fibres
- Aesthetic Finishes
- Functional Finishes

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

1. Preparatory Finishing: Cellulosic and Protein fibres
  - Desizing
  - Scouring
  - Bleaching
  - Mercerisation
2. Dyeing
  - Cotton using Direct, Reactive, Vat and Azo dyes
  - Silk and wool using Acid, Basic and Reactive dyes
  - Acrylic using Basic Dyes
  - Polyester using Disperse dyes
  - Selected natural dyes on cotton
3. Printing
  - Screen Printing of cotton using Direct, Reactive and Azoic dyes
  - Resist printing of cotton using Azo dyes

- Discharge printing of cotton using Direct dyes

#### 4. Colour Fastness Measurement

- Wash fastness
- Crock fastness
- Perspiration fastness

#### 5. Colour Measurement

- Optical Density
- K/S
- L a\*b\*
- L c\*h\*

### Essential Readings

- Trotman, E. R. (1984) *Dyeing and Chemical Technology of fibres*, Sixth edition, England: Charles Griffin and Company Ltd.
- Rastogi, D. and Chopra, S.(Eds.) (2017)*Textile science*, India: Orient Black Swan Publishing Limited
- Miles, L.W.C. (1994) *Textile Printing*, 2nd ed., West Yorkshire: Society of Dyers and Colorists, England.
- Sekhri S. (2022) *Textbook of Fabric Science: Fundamentals to finishing, 4th ed.*, PHI Learning Pvt. Ltd. Delhi
- सेखड़ी सीमा, (2022) वस्त्र ववज्ञान, PHI Learning Pvt. Ltd. Delhi

### Suggested Readings

- Aspland J. R., (1997) *Textile Dyeing and Colouration*, NC: AATCC.
- Clarke, W. (1977) *An Introduction to Textile Printing*, London: Butterworth and Co. Ltd.
- Shenai, V.A. (1987) *Chemistry of Dyes and Principles of Dyeing*, Vol II, Bombay: Sevak Publications.
- Shore, John (Ed) (1990) *Colorants and Auxiliaries: Organic Chemistry and Application Properties*, Vol. 1 & 2, West Yorkshire: Society of Dyers and Colorists, England.

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