

## GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

### Course Curriculum

### GARMENT MACHINERY

(Code: 3335101)

Diploma Programmes in which this course is offered	Semester in which offered
Computer Aided Costume Design and Dress Making	3 <sup>rd</sup> Semester

#### 1. RATIONALE

This course will provide proficiency in understanding of various types of machines used in garment manufacturing industry right from cutting to final packing. Thus this course is very important for students who wants to work in the garment manufacturing industry. Knowledge of this course is required by garment designers also because garments should be designed in such a way that it is possible to manufacture them economically.

#### 2. COMPETENCY (Programme Outcome according to NBA Terminology)

The course content should be taught and with the aim to develop different types of skills so that students are able to acquire following competency:

- **Plan and Supervise operations on sewing, cutting and finishing machine as per requirement of garments to be manufactured.**

#### 3. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				Total Marks
L	T	P		Theory Marks		Practical Marks		
L	T	P	C	ESE	PA	ESE	PA	150
4	0	2	6	70	30	20	30	

**Legends:** L-Lecture; T – Tutorial; P -Practical; C – Credit; ESE -End Semester Examination; PA - Progressive Assessment.

#### 4. DETAILED COURSE CONTENT

Unit	Major Learning Outcomes (Course Outcomes as per NBA terminology)	Topics and Sub-topics
<b>Unit –I History of Sewing Machines</b>	1a. Differentiate between domestic and industrial sewing machine 1b. Explain functioning of sewing machines.	<b>Different parts of sewing machine and its function:</b> 1.1 Thread Stand Feed Dock 1.2 Pressure Foot, Throat plate 1.3 Take up lever, Tension spring 1.4 Needle bar 1.5 Bobbin, Bobbin case, 1.6 Thread take up lever, 1.7 Stitch regulator, 1.8 Back tack lever etc.
<b>Unit– II Classification of Sewing Machines</b>	2a. Classify the sewing machine based on stitch type. 2b. Classify the sewing machine based on type of machine bed 2c. Classify the sewing machine based on feeding system. 2d. Classify the sewing machine based on lubrication system. 2e. Classify the sewing machine based on type of motor. 2f. Classify the sewing machine based on stitch type. 2g. Classify the sewing machine based on Fabric weight.	<b>2.1 Stitch type as per Federal Stitch Standard</b> <ul style="list-style-type: none"> <li>• Loop formation method interloping, interloping and interlacing.</li> <li>• Single Thread</li> <li>• Chain Stitch</li> <li>• Lock Stitch</li> <li>• Multithread Chain Stitch</li> <li>• Cover Stitch (Over lock)</li> <li>• Flat Lock Stitch</li> </ul> <b>2.2 Machine Bed</b> <ul style="list-style-type: none"> <li>• Flat Bed</li> <li>• Raised Bed</li> <li>• Circular Cylindrical Bed</li> <li>• Axial Cylindrical Bed</li> <li>• Post Bed</li> </ul> <b>2.3 Feeding System</b> <ul style="list-style-type: none"> <li>• Drop Feed</li> <li>• Differential Feed</li> <li>• Top Variable Bottom Feed</li> <li>• Needle Feed</li> <li>• Unison Feed</li> <li>• Cam Feed</li> <li>• Belt Feed</li> <li>• Roller Feed</li> </ul> <b>2.4 Lubrication system</b> <ul style="list-style-type: none"> <li>• Manual Lubrication</li> <li>• Automatic Lubrication through</li> </ul>

Unit	Major Learning Outcomes (Course Outcomes as per NBA terminology)	Topics and Sub-topics
		Pump <ul style="list-style-type: none"> <li>• Semi Dry Head</li> <li>• Dry Head</li> <li>• Minimum Lubrication</li> </ul> <b>2.5 Machine Motor type</b> <ul style="list-style-type: none"> <li>• Clutch Motor</li> <li>• Servo Motor</li> <li>• Direct Drive Motor</li> </ul> <b>2.6 Fabric Weight:</b> <ul style="list-style-type: none"> <li>• Light Weight Fabric</li> <li>• Medium Weight Fabric</li> <li>• Heavy Weight Fabric</li> </ul>
<b>Unit- III</b> <b>Types of sewing needles</b>	3a. Describe different types of Sewing Needles	3.1 <b>Basic part of the sewing needles,</b> nomenclature and their functions and different types of points and their application
<b>Unit – IV</b> <b>Sewing Threads</b>	4a. Identify sewing threads based on given criteria.	4.1 Different materials used for sewing thread 4.2 Ticket number 4.3 Thread size 4.4 Correlation 4.5 Application of the threads
<b>Unit-V</b> <b>Types of Sewing Machines</b>	5a Explain working principles of sewing machines. 5b Operate threading and basic setting of the sewing machines 5c Describe advance types of sewing machines.	5.1 Single Needle Lock Stitch Machine with Control Panel 5.2 Double Needle Lock Stitch Machine 5.3 Multi Needle Chain Stitch Machine with Puller and Elastic Tension Adjustment 5.4 Over Lock Machine (4 thread and 5 thread) 5.5 Blind Stitch Machine 5.6 Three needle Flat Lock Machine 5.7 Double Needle Feed off the Arm Machine 5.8 Computerized Embroidery Machine 5.9 Computerized Bar Take Machine 5.10 Computerized Button Hole Machine 5.11 Computerized Eyelet Machine 5.12 Computerized Button Attaching Machine

<b>Unit</b>	<b>Major Learning Outcomes</b> (Course Outcomes as per NBA terminology)	<b>Topics and Sub-topics</b>
<b>Unit-VI Cutting Room Equipment</b>	6a Describe different type of cutting equipments	6.1 Straight Knife Cutter 6.2 Round Knife Cutter 6.3 Notcher 6.4 Drill Machine 6.5 Die Cutter 6.6 Bend Knife Machine
<b>Unit-VII Computerized Cutting Room Equipment</b>	7a Describe different types of computerized cutting room equipments	7.1 Automatic Cutter – single ply and multiply 7.2 Automatic Spreader 7.3 Laser Cutter 7.4 Ultrasonic Cutter 7.5 Water jet Cutter 7.6 Steam press with steam table and boiler (different types of bugs, Non Return Valve, steam trapper, cladding, steam line etc.)
<b>Unit-VIII Finishing Equipment</b>	8a Explain functions and features of different finishing equipment.	8.1 Basic understanding of the following finishing room equipments: 8.2 Foam finisher 8.3 Tunnel finisher 8.4 Steam Dolly 8.5 Carousel press 8.6 Topper & leggers
<b>Unit-IX Devices</b>	9a Describe De Skilling & Labour Saving Devices	9.1 Various types of attachments, folders, guides, pressure feet etc.
<b>Unit-X Advance Machines</b>	10a Familiarize with Advance garment Machines	10.1 Different Advance Machines

## 5. SUGGESTED SPECIFICATION TABLE WITH HOURS& MARKS (Theory)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total
I	History of Machines	2	2	2	0	4
II	Classification of Sewing Machines	10	2	4	2	8
III	Types of Sewing Needles	2	2	2	2	6
IV	Types of Sewing Threads	2	2	2	2	6
V	Types of Sewing Machines	14	2	6	2	10
VI	Cutting Room Equipment	7	3	4	2	9
VII	Computerized Cutting Room Equipment	8	2	4	2	8
VIII	Finishing Equipment	5	3	2	2	7
IX	Devices	4	2	2	2	6
X	Advance Machines	2	2	2	2	6
	<b>Total</b>	<b>56</b>	<b>22</b>	<b>30</b>	<b>18</b>	<b>70</b>

**Legends:** R = Remember; U = Understand; A = Apply and above levels (Bloom's revise taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6. SUGGESTED LIST OF PRACTICAL/EXERCISES

The practical/exercises should be properly designed and implemented with an attempt to develop different types of practical skills (**Course Outcomes in psychomotor and affective domain**) so that students are able to acquire the competencies (Programme Outcomes). Following is the list of practical exercises for guidance.

**Note:** Here only Course Outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

<b>S. No.</b>	<b>Unit No.</b>	<b>Practical/Exercise</b> (Course Outcomes in Psychomotor Domain according to NBA Terminology)	<b>Approx. Hours Required</b>
1	II	Develop sample by using different feeding system.	06
2	V	Develop sample by using following machines: 1. Single Needle Lock Stitch Machine with Control Panel 2. Double Needle Lock Stitch Machine 3. Multi Needle Chain Stitch Machine with Puller and Elastic adjustment 4. Over Lock Machine (4 thread & 5 thread) 5. Blind Stitch Machine 3 Needle Flat Lock Machine 6. Double Needle Feed Off the Arm Machine 7. Computerized Embroidery Machine 8. Computerized Bar Take Machine 9. Computerized Button Hole Machine 10. Computerized Eylet Machine 11. Computerized Button Attaching Machine	11x2 = 22
<b>Total</b>			<b>28</b>

## 7. SUGGESTED LIST OF STUDENT ACTIVITIES

- i. Students will develop the file of samples for different types of Feeding System
- ii. Students will record the specification of each machine with the details like needle type, feeding system, throat plate, type of stitch, lubrication system, machine bed type, threading square, special features, machine catalog, name of the company etc.
- iii. Student will collect photographs from internet which is related to field application of various topics as an assignment.

## 8. SPECIAL INSTRUCTIONAL STRATEGIES (If Any)

- i. Arrange visit to nearby garment manufacturing unit.
- ii. Show video/animation films on functioning of different types of machines.

## 9. SUGGESTED LEARNING RESOURCES

**A. List of Books**

<b>Sr. No.</b>	<b>Title of Book</b>	<b>Author</b>
<b>1.</b>	Technology of clothing Manufacturers	Arnold Carr & Barber Lotham
<b>2.</b>	Apparel Manufacturing Analysis	Jacob Solinger

**B. List of Major Equipment/ Instrument**

- i. Basic Single Needle Drop Feed Medium Weight Flat Bed Lock Stitch Machine
- ii. Computerized Single Needle Lock Stitch Machine
- iii. Double Needle Lock Stitch Machine
- iv. Multi Needle Chain Stitch Machine with Puller and Elastic adjustment
- v. Over Lock Machine (4 thread & 5 thread)
- vi. Blind Stitch Machine
- vii. Needle Flat Lock Machine
- viii. Double Needle Feed Off the Arm Machine
- ix. Computerized Embroidery Machine
- x. Computerized Bar Take Machine
- xi. Computerized Button Hole Machine
- xii. Computerized Eylet Machine
- xiii. Computerized Button Attaching Machine
- xiv. Straight Knife Cutter
- xv. Round Knife Cutter
- xvi. Hot Notcher
- xvii. Hot Drill Machine
- xviii. Die Cutter
- xix. Bend Knife Machine
- xx. Ply Cutter
- xxi. Laser Cutter
- xxii. Foam Finisher

- xxiii. Fusing Machines
- xxiv. Steam Press with Steam Table and Boiler

### **C. List of Software/Learning Websites**

- i. [www.just-style.com](http://www.just-style.com)
- ii. [www.techexchange.com](http://www.techexchange.com)
- iii. Website of machine manufactures

## **10. COURSE CURRICULUM DEVELOPMENT COMMITTEE**

### **Faculty Members from Polytechnics**

- **Prof. (Ms.) I. J. Dave**, HOD CADDM, Sir Bhavsinhji Polytechnic Institute, Bhavnagar
- **Prof. (Ms.) Neerja Atrey**, Lecturer CACDDM, Govt. Polytechnic for Girls, Ahmedabad
- **Prof. (Ms.) K. P. Shah**, I/C HOD CADDM, C U Shah Polytechnic, Surendranagar
- **Prof. (Ms.) R. O. Yadav**, Lecturer CADDM C U Shah Polytechnic, Surendranagar

### **Faculty Members from NIFT Gandhinagar.**

- **Prof. Pavan Godiawala**, Director and Professor, Fashion Technology
- **Prof. Nupur Chpora**, Assistant Professor, Fashion Technology

### **Coordinator and Faculty Members from NITTTR Bhopal**

- **Prof. (Mrs.) Chanchal Mehra**, Associate Professor, Department of Vocational Education and Entrepreneurship Development
- **Dr Shashi Kant Gupta**, Professor and Coordinator for State of Gujarat.