

## GUJARAT TECHNOLOGICAL UNIVERSITY (GTU)

Competency-focused Outcome-based Green Curriculum-2022 (COGC-2022)  
Semester - IIICourse Title: Apparel Cutting Technology  
(Course Code: 4335103)

Diploma programmes in which this course is offered	Semester in which offered
Computer aided costume design and dress making	Third

**1. RATIONALE**

A clear need has been perceived for information on clothing manufacturing technology, related to current practice in the clothing industry. This course will provide guidance for garment manufacturing techniques for industry. It is essential to learn about marker planning, spreading of the fabric, cutting of the fabric and its objectives, methods of cutting, method of spreading etc. This course is useful for understanding garment manufacturing technology.

**2. COMPETENCY**

The purpose of this course is to help the student to attain the following industry identified competency through various teaching learning experiences:

- **Interpret marker planning, spreading and cutting of the fabric by various methods used in industry.**

**3. COURSE OUTCOMES (COs)**

The practical exercises, the underpinning knowledge and the relevant soft skills associated with the identified competency are to be developed in the student for the achievement of the following COs:

- Plan the pre-production activities in the garment industry.
- Apply different types of spreading methods.
- Select appropriate steps in cutting process of the garment for quality cutting.
- Interpret the post cutting process.

**4. TEACHING AND EXAMINATION SCHEME**

Teaching Scheme (In Hours)			Total Credits (L+T+P/2)	Examination Scheme				Total Marks
L	T	P		Theory Marks		Practical Marks		
			C	CA	ESE	CA	ESE	
3	-	-	3	30*	70	-	-	100

(\*): Out of 30 marks under the theory CA, 10 marks are for assessment of the micro-project to facilitate integration of COs and the remaining 20 marks is the average of 2 tests to be taken during the semester for assessing the attainment of the cognitive domain UOs required for the attainment of the COs.

**Legends:** L-Lecture; T – Tutorial/Teacher Guided Theory Practice; P - Practical; C – Credit, CA - Continuous Assessment; ESE - End Semester Examination.

**5. SUGGESTED PRACTICAL EXERCISES**

The following practical outcomes (PrOs) are the sub-components of the COs. *Some of the PrOs marked '\*\*' (in approx. Hrs column) are compulsory, as they are crucial for that particular CO at the 'Precision Level' of Dave's Taxonomy related to 'Psychomotor Domain'.*

Sr. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. required
1	Nil		

**Note**

- i. More **Practical Exercises** can be designed and offered by the respective course teacher to develop the industry relevant skills/outcomes to match the COs. The above table is only a suggestive list.
- ii. The following are some **sample** 'Process' and 'Product' related skills (more may be added/deleted depending on the course) that occur in the above listed **Practical Exercises** of this course which are embedded in the COs and ultimately the competency.

Sr. No.	Sample Performance Indicators for the PrOs	Weightage in %
1	Nil	

## 6. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED

This major equipment with broad specifications for the PrOs is a guide to procure them by the administrators to usher in uniformity of practical in all institutions across the state.

Sr. No.	Equipment Name with Broad Specifications	PrO. No.
1	Nil	

## 7. AFFECTIVE DOMAIN OUTCOMES

The following **sample** Affective Domain Outcomes (ADOs) are embedded in many of the above mentioned COs and PrOs. More could be added to fulfil the development of this course t competency.

- a) Work as a leader/a team member.
- b) Realize importance of fabric cutting waste.

The ADOs are best developed through the laboratory/field based exercises. Moreover, the level of achievement of the ADOs according to Krathwohl's 'Affective Domain Taxonomy' should gradually increase as planned below:

- i. 'Valuing Level' in 1<sup>st</sup> year
- ii. 'Organization Level' in 2<sup>nd</sup> year.
- iii. 'Characterization Level' in 3<sup>rd</sup> year.

## 8. UNDERPINNING THEORY

The major underpinning theory is given below based on the higher level UOs of *Revised Bloom's taxonomy* that are formulated for development of the COs and competency. If required, more such higher level UOs could be included by the course teacher to focus on attainment of COs and competency.

Unit	Unit Outcomes (UOs)	Topics and Sub-topics
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	(4 to 6 UOs at different levels)	
<b>Unit – I</b> Pre-Production activities	1a. Select pre-production activities as per the requirement 1b. Prepare the fabric reconciliation report	1.1 List all the activities sequentially before production. 1.1.1. Initial Samples development and approvals 1.1.2. Fabric development 1.1.3. Development of print and embroidery swatches for approval. 1.1.4. Pattern making and grading 1.1.5. Fit sample development. 1.1.6. Size set sample development 1.1.7. Pre production sample development 1.1.8. Sourcing and testing raw materials, 1.1.9. Pre production meeting 1.1.10. Costing of a garment 1.1.11. Preparation of production schedule. 1.2 Fabric reconciliation report
<b>Unit – II</b> Marker planning	2a. Define Marker planning. 2b. Manipulate marker planning of different garments on different varieties of fabric. 2c. Use appropriate methods of marker planning. 2d. Plan fabric cutting for cost effective production of garment.	2.1 Marker and its meaning. 2.2 The planning, drawing and reproduction of the marker. 2.2.1 The requirements of marker planning. 2.2.2 Methods of marker planning. 2.2.2.1 Manual marker planning 2.2.2.2 Computerized marker planning 2.2.3 Marker efficiency calculation 2.3 Cut order planning
<b>Unit – III</b> Spreading of the fabric	3a. Explain Spreading process. 3b. Explain different effect of fabric parameters on spreading & cutting. 3c. Differentiate the nature of fabric packages.	3.1 The requirements of spreading process. 3.2 Methods of spreading. 3.2.1 Spreading by hand. 3.2.2 Spreading using a traveling machine. 3.3 Effect of width variation on spreading & cutting 3.4 Effect of fabric shrinkage on spreading & cutting 3.5 The nature of fabric packages. 3.5.1 Open fabric – rolled. 3.5.2 Tubular knitted fabric – rolled. 3.5.3 Folded fabric – rolled. 3.5.4 Folded fabric – cutted. 3.5.5 Velvet hanging

<b>Unit– IV</b> Cutting of the fabric	4a. Explain objectives of Cutting. 4b. Use appropriate Cutting tools and Equipments.	4.1 The objectives of Cutting. 4.2 Cutting tools and Equipments. 4.2.1 Hand Shears. 4.2.2 Straight Knife. 4.2.3 Band Knife. 4.2.4 Round Knife. 4.2.5 Notchers. 4.2.6 Drills & thread markers. 4.2.7 Computer Controlled Cutting knives. 4.2.8 Die Cutting 4.2.9 Laser Cutting. 4.2.9 Plasma Cutting. 4.2.10 Water Jet Cutting 4.2.11 Ultrasonic Cutting.
<b>Unit– V</b> Post cutting process.	5a. Explain Importance of Post cutting process. 5b. Explain fabric cutting waste Management.	5.1 Importance of Post cutting process. 5.2 Post cutting process. 5.2.1 Fusing the garment parts 5.2.2 Sorting, Ticketing and Bundling 5.3 Importance and management of fabric cutting waste.

## 9. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Pre-production activities	4	3	2	1	06
II	Marker planning	12	6	10	4	20
III	Spreading of the fabric	10	7	7	4	18
IV	Cutting of the fabric	10	6	8	6	20
V	Post cutting process.	6	2	2	2	06
<b>Total</b>		<b>42</b>	<b>24</b>	<b>29</b>	<b>17</b>	<b>70</b>

**Legends:** R=Remember, U=Understand, A=Apply and above (Revised Bloom's taxonomy)

**Note:** This specification table provides general guidelines to assist student for their learning and to teachers to teach and question paper designers/setters to formulate test items/questions to assess the attainment of the UOs. The actual distribution of marks at different taxonomy levels (of R, U and A) in the question paper may vary slightly from above table.

## 10. SUGGESTED STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related **co-curricular** activities which can be undertaken to accelerate the attainment of the various outcomes in this course. Students should conduct following activities in group and prepare reports of about 5 pages for each activity. They also collect/record physical evidences for their (student's) portfolio which will be useful for their placement interviews:

- a) Students will visit to nearest garment industry.
- b) Critically observe the marker making, spreading and various steps involved in cutting process.
- c) Make assignment on Marker planning and drawing of different types of spreads.

#### **11. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)**

These are sample strategies, which the teacher can use to accelerate the attainment of the various outcomes in this course:

- a) Massive open online courses (**MOOCs**) may be used to teach various topics/sub topics.
- b) Guide student(s) in undertaking micro-projects.
- c) '**L**' in **section No. 4** means different types of teaching methods that are to be employed by teachers to develop the outcomes.
- d) About **20% of the topics/sub-topics** which are relatively simpler or descriptive in nature is to be given to the students for **self-learning**, but to be assessed using different assessment methods.
- e) With respect to **section No.10**, teachers need to ensure to create opportunities and provisions for **co-curricular activities**.
- f) Guide students on how to address issues on environment and sustainability.
- g) Show video films of different cutting processes used in garment industry.

#### **12. SUGGESTED MICRO-PROJECTS**

**Only one micro-project** is planned to be undertaken by a student that needs to be assigned to him/her in the beginning of the semester. In the first four semesters, the micro-project are group-based (group of 3 to 5). However, **in the fifth and sixth semesters**, the number of students in the group should **not exceed three**.

The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. Each micro-project should encompass two or more COs which are in fact, an integration of PrOs, UOs and ADOs. Each student will have to maintain dated work diary consisting of individual contribution in the project work and give a seminar presentation of it before submission. The duration of the microproject should be about **14-16 (fourteen to sixteen) student engagement hours** during the course. The students ought to submit micro-project by the end of the semester to develop the industry-oriented COs.

A suggestive list of micro-projects is given here. This has to match the competency and the COs. Similar micro-projects could be added by the concerned course teacher:

- a) **Cutting machine:** Collect pictures of different types of cutting machines and prepare report/chart on it.
- b) **Cut order plan:** Prepare two or three cut order plan.
- c) **Marker plan:** Prepare marker plan for shirt size 42" for the given fabric width (36" and 45") and analyze the use and cost of the fabric.
- d) **Fabric waste management:** Prepare a report on fabric waste management in the garment unit.

### 13. SUGGESTED LEARNING RESOURCES

S. No.	Title of Book	Author	Publication with place, year and ISBN
1	Technology of clothing Manufacturers	Harold Carr & Barbera Latham	Blackwell Science
2	Apparel Manufacturing Analysis	Jacob Solinger	Bobbin Media Corporation, 1988
3	Managing Quality in Apparel Industry	Mehta &Bharadwaj	New Age Publisher, Delhi
4	Handbook of Quality	Joseph Juran	Mc Graw Hill ISBN ISBN 978-0-07-0162973-7
5	Garment Manufacturing: Processes, Practices and Technology	Prasanta Sarkar	Power publishers ISBN: 9789383701759

### 14. SOFTWARE/LEARNING WEBSITES

- <https://www.youtube.com/watch?v=-drZfpU8jLg>
- <https://www.youtube.com/watch?v=nmkS8brdWhl>
- <https://www.youtube.com/watch?v=wJK5XgYefBQ>
- <https://www.youtube.com/watch?v=B7H5kiEIOsU>
- <https://www.youtube.com/watch?v=palmFFnMT1E>
- <https://www.youtube.com/watch?v=AxHt1Hvo1fc>
- <https://youtu.be/8p7qwW4iyOM>

### 15. PO-COMPETENCY-CO MAPPING

Semester III	Apparel Cutting Technology (Course Code: 4335103 )						
	POs						
Competency & Course Outcomes	PO 1 Basic & Discipline specific knowledge	PO 2 Problem Analysis	PO 3 Design/ development of solutions	PO 4 Engineering Tools, Experimentation &Testing	PO 5 Engineering practices for society, sustainability & environment	PO 6 Project Management	PO 7 Life-long learning
<u>Competency</u>	Interpret marker planning, spreading and cutting of the fabric by various methods used in industry.						
<u>Course Outcomes</u> CO a) Plan the pre-production activities in the garment industry.	3	2	2	-	2	2	3
CO b) Apply different types of spreading	3	2	2	-	2	2	3

methods.							
CO c) Select appropriate steps in cutting process of the garment for quality cutting.	3	2	2	-	2	2	3
CO d) Interpret the post cutting process.	3	2	2	-	2	2	3

Legend: '3' for high, '2' for medium, '1' for low and '-' for no correlation of each CO with PO.

## 16. COURSE CURRICULUM DEVELOPMENT COMMITTEE

### GTU Resource Persons

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