



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Diploma Engineering

Level: Diploma

Branch: Computer Aided Costume Design and Dress Making

Subject Code: DI05051031

Subject Name: Functional Clothing

w. e. f. Academic Year:	2026-27
Semester:	5 th
Category of the Course:	PEC-03

Prerequisite:	Students should have basic knowledge of textiles and fabric properties, garment construction and sewing techniques and fundamental design principles. An understanding of body measurements, comfort and functional clothing needs will support learning in this course.
Rationale:	Costume design and dress making course acquaint the students with knowledge of designing garments that meet specific performance needs such as protection, comfort and safety. It helps students understand the relationship between fabric properties, user requirements and environmental conditions. The syllabus covers classification, material selection and design considerations, enabling practical and industry-oriented learning & preparing students for careers in technical textiles, sportswear, medical clothing and advanced apparel design industries.

Course Outcome:

After Completion of the Course, Student will able to:

Sr. No.	Course Outcomes	RBT Level
01	Understand functional clothing and its importance in various fields.	U
02	Identify the key factors affecting the selection of functional clothing.	R
03	Classify Functional Clothing based on fabric selection.	U
04	Apply design considerations to create suitable functional clothing for different user needs and applications.	A
05	Analyze functional requirements of clothing for various special groups.	N

**Revised Bloom's Taxonomy (RBT)*

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Tutorial / Practical		
				ESE (E)	PA(M)	PA(I)	ESE (V)	
3	0	2	4	30	70	20	30	150



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Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	Introduction to Functional Clothing 1.1 Introduction to Functional Clothing 1.2 Characteristics of Functional clothing. 1.3 Classification of Functional Clothing based on: 1.3.1 Protective 1.3.2 Medical 1.3.3 Sports 1.3.4 Occupational 1.4 Classification based on Functions & Performance Requirements. 1.4.1 Thermal 1.4.2 Moisture 1.4.3 Protection 1.4.4 Comfort	10	22
2.	Factors Affecting Selection of Functional Clothing 2.1 Factors Affecting Selection of Functional Clothing 2.1.1 Climate 2.1.2 Occupation 2.1.3 Age 2.1.4 Gender 2.1.5 Economics 2.1.6 Aesthetic factors 2.1.7 Maintenance and durability 2.1.8 Special finishes and smart features	5	12
3.	Fabric Selection for Functional Clothing 3.1 Importance of Fabric Selection 3.2 Fabric Selection for Functional Clothing 3.2.1 Properties 3.2.2 Fibre Types 3.2.3 Blends 3.3 Specialized Functional Fabrics 3.3.1 Waterproof 3.3.2 Fire-resistant 3.3.3 UV-protective 3.3.4 Smart Textiles	10	22
4.	Design Considerations for Functional Clothing 4.1 Introduction to Functional Clothing Design 4.2 Concept and definition of functional clothing design 4.3 Design Considerations	10	22



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	4.3.1 Ergonomic considerations (fit, body measurements, comfort) 4.3.2 Safety requirements (protection from hazards) 4.3.3 Mobility and flexibility in design 4.3.4 Comfort factors (thermal, moisture, breathability) 4.3.5 Aesthetic aspects (appearance, colour, style) 4.3.6 Selection of appropriate materials and fabrics 4.3.7 Durability and maintenance requirements		
5.	Functional Clothing for Special Groups 5.1 Introduction to Special Groups 5.2 Importance of functional clothing for special groups 5.2.1 Clothing for Children 5.2.2 Clothing for Elderly People 5.2.3 Clothing for Differently-Abled Persons 5.2.4 Maternity Clothing 5.2.5 Vanity (Aesthetic) Assemblies in Functional Clothing 5.2.6 Cross-Functional Assemblies in Functional Clothing	10	22
	Total	45	100

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks (in %)					
R Level	U Level	A Level	N Level	E Level	C Level
20	40	20	20	-	-

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

1. Functional Clothing Design: From sportswear to spacesuits, Susan M. Watkins & Lucy E. Dunne, Bloomsbury Publication division, New Delhi. 2015 ISBN: 978.0-85785-467-4
2. Functional and Technical Textiles, Maity, S., Singha, K., & Pandit, P. (Eds.). (2023). Elsevier.
3. Textiles for Functional Applications, Kumar, B. (Ed.). (2019). Intech Open.
4. Functional Textiles and Clothing, Gupta, D., & Majumdar, A. (Eds.). (2025). Springer.
5. Functional Textiles for Improved Performance, Protection and Health, Pan, N., & Sun, G. (Eds.). (2011) Woodhead Publishing.

(b) Open-source software and website:

1. Functional Clothing: The Next A Buzzword in the Fashion Industry
2. What functional clothing actually is? [Article]
3. <https://www.youtube.com/watch?v=WlsTT2fFY9E>



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4. https://dl.ojocv.gov.et/admin_/book/Apparel%20manufacturing%20technology%20%28%20PDFDrive%20%29.pdf
5. https://www.researchgate.net/publication/296845630_Functional_clothing-Definition_and_classification

Suggested Course Practical List: If any

Sr. No.	Practical list	Hrs.
1	Draw any one Functional Clothing for children.	2
2	Draw any one Functional Clothing for elderly.	2
3	Draw any one Functional Clothing for Disabled person.	2
4	Draw any one Functional Clothing for protective wear.	2
5	Draw any one Functional Clothing for Sportswear.	2
6	Draw any one Functional Clothing for Medical wear.	2
7	Draw any one Functional Clothing for any Occupation.	2
8	Draw any one Functional Clothing for Vanity (Aesthetic) for female	2
9	Construct any one functional garment designed in practical no.1 to7	14
		30 Hrs.

List of Laboratory/Learning Resources Required:

Laboratory: Sewing lab

Suggested Project List:

1. **Collection & Identification:** Collect pictures of different functional garments and prepare scrap book.
2. **Chart making:** Prepare Chart/ tree for classification Functional clothing
3. **Report writing:** Prepare a report on origin of Functional clothing.
4. **Prepare Articles/accessories:** Prepare Articles/accessories using Functional theme.

Suggested Activities for Students: If any

- a. Assign internet-based assignments.
- b. Give seminar on any relevant topic.
- c. Assign teacher guided self-learning activities.
- d. Prepare assignment on different functional clothing.

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