



**Maharashtra State Board of Technical Education, Mumbai**  
**Teaching and Examination Scheme for Post S.S.C. Diploma Courses**

**Program Name : Diploma in Fashion & Cloting Technology**

**Program Code : DC**

**Duration of Program : 6 Semesters**

**With Effect From Academic Year: 2017 - 18**

**Semester : Second**

**Duration : 16 Weeks**

S. N.	Course Title	Course Abbreviation	Course Code	Teaching Scheme			Credit (L+T+P)	Examination Scheme													Grand Total
				L	T	P		Theory						Practical							
								ESE		PA		Total		ESE		PA		Total			
								Max Marks	Min Marks	Max Marks	Min Marks	Max Marks	Min Marks	Max Marks	Min Marks	Max Marks	Min Marks	Max Marks	Min Marks		
1	Basics of Textile Manufacture	BTM	22234	3	-	2	5	3	70	28	30*	00	100	40	25@	10	25	10	50	20	150
2	Basics of Fashion & Apparel	BFA	22235	3	-	-	3	3	70	28	30*	00	100	40	--	--	--	--	--	--	100
3	Principles of Textile & Fashion Design	PFT	22236	4	-	4	8	3	70	28	30*	00	100	40	50#	20	50	20	100	40	200
4	Pattern Making	PMA	22237	2	-	4	6	3	70	28	30*	00	100	40	50#	20	50	20	100	40	200
5	Elements of Mechanical, Electrical & Electronics Engineering	EOM	22238	3	-	2	5	3	70	28	30*	00	100	40	25@	10	25	10	50	20	150
6	Business Communication Using Computers	BCC	22009	-	-	2	2	--	--	--	--	--	--	--	35@^	14	15~	06	50	20	50
7	Elements of Embroidery	EOE	22015	-	-	2	2	--	--	--	--	--	--	--	25@	10	25~	10	50	20	50
8	Fundamentals of Fashion Illustrations	FFI	22016	-	-	4	4	--	--	--	--	--	--	--	50@	20	50~	20	100	40	100
<b>Total</b>				<b>15</b>	<b>-</b>	<b>20</b>	<b>35</b>	<b>--</b>	<b>350</b>	<b>--</b>	<b>150</b>	<b>--</b>	<b>500</b>	<b>--</b>	<b>260</b>	<b>--</b>	<b>240</b>	<b>--</b>	<b>500</b>	<b>--</b>	<b>1000</b>

Student Contact Hours Per Week: **35 Hrs.**

Medium of Instruction: **English**

**Theory and practical periods of 60 minutes each.**

Total Marks : **1000**

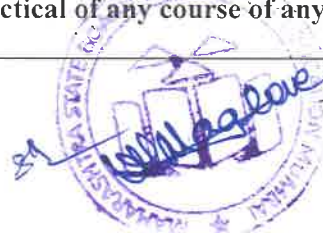
Abbreviations: ESE- End Semester Exam, PA- Progressive Assessment, L - Lectures, T - Tutorial, P - Practical

@ Internal Assessment, # External Assessment, \*# On Line Examination, ^ Computer Based Assessment

\* Under the theory PA, Out of 30 marks, 10 marks are for micro-project assessment (5 marks each for Physics and Chemistry) to facilitate integration of COs and the remaining 20 marks is the average of 2 tests to be taken during the semester for the assessment of the cognitive domain LOs required for the attainment of the COs.

~ For the courses having ONLY Practical Examination, the PA marks Practical Part - with 60% weightage and Micro-Project Part with 40% weightage

➤ **If Candidate not securing minimum marks for passing in the "PA" part of practical of any course of any semester then the candidate shall be declared as "Detained" for that semester.**





S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. required
9	Use fabric sample to determine the end per inch and picks per inch.	IV	02
10	Use winding machine to convert smaller package to bigger package.	IV	02
11	Use warping machine to prepare raw material for next process.	V	02
12	Use warping machine to determine the creel capacity and determine beam specification.	V	02
13	Use power looms to correlate the principles of fabric manufacturing. (Part -I)	IV,V	02
14	Use power looms to correlate the principles of fabric manufacturing. (Part -II)	IV,V	02
15	Use multi-colored warp and weft fabric to calculate crimp percentage, warp and weft count, cover factor.	VI	02
16	Determine warp and weft color repeat	VI	02
<b>Total</b>			<b>32</b>

**Note**

i. A suggestive list of PrOs is given in the above table. More such PrOs can be added to attain the COs and competency. A judicious mix of minimum 12 or more practical need to be performed, out of which, the practicals marked as '\*' are compulsory, so that the student reaches the 'Precision Level' of Dave's 'Psychomotor Domain Taxonomy' as generally required by the industry.

ii. The 'Process' and 'Product' related skills associated with each PrO is to be assessed according to a suggested sample given below:

S. No.	Performance Indicators	Weightage in %
1	Preparation of experimental set up	20
2	Setting and operation	20
3	Safety measures	10
4	Observations and Recording	10
5	Interpretation of result and conclusion	20
6	Answer to sample questions	10
7	Submission of report in time	10
<b>Total</b>		<b>100</b>

The above PrOs also comprise of the following social skills/attitudes which are Affective Domain Outcomes (ADOs) that are best developed through the laboratory/field based experiences:

- Follow safety practices.
- Practice good housekeeping.
- Demonstrate working as a leader/a team member.
- Maintain tools and equipment.
- Follow ethical practices.

The ADOs are not specific to any one PrO, but are embedded in many PrOs. Hence, the acquisition of the ADOs takes place gradually in the student when s/he undertakes a series of practical experiences over a period of time. Moreover, the level of achievement of the ADOs according to Krathwohl's 'Affective Domain Taxonomy' should gradually increase as planned below:



- 'Valuing Level' in 1<sup>st</sup> year
- 'Organising Level' in 2<sup>nd</sup> year and
- 'Characterising Level' in 3<sup>rd</sup> year.

**6. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED**

The major equipment with broad specification mentioned here will usher in uniformity in conduct of experiments, as well as aid to procure equipment by authorities concerned.

S. No.	Equipment Name with Broad Specifications	Exp. No.
1	Ten different fabrics with different ends and picks per inch.	1,6
2	Counting glass, needle, steel ruler	2
3	Winding machine	2
4	Warping machine	3
5	Power looms	4
6	Wrap reel and weighing balance	5
7	Blow room machine	7
8	Carding and combing machine	8
9	Draw frame, fly frame and ring frame machine	9,10

**8. UNDERPINNING THEORY COMPONENTS**

The following topics/subtopics are to be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency.

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>Spinning</b>		
<b>Unit – I Pre-opening</b>	1a. Explain cultivation process for the given textile fiber. 1b. Describe the objects of pre-opening for the given fiber. 1c. Classify the given textile fibers. 1d. Sketch the process flow chart for the specified type of yarn.	1.1 Cotton fiber cultivation and picking 1.2 Pre cleaning: objects of pre ginning and ginning, Dimensions of bale, Objects of pressing. 1.3 Textile fiber: definition, Essential properties and classification. 1.4 Flow chart for carded, combed and double yarn.
<b>Unit– II Yarn Spinning</b>	2a. Explain the specified purpose of blow room and carding. 2b. Explain the specified objects of comber and speed frame. 2c. Distinguish the features of the given types of yarns. 2d. Describe the effects of given yarn parameters for the spinning process.	2.1 Purpose of blow room, carding; draw frame, sliver lap and ribbon lap, comber, speed frame, ring frame 2.2 Classification of Yarn: single yarn, double yarn, staple yarn, hosiery yarn, open end yarn, ring yarn, air jet yarn, dref yarn. 2.3 Yarn parameter: Strength, Elongation, maturity, yarn count, hairiness, evenness.
<b>Unit– III Yarn</b>	3a. Explain the specified yarn numbering system.	3.1 Yarn numbering system 3.2 Indirect numbering system-Number

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>Numbering system</b>	3b. Differentiate between the given type of yarn numbering systems.	English , Metric, woolen, worsted, linen, French
	3c. Determine the yarn count for the given yarn.	3.3 Simple Calculations based on different yarn numbering system.
	3d. Calculate the yarn size of the given type of yarn by using yarn numbering system.	3.4 Resultant yarn count and related calculation. 3.5 Yarn specification-Linear density 3.6 Practical difficulties in measuring the yarn diameter. 3.7 Count, Tex, Denier
	<b>Weaving</b>	
<b>Unit-IV Preparatory Elements of Weaving</b>	4a. Describe the specified objects related to weaving.	4.1 Fabric: warp, weft, objects: Winding, warping, sizing, drawing-in, cone dyeing, beam dyeing, pirn winding, weaving
	4b. Differentiate between the given two types of process flow charts.	4.2 Process flow charts ; A) Grey fabric b) Mono color fabric (dyed warp and gray weft), c) Warp or weft stripes d) pattern, e) warp and weft both colored
	4c. Classify the given types of looms with respect to different parameters.	4.3 Classification of looms.
	4d. Select the method to produce the given type of fabric.	4.4 Methods to produce fabric; weaving, knitting, braiding, felting, non-woven.
<b>Unit –V Principles of Weaving</b>	5a. Identify the requirement of cone specification for cone dyeing for the given situation.	5.1 Types of winding, Winding package; cone, cheese, its specification, requirement of package for cone dyeing, types of cones available to wind packages for dyeing
	5b. Predict the effect of creel capacity on warping in the specified machine.	5.2 Classimat chart,
	5c. Identify the quality requirement of warping beam for the specified process.	5.3 Warping: Objects, passage of warp through the machine, types of warping, creel capacity and its effect, Quality requirement of warping beam, beam defects, requirement of package for beam dyeing.
	5d. Identify the requirement of sizing for the given beam.	5.4 Sizing: Importance, passage of warp, stretch, size pick up and size add-on, specification of sized beam.
	5e. Describe the given operation of the weaving section.	5.5 Drawing-in: objects, draft, drawing in order, reed
	5f. Explain the function of the specified objects of drawing-in process.	5.6 Element of fabric; EPI, PPI, cover factor, GSM, crimp percentage, interlacement, selvage type
	5g. Explain with sketches the functions of the given elements of fabric.	5.7 Shedding; objects, plain, dobby, jacquard. Picking; shuttle, projectile, rapier, air jet. Beatup: objective, Take up and Letoff.
	5h. Describe the given type of Shedding with sketch.	5.8 Fabric inspection; Defects , grading
	5i. Describe with sketch the given type of fabric defects.	

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
		system, cut looking.

*Note: To attain the COs and competency, above listed UOs need to be undertaken to achieve the 'Application Level' of Bloom's 'Cognitive Domain Taxonomy'.*

## 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-opening	04	02	02	04	08
II	Yarn Spinning	10	04	04	06	14
III	Yarn Numbering System	10	04	02	06	12
IV	Preparatory and Elements of Weaving	10	04	04	06	14
V	Principle of Weaving	14	04	06	12	22
<b>Total</b>		<b>48</b>	<b>18</b>	<b>18</b>	<b>34</b>	<b>70</b>

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

*Note: This specification table provides general guidelines to assist student for their learning and to teachers to teach and assess students with respect to attainment of of UOs.. The actual distribution of marks at different taxonomy levels (of R, U and A) in the question paper may vary 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:

- Measure yarn number by direct and indirect systems.
- Present seminar on any relevant topic.
- Library survey regarding modern spinning and weaving.
- Prepare power point presentation for showing different types of yarn, fabric, method to produce the fabric.
- Undertake a market survey of different qualities of woven fabric.
- Massive Open Online Courses (MOOCs) may be used to teach various topics / subtopics

## 11. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES

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

- Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.
- 'L' in item No. 4 does not mean only the traditional lecture method, but different types of teaching methods and media that are to be employed to develop the outcomes.
- About *15-20% of the topics/sub-topics* which is relatively simpler or descriptive in nature is to be given to the students for *self-directed learning* and assess the development of the COs through classroom presentations (see implementation guideline for details).
- With respect to item No.10, teachers need to ensure to create opportunities and provisions for *co-curricular activities*.
- Guide student(s) in undertaking micro-projects.



## 12. SUGGESTED MICRO-PROJECTS

*Only one micro-project* is planned to be undertaken by a student assigned to him/her in the beginning of the semester. S/he ought to submit it by the end of the semester to develop the industry oriented COs. Each micro-project should encompass two or more COs which are in fact, an integration of PrOs, UOs and ADOs. The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. 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 total duration of the micro-project should not be less than **16 (sixteen) student engagement hours** during the course.

In the first four semesters, the *micro-project* could be group-based. However, in higher semesters, it should be individually *undertaken* to build up the skill and *confidence* in every student to become problem solver so that s/he contributes to the projects of the industry. A suggestive list to be given to groups of 3 to 4 students is given here. Similar *micro-projects* could be added by the concerned faculty:

- Pre opening:** Each group of 3 to 4 students will collect pictures of various stages of cultivation and preopening process and prepare booklet by labeling objective of each process.
- Yarn spinning:** Each batch will collect different type of yarn sample and prepare booklet by giving information related to collected sample.
- Yarn spinning:** Each batch will collect photographs of each machine required for yarn manufacturing and prepare flash presentation by listing objective of each process.
- Yarn numbering system:** Each batch will collect different sizes of yarns and prepare black card sheet by labeling their yarn numbers in tex and Ne.
- Principle of weaving:** Each batch will prepare flow chart diagrams for various process required for producing fabric and study objectives of various loom motions.
- Principle of weaving:** Each batch will prepare specification table of requirements of package dimensions and parameters required for cone, beam dyeing.

## 13. SUGGESTED LEARNING RESOURCES

S. No.	Title of Book	Author	Publication
1.	The Technology of short staple spinning	Klein, Werner	The Textile Institute ISBN : 1 87081298 8
2.	Spinning	Lord, P.R	Woodhead Publications ISBN :1 85573 9771
3.	Spinning of Manmades and Blends on cotton spinning	Salotra, K.R	The Textile Association Of India, ISBN :81 89328 00 X
4.	Spun Yarn Technology	Oxberg, Eric	Butterworths (Publishers) Limited, 1983, ISBN :0-408014644
5.	Weaving Conversion of Yarns to Fabric	Lord, P.R	Woodhead Publication ISBN :1 855734834
6.	Principle Of Weaving	Marks, & Robbinson	The Textile Institute, ISBN :0-900739797
7.	Weaving: Machines, Mechanisms, Management	Talukdar, M.K, Ajgaonkar, D.B, Sr.ramulu ,P.K	Mahajan Publisher Private Limited, ISBN :81-85401-16-0

S. No.	Title of Book	Author	Publication
8.	Modern Preparation and Weaving Technology	Ormerod, A.	Butterworth, (Publishers) Limited, 1983, 0408012129, 9780408012126
9.	Elements of Raw Cotton and Blow Room	Khare, A.R	Sai Book Center
10.	Cotton Spinning Calculation	Pattabhiraman, T.K	Mahajan Publisher Private Limited

## 14. SOFTWARE/LEARNING WEBSITES

- [www.textileword.com](http://www.textileword.com)
- [www.textileinfo.com](http://www.textileinfo.com)
- <http://www.textileschool.com/articles/109/blow-room-functions>
- [http://textilelearner.blogspot.in/2011/07/basic-operations-in-blowroom\\_485.html](http://textilelearner.blogspot.in/2011/07/basic-operations-in-blowroom_485.html)
- [http://textilelearner.blogspot.in/2011/03/blowroom-objects-of-blow-room-basic\\_2485.html](http://textilelearner.blogspot.in/2011/03/blowroom-objects-of-blow-room-basic_2485.html)
- <http://www.rieter.com/cz/rikipedia/articles/rotor-spinning/applications-engineering/preparation-of-raw-material/the-processing-stages/blowroom/>
- <https://www.youtube.com/watch?v=IDGmXss7a6s>
- [https://en.wikipedia.org/wiki/Cotton\\_gin](https://en.wikipedia.org/wiki/Cotton_gin)
- <https://s-media-cache-ak0.pinimg.com/564x/b8/76/b6/b876b60703a1b40138e5b800dd7212e2.jpg>
- <http://gluedideas.com/Encyclopedia-Britannica-Volume-6-Part-2-Colebrooke-Damascius/Cotton-Ginning-Machinery.html>
- [http://textilelearner.blogspot.in/2011/08/what-is-ginning-cotton-ginning-types-of\\_8829.html](http://textilelearner.blogspot.in/2011/08/what-is-ginning-cotton-ginning-types-of_8829.html)
- <http://textilefashionstudy.com/what-is-textile-fiber-classifications-of-textile-fiber/>
- <http://cms.geg11.ac.in/attachments/article/87/CLASSIFICATION%20OF%20YARN.pdf>
- <http://www.textbooksonline.tn.nic.in/books/11/stdxi-voc-textiles-em.pdf>
- [https://en.wikipedia.org/wiki/Textile\\_manufacturing](https://en.wikipedia.org/wiki/Textile_manufacturing)
- <http://nptel.ac.in/courses/116102005/48>
- <http://nptel.ac.in/courses/116102005/49>
- <http://www.clothingstudy.com/yarn-numbering-system-yarn-count-direct-system-indirect-system/>
- [https://en.wikipedia.org/wiki/Units\\_of\\_textile\\_measurement](https://en.wikipedia.org/wiki/Units_of_textile_measurement)
- [https://www.uster.com/fileadmin/customer/Knowledge/Textile\\_Know\\_How/Yarn\\_clearing/UCQ\\_Analysis\\_of\\_yarns\\_be\\_a\\_sophisticated.pdf](https://www.uster.com/fileadmin/customer/Knowledge/Textile_Know_How/Yarn_clearing/UCQ_Analysis_of_yarns_be_a_sophisticated.pdf)



**Program Name** : Diploma in Fashion and Clothing Technology  
**Program Code** : DC  
**Semester** : Second  
**Course Title** : Basics of Fashion and Apparel  
**Course Code** : 22235

**1. RATIONALE**

Basics of Clothing Technology are the language of fashion technologist. The concepts of fashion and clothing are used in expressing the ideas, conveying the instructions that are used in carrying out the jobs on the shop floor, industries, assembly units, designing units etc. This course covers the knowledge and application of fashion and clothing concepts and finally enables him to use these concepts in different departments of fashion and clothing industry. The curriculum aims at developing the ability to identify the various clothing styles and use them in further adaptations or styles he is aiming to design. The subject focuses on developing imagination and translating ideas into sketches it also helps to develop the idea of visualizing the actual object or part on the basis of drawings. This preliminary course aims at building a foundation for the further courses related to fashion and clothing technology and other allied courses in coming semesters.

**2. COMPETENCY**

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

- Interpret the basic concepts from fashion and apparel industry.

**3. COURSE OUTCOMES (COs)**

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

- Apply the concept of fashion and clothing to given design / production related situation.
- Identify designs relating to fashion theories
- Classify the given garments on basis of clothing and fashion terminologies.
- Compare /correlate the types of market and fashion theories.
- Identify the process sequence of the garment industry.

**4. TEACHING AND EXAMINATION SCHEME**

Teaching Scheme				Credit (L+T+P)	Examination Scheme											
L	T	P	Theory						Practical							
			ESE		PA		Total		ESE		PA		Total			
Paper Hrs.		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
3	-	-	3	3	70	28	30*	00	100	40	--	--	--	--	--	--

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

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

**5. COURSE MAP (with sample COs, PrOs, UOs, ADOs and topics)**

This course map illustrates an overview of the flow and linkages of the topics at various levels of outcomes (details in subsequent sections) to be attained by the student by the end of the course, in all domains of learning in terms of the industry/employer identified competency depicted at the centre of this map.

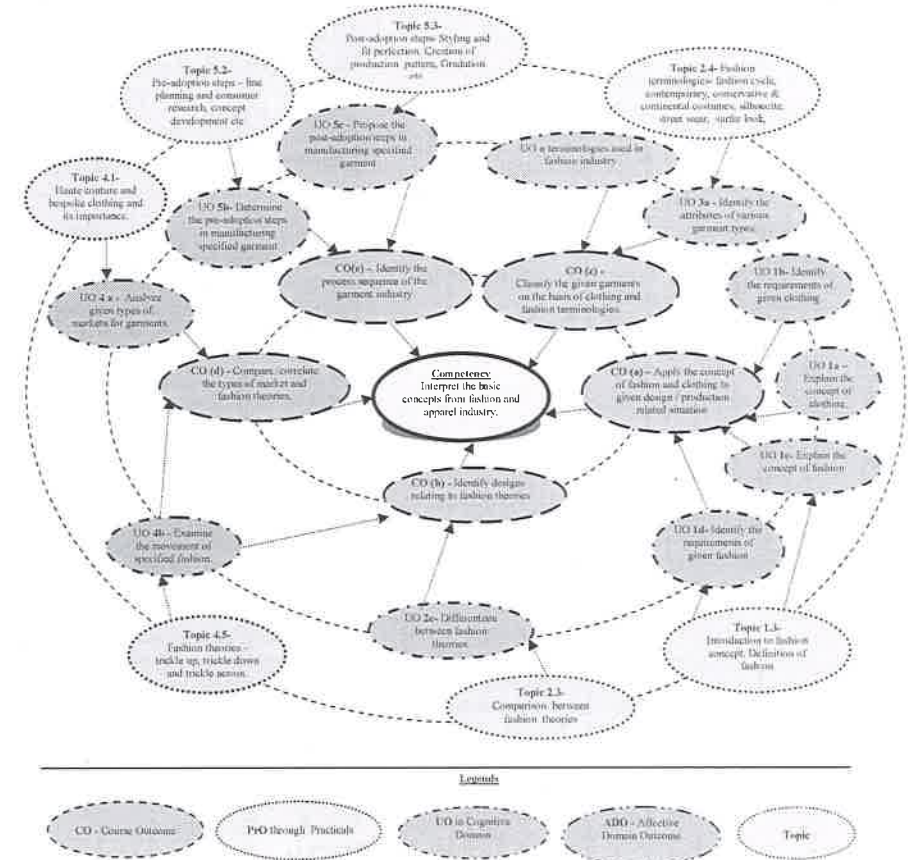


Figure 1 - Course Map

**6. SUGGESTED PRACTICALS/ EXERCISES**

- Not Applicable -

**7. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED**

- Not Applicable -



### 8. UNDERPINNING THEORY COMPONENTS

The following topics/ subtopics are to be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency:

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>Unit – I Concept of clothing and fashion</b>	1a. Explain the concept of clothing 1b. Identify the requirements of clothing 1c. Explain the concept of fashion 1d. Identify the requirements of fashion.	1.1 Introduction to clothing concept Definition of clothing 1.2 Introduction to clothing technology. Objectives of clothing technology 1.3 Introduction to fashion concept Definition of fashion 1.4 Introduction to fashion technology. Objectives of fashion technology
<b>Unit– II Fundamentals of Fashion</b>	2a. Describe various stages of fashion cycle 2b. Explain fashion theories. 2c. Differentiate between fashion theories. 2d. Describe the given fashion terminologies used in fashion industry.	2.1 Fashion cycle 2.2 Fashion theories – trickle up, trickle down and trickle across. 2.3 Comparison of fashion theories 2.4 Fashion terminologies: boutique, brand, collection, couture house, designer label, prêt-a-porter, silhouette, custom made, domestic market, fashion innovator, franchise, ethnic, haute couture, high fashion, knock offs, wardrobe, fashion year, fashion season, fashion followers, fashion forecast
<b>Unit– III Apparel Terminologies</b>	3a. Identify various apparel categories of men's wear, women's wear, kid's wear and innerwear. 3b. Identify given garment for women's wear category 3c. Identify given garment for men's wear category 3d. Identify given garment for kid's wear category	3.1 Apparel categories of Men's wear: shirts, polos, t-shirts, tanks, jeans, pants, joggers, shorts, bell- bottom, sweatshirts, hoodies 3.2 Apparel categories of Women's wear: Blouses, coats, jackets, , Kurti, halter top, tank top, tunics, crop tops, leggings, jeans, shorts, capris, trousers, palazzos, salwar, herum, baggies, hipster, circular skirt, wrap around skirts, gored skirt, trumpet, jumpsuit, evening gowns. 3.3 Apparel categories of Kids wear: Romper, dungarees, sleep suit, pinafore. 3.4 Apparel categories of Inner wear: lingerie
<b>Unit– IV Overview of Fashion Market</b>	4a. Identify different types of markets for garments. 4b. Differentiate between different market types. 4c. Describe importance of boutique. 4d. Examine the movement of fashion.	4.1 Haute couture/ bespoke clothing and its importance. 4.2 Prêt -a-porter and its importance. 4.3 Mass production and its importance. 4.4 Boutique and its importance.

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>Unit– V Organizing the Apparel Production Process</b>	5a. Evaluate the organizational structure for clothing industry. 5b. Determine the pre-adoption steps in garment manufacturing. 5c. Propose the post-adoption steps in garment manufacturing. 5d. Identify the role of merchandisers.	5.1 Organizational structure of Garment industry. 5.2 Pre-adoption steps – line planning and consumer research, concept development, quick costing, pattern development, preparing samples for various purpose, Line reviews- check on check, 5.3 Post-adoption steps- Styling and fit perfection, Creation of production pattern, Gradation, Production marker development, Final costing, Ware housing. 5.4 Merchandising – role of Merchandisers

*Note: To attain the COs and competency, above listed UOs need to be undertaken to achieve the 'Application Level' of Bloom's 'Cognitive Domain Taxonomy'.*

### 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	Concept of Clothing and Fashion	06	04	06	-	10
II	Fundamentals of Fashion	12	04	06	08	18
III	Apparel Terminologies	08	02	03	05	10
IV	Overview of Fashion Market	06	02	03	05	10
V	Organizing the Apparel Production Process	16	06	06	10	22
<b>Total</b>		<b>48</b>	<b>18</b>	<b>24</b>	<b>28</b>	<b>70</b>

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

*Note: This specification table provides general guidelines to assist student for their learning and to teachers to teach and assess with respect to attainment of UOs. The actual distribution of marks at different taxonomy levels (of R, U and A) in the question paper may vary 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:

- Student should maintain a notebook where all the new words which are used in the fashion market will be noted with meanings.
- Students should visit the clothing market where he will be familiar with various new trends in the market.
- Student will visit a garment manufacturing unit to understand about the production process sequence.



### 11. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES

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

- Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.
- 'L' in item No. 4 does not mean only the traditional lecture method, but different types of teaching methods and media that are to be employed to develop the outcomes.
- About *15-20% of the topics/sub-topics* which is relatively simpler or descriptive in nature is to be given to the students for *self-directed learning* and assess the development of the COs through classroom presentations (see implementation guideline for details).
- With respect to item No.10, teachers need to ensure to create opportunities and provisions for *co-curricular activities*.
- Guide student(s) in undertaking micro-projects.

### 12. SUGGESTED MICRO-PROJECTS

*Only one micro-project* is planned to be undertaken by a student assigned to him/her in the beginning of the semester. S/he ought to submit it by the end of the semester to develop the industry oriented COs. Each micro-project should encompass two or more COs which are in fact, an integration of PrOs, UOs and ADOs. The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. 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 total duration of the micro-project should not be less than *16 (sixteen) student engagement hours* during the course.

In the first four semesters, the micro-project could be group-based in groups of size 5-6. However, in higher semesters, it should be individually undertaken to build up the skill and confidence in every student to become problem solver so that s/he contributes to the projects of the industry. A suggestive list is given here. Similar micro-projects could be added by the concerned faculty:

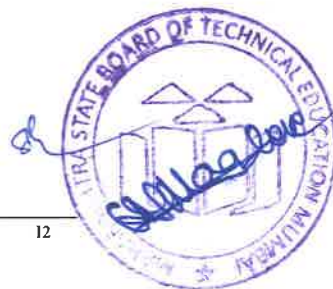
- Classification of garments:** Each student of the batch will classify the garment based on different looks such as surfer look, masculine, feminine, mod look.
- Market Survey:** Survey of different types of markets using various style-lines: Each student of a batch will select one style-line and classify garment types for the same.
- Manufacturing Analysis:** Identify the process sequence for given garment: The teacher will assign one garment and the students will identify the process sequence in manufacturing.
- Fashion Analysis:** Discover the movement of fashion for given style-line: Each batch will choose one style-line and students will discover the movement of fashion
- Picture Collection:** Collect pictures of historical costumes for Harappa, Mohenjodaro, Vedic Age
- Picture Collection:** Collect pictures of historical costumes for Egyptian, Greek, Roman and Chinese dresses
- Picture Classification:** Classify the garments according to wears such as formal wear, party wear etc, from images collected by students themselves.

### 13. SUGGESTED LEARNING RESOURCES

S. No.	Title of Book	Author	Publication
1.	Inside the fashion business	Dickerson K.G.	Pearson Education Pvt. Ltd., Singapore, ISBN: 9780130108555
2.	Fashion from Ancient Egypt to the present day	Mila Contini	West Duxbury; Manchester ISBN No. 9780517099872
3.	History of Fashion in 20th Century	Gertrud Lehnert	West Duxbury; Manchester ISBN No. 9783829020336

### 14. SOFTWARE/LEARNING WEBSITES

- <https://www.youtube.com>
- <https://www.fibertofashion.com>
- <https://www.yepme.com>









S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
	achromatic colour harmony.(Part-I)		
4	Develop, on paper, striped shirting design for office wear with achromatic colour harmony (Part-II)	II, III	02
5	Develop, on paper, checks shirting design for casual wear with monochromatic colour harmony (Part-I)	II, III	02
6	Develop, on paper, checks shirting design for casual wear with monochromatic colour harmony (Part-II)	II, III	02
7	Modify, on paper, the given colour on paper based on standard colour modification chart (Part-I)	III	02*
8	Modify, on paper, the given colour on paper based on standard colour modification chart (Part-II)	III	02
9	Develop, on paper, curtain material design with analogous colour harmony (Part-I)	II, III	02
10	Develop, on paper, curtain material design with analogous colour harmony (Part-II)	II, III	02
11	Develop, on paper, ladies dress material design with complementary colour harmony.(Part-I)	II, III	02
12	Develop, on paper, ladies dress material design with complementary colour harmony.(Part-II)	II, III	02
13	Develop, on paper, kids wear design with polychromatic colour harmony. (Part-I)	II, III	02
14	Develop, on paper, kids wear design with polychromatic colour harmony. (Part-II)	II, III	02
15	Develop, on paper, the chart for light theory of colour.(Part-I)	III	02
16	Develop, on paper, the chart for light theory of colour.(Part-II)	III	02
17	Develop, on paper, the chart for pigment theory of colour.(Part-I)	III	02
18	Develop, on paper, the chart for pigment theory of colour.(Part-II)	III	02
19	Develop, on paper, tints, tones and shades of any three colours. (Part-I)	III	02
20	Develop, on paper, tints, tones and shades of any three colours. (Part-II)	III	02
21	Develop, on paper, standard colour wheel. (Part-I)	III	02
22	Develop, on paper, standard colour wheel. (Part-II)	III	02
23	Compose all over textile design with diamond or ogee base. (Part-I)	IV	02*
24	Compose all over textile design with diamond or ogee base. (Part-II)	IV	02
25	Compose all over textile design with sateen or half drop base. (Part-I)	IV	02
26	Compose all over textile design with sateen or half drop base. (Part-II)	IV	02
27	Develop, on paper, Indian traditional motif (Part-I)	V	02*
28	Develop, on paper, Indian traditional motif (Part-II)	V	02
29	Develop school uniform for kids using pleats. (Part-I)	II,VI	02*
30	Develop school uniform for kids using pleats. (Part-II)	II,VI	02
31	Develop, on paper, party wear for teenager using decorative motif.	II,VI	02



S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
	(Part-I)		
32	Develop, on paper, party wear for teenager using decorative motif (Part-II)	II,VI	02
<b>Total</b>			<b>64</b>

**Note**

- A suggestive list of PrOs is given in the above table. More such PrOs can be added to attain the COs and competency. A judicious mix of minimum 24 or more practical need to be performed, out of which, the practicals marked as '\*' are compulsory, so that the student reaches the 'Precision Level' of Dave's 'Psychomotor Domain Taxonomy' as generally required by the industry.
- The 'Process' and 'Product' related skills associated with each PrO is to be assessed according to a suggested sample given below:

S. No.	Performance Indicators	Weightage in %
1	Preparation of colour	20
2	Choice of motif	20
3	Painting skills	10
4	Choice of colour harmony	20
5	Development of textile design	15
6	Presentation of output	10
7	Submission of report in time	5
<b>Total</b>		<b>100</b>

The above PrOs also comprise of the following social skills/attitudes which are Affective Domain Outcomes (ADOs) that are best developed through the laboratory/field based experiences:

- Follow safety practices.
- Practice good housekeeping.
- Demonstrate working as a leader/a team member.
- Maintain tools and equipment.
- Follow ethical practices.

The ADOs are not specific to any one PrO, but are embedded in many PrOs. Hence, the acquisition of the ADOs takes place gradually in the student when s/he undertakes a series of practical experiences over a period of time. Moreover, the level of achievement of the ADOs according to Krathwohl's 'Affective Domain Taxonomy' should gradually increase as planned below:

- 'Valuing Level' in 1<sup>st</sup> year
- 'Organising Level' in 2<sup>nd</sup> year and
- 'Characterising Level' in 3<sup>rd</sup> year.

**7. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED**

The major equipment with broad specification mentioned here will usher in uniformity in conduct of experiments, as well as aid to procure equipment by authorities concerned.

S. No.	Equipment Name with Broad Specifications	Exp. S. No.
1	Pencil – HB	1 to 16
2	Tracing paper – Gateway quality	1 to 16
3	Drawing sheet – A4 size	1 to 16
4	Poster colours	1 to 16
5	Colouring brush – round (0, 2, 4), flat (1/2")	1 to 16
6	Bow pen	1 to 16
7	Bow compass	1 to 16

### 8. UNDERPINNING THEORY COMPONENTS

The following topics/subtopics are to be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency:

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>Unit – I Elements of Art and Fashion Design</b>	1a. Select/ draw/Identify the given lines according to use. 1b. Identify the given direction and shape with justification. 1c. Select the size and texture for developing the given design with justification. 1d. Describe the effect of different combinations of values and colours for the given situation. 1e. Compare the features of the specified types of designs with respect to designers.	1.1 Line – concept, definition, types of line 1.2 Direction – types 1.3 Shape – definition, types 1.4 Size – concept, types 1.5 Texture – concept and application 1.6 Value – concept, use 1.7 Colour – definition, sensation process and use 1.8 Form – concept, use 1.9 Concept and definition of design 1.10 Designer types – industrial, graphic, textile and fashion
<b>Unit– II Principles of Design</b>	2a. Identify the principle of design in given sample. 2b. Use of principles of design to create the given type of design. 2c. Differentiate between the given structural and decorative design. 2d. Compare the concepts of the given style, fad and trend.	2.1 Repetition – technical concept, Alternation – size, direction, colour, shape, permutation and combination, Harmony – pure and discord, Gradation – shape, size and colour, Contrast – colour and value, Unity – concept development, Balance – formal and informal balance 2.2 Dominance and sub-ordination – concept and application 2.3 Overview: Types of Structural design and Decorative design. 2.4 Concepts of style, fad and classic.
<b>Unit– III Colour Theories and Harmonies</b>	3a. Differentiate between the specified features of the light theory and pigment theory. 3b. Modify the given colours as per the given design.	3.1 Light theory of colour – chromatic circle, colour vision 3.2 Pigment theory of colour – colour wheel, attributes of primary and secondary colours.

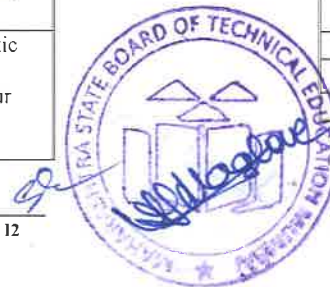
Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
	3c. Develop the given design with various colour harmonies. 3d. Evaluate the effect of the specified textile substrate.	3.3 Colour modification – concept, need and requirements. 3.4 Colour harmony – achromatic, monochromatic, analogous, complementary, polychromatic. 3.5 Effect of textile substrate on appearance of colour and simple colour and weave effects.
<b>Unit-IV Composition of Textile Design and Traditional Textile Designs</b>	4a. Compose the given all over textile design. 4b. Construct the given designs with various bases. 4c. Identify the given designs from Indus Valley civilization with justification. 4d. Draw the given traditional textile designs. 4e. Describe the material, weave and colours used in the specified shawls of India.	4.1 All over repeating design. 4.2 Drop based designs – half, full, drop reverse and universe, diamond, ogee, sateen (regular and irregular). 4.3 Indus valley civilization. 4.4 Indian brocades. 4.5 Shawls of India, Indian embroidery, Indian dyed and printed fabrics.
<b>Unit-V Psychology of Clothing</b>	5a. Predict the first impression of specified personality with reference to fashion. 5b. Justify the factors responsible for consumer buying. 5c. Explain the given fashion propagation for specified trend with justification.	5.1 First impression. 5.2 Role of social, psychological and economical aspects of clothing. 5.3 Origin of fashion and fashion propagation

Note: To attain the COs and competency, above listed UOs need to be undertaken to achieve the 'Application Level' of Bloom's 'Cognitive Domain Taxonomy'.

### 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	Elements of Art and Fashion Design	10	2	4	4	10
II	Principles of Design	16	4	4	6	14
III	Colour Theories and Harmonies	12	2	4	4	10
IV	Composition of Textile Design and Traditional Textile Designs	10	2	6	10	18
V	Traditional Textile Designs	10	4	6	--	10
VI	Psychology of Clothing	06	4	2	2	08
<b>Total</b>		<b>64</b>	<b>18</b>	<b>26</b>	<b>26</b>	<b>70</b>

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



**Note:** This specification table provides general guidelines to assist student for their learning and to teachers to teach and assess with respect to attainment of UOs. The actual distribution of marks at different taxonomy levels (of R, U and A) in the question paper may vary 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:

- Collect different fashion sketches and identify the types of line and their characteristics from these fashion sketches.
- Identify and compare different principles of designs from different garments.
- Boutique survey for current fashion trends.
- Prepare power point presentation for showing different types of traditional textile designs.
- Conduct a survey of people belonging to different professions to know the psychology of individual about clothing.

#### 11. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES

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

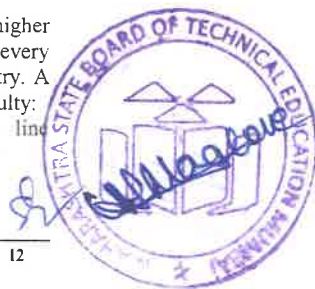
- Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.
- 'L' in item No. 4 does not mean only the traditional lecture method, but different types of teaching methods and media that are to be employed to develop the outcomes.
- About 15-20% of the topics/sub-topics which is relatively simpler or descriptive in nature is to be given to the students for *self-directed learning* and assess the development of the COs through classroom presentations (see implementation guideline for details).
- With respect to item No.10, teachers need to ensure to create opportunities and provisions for *co-curricular activities*.
- Present a seminar on a relevant topic.
- Guide student(s) in undertaking micro-projects.

#### 12. SUGGESTED MICRO-PROJECTS

*Only one micro-project* is planned to be undertaken by a student assigned to him/her in the beginning of the semester. S/he ought to submit it by the end of the semester to develop the industry oriented COs. Each micro-project should encompass two or more COs which are in fact, an integration of PrOs, UOs and ADOs. The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. 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 total duration of the micro-project should not be less than 16 (*sixteen student engagement hours*) during the course.

In the first four semesters, the micro-project could be group-based. However, in higher semesters, it should be individually undertaken to build up the skill and confidence in every student to become problem solver so that s/he contributes to the projects of the industry. A suggestive list is given here. Similar micro-projects could be added by the concerned faculty:

- Line:** Each batch will develop the decorative motifs using different line characteristics.



- Elements of art:** Each batch will develop the designs using combination of elements of art.
- Elements of fashion design:** Students will select fifty different garments from website or photographs from market and classify the designs as structural and decorative.
- Colour theories:** Students will select fifty different garments and identify the colour harmony.
- Traditional textile design:** Each batch of students will collect 10 pictures for given base of textile design.
- Psychology of clothing:** Each student will conduct survey of mixed group of population of about twenty persons to find out their criteria of selection of purchasing of specific garment such as regular wear, season specific wear or party wear. The students should develop a questionnaire for this purpose.

#### 13. SUGGESTED LEARNING RESOURCES

S. No.	Title of Book	Author	Publication
1	Inside The Fashion Business	Dickerson K. G.	Pearson Education Private Limited, Singapore ISBN-9780130108555
2	Elements of Fashion and Design	Gertrude Lehnert	West Duxbury, Manchester ISBN-9783829020336
3	Watson's Textile Design and Colour	Grosicki Z.	Universal Publishing Corporation – London ISBN-9781855739956
4	History of Textile Design	Shenai V. A.	Sevak Publication, Mumbai. 1977.
5	Instruction Package on Application of Art and Design to Textile	Sadhale C. R.	Private circulation TTTI, Bhopal and DKTE, Ichalkaranji.

#### 14. SOFTWARE/LEARNING WEBSITES

- [www.fibertofashion.com](http://www.fibertofashion.com)
- [www.youtube.com/](http://www.youtube.com/) light and pigment theory and similar links
- [www.wikipedia.com/](http://www.wikipedia.com/) colour harmonies and similar links
- [www.yepme.com](http://www.yepme.com)
- [www.myntra.com](http://www.myntra.com)
- [www.onlineclothingstudy.com](http://www.onlineclothingstudy.com)

**Program Name** : Diploma in Fashion and Clothing Technology  
**Program Code** : DC  
**Semester** : Second  
**Course Title** : Pattern Making  
**Course Code** : 22237

**1. RATIONALE**

Pattern making is the heart of garment industry. The student should be able to develop pattern by following appropriate process. Knowledge on human body measurement and creation of pattern for customers plays vital role in fashion industry. Skills in simple pattern making are to be developed in students through this course. Student should be able to apply the science of measuring human sizes and creating pattern from the measurement. Students should develop commercial pattern from the basic pattern.

**2. COMPETENCY**

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

- Create garment patterns by drafting methods.

**3. COURSE OUTCOMES (COs)**

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

- Measure body, dummy and garments by selecting relevant measurement techniques
- Interpret the principles and symbols used in pattern making.
- Draft the specified basic bodice and adapted patterns Sleeves and Collars for kids wear.
- Manipulate different Patterns by using Basic bodice block for women with different sleeves and Collars.
- Draft the basic men's Trouser and Basic shirt with different collars and Sleeves.

**4. TEACHING AND EXAMINATION SCHEME**

Teaching Scheme			Credit (L+T+P)	Examination Scheme												
L	T	P		Theory						Practical						
				ESE		PA		Total		ESE		PA		Total		
Paper Hrs.	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min		
2	-	4	6	3	70	28	30*	00	100	40	50#	20	50	20	100	40

(\*): Under the theory PA, Out of 30 marks, 10 marks are for micro-project assessment to facilitate integration of COs and the remaining 20 marks is the average of 2 tests to be taken during the semester for the assessment 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, ESE - End Semester Examination; PA - Progressive Assessment

**5. COURSE MAP** (with sample COs, PrOs, UOs, ADOs and topics)

This course map illustrates an overview of the flow and linkages of the topics at various levels of outcomes (details in subsequent sections) to be attained by the student by the end of the course, in all domains of learning in terms of the industry/employer identified competency depicted at the centre of this map.

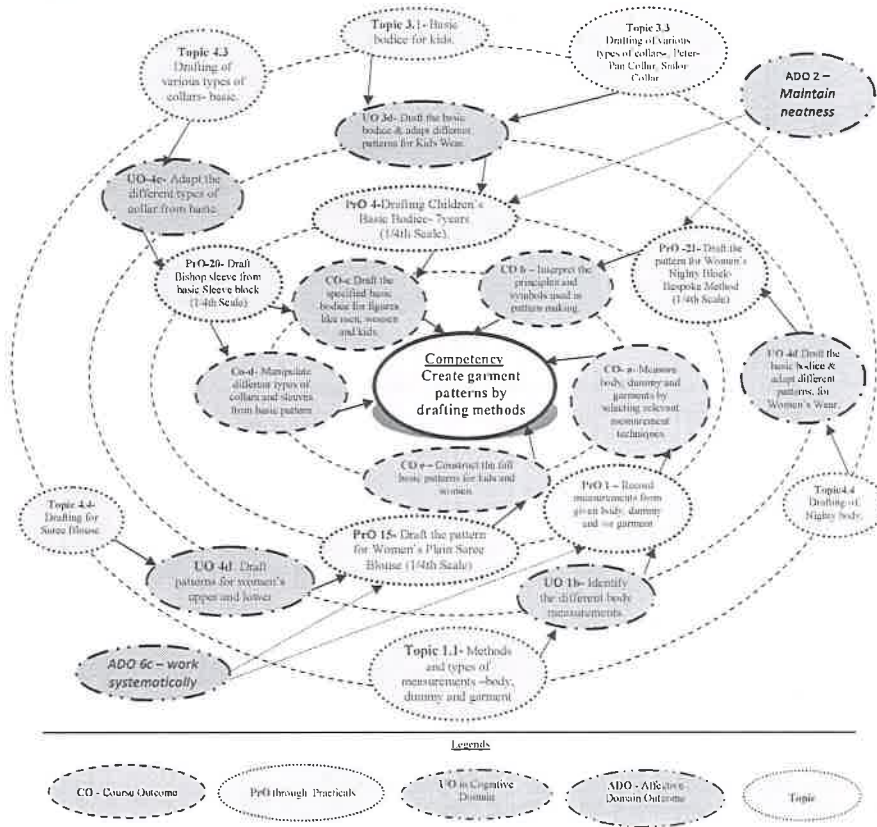


Figure 1 - Course Map

**6. SUGGESTED PRACTICALS/ EXERCISES**

The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency.

S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
1.	Record measurements from given body, dummy and/ or garment.	I	02*
2.	Demonstrate pattern making tools and symbols.	II	02*
3.	Draft Children's Basic Bodice- 7years (1/4th Scale)- Part I	III	02*
4.	Draft Children's Basic Bodice- 7years (1/4th Scale)-Part II	III	02



S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
5.	Draft Plain sleeve of Children's Basic Bodice- 7years (1/4th Scale)	III	02
6.	Draft the pattern for A-line frock (1/4th Scale) Part I	III	02
7.	Draft the pattern for A-line frock (1/4th Scale) Part II	III	02
8.	Adapt the Puff sleeve from the basic sleeve.	III	02
9.	Draft the pattern for Waist-Line Frock (1/4th Scale) Part-I	III	02
10.	Draft the pattern for Waist-Line Frock (1/4th Scale) Part-II	III	02
11.	Draft the pattern for Boys Shorts (1/4th Scale) Part-I	III	
12.	Draft the pattern for Boys Shorts (1/4th Scale) Part-II	III	02
13.	Draft the pattern for Sun suit (1/4th Scale) Part-I	III	
14.	Draft the pattern for Sun suit (1/4th Scale) Part-II	III	02
15.	Draft the pattern for Female Basic Skirt (1/4th Scale)-Part-I	IV	02*
16.	Draft the pattern for Female Basic Skirt (1/4th Scale)-Part-II	IV	02
17.	Draft the pattern for Female Close Fitting Basic Bodice (1/4th Scale)-Part-I	IV	02
18.	Draft the pattern for Female Close Fitting Basic Bodice (1/4th Scale)-Part-II	IV	02
19.	Draft the basic Sleeve block for Close Fitting Basic Bodice (1/4th Scale)-	IV	02
20.	Draft Bishop sleeve from basic Sleeve block (1/4th Scale)	IV	02
21.	Draft the pattern for women's Nighty Block by using Bespoke method (1/4th Scale)-Part-I	IV	02
22.	Draft the pattern for women's Nighty Block by using Bespoke method (1/4th Scale)-Part-II	IV	02
23.	Draft the pattern for Kameez for Women (1/4th Scale)	IV	02
24.	Draft the pattern for Salwar for women (1/4th Scale)	IV	02
25.	Draft the pattern for Women's Plain Saree Blouse (1/4th Scale) Part-I	IV	02
26.	Draft the pattern for Women's Plain Saree Blouse (1/4th Scale) Part-II	IV	02
27.	Draft the pattern for Men's basic Shirt Block (1/4th Scale)	V	02*
28.	Draft the pattern for Men's basic Sleeve with Cuff and Collar (1/4th Scale)	V	02
29.	Draft the pattern for Men's Fla: Front Trouser Block (1/4th Scale)-Part-I	V	02
30.	Draft the pattern for Men's Fla: Front Trouser Block (1/4th Scale)-Part-II	V	02
<b>Total</b>			<b>60</b>

**Note**

- A suggestive list of PrOs is given in the above table. More such PrOs can be added to attain the COs and competency. A judicious mix of minimum 24 or more practicals need to be performed, out of which, the practicals marked as "\*" are compulsory, so that the student reaches the 'Precision Level' of Dave's 'Psychomotor Domain Taxonomy' as generally required by the industry.
- The 'Process' and 'Product' related skills associated with each PrO is to be assessed according to a suggested sample given below:



S. No.	Performance Indicators	Weightage in %
1	Use of measurement tools	10
2	Follow the drafting principles correctly	30
3	Use of pattern making tools properly	20
4	Indicate the symbols and landmarks in pattern drafting.	10
5	Presentation of output.	10
7	Answer to sample questions	10
8	Submit report in time	10
<b>Total</b>		<b>100</b>

The above PrOs also comprise of the following social skills/attitudes which are Affective Domain Outcomes (ADOs) that are best developed through the laboratory/field based experiences:

- Follow safety practices.
- Practice good housekeeping.
- Demonstrate working as a leader/a team member.
- Maintain tools and equipment.
- Follow ethical practices.

The ADOs are not specific to any one PrO, but are embedded in many PrOs. Hence, the acquisition of the ADOs takes place gradually in the student when s/he undertakes a series of practical experiences over a period of time. Moreover, the level of achievement of the ADOs according to Krathwohl's 'Affective Domain Taxonomy' should gradually increase as planned below:

- 'Valuing Level' in 1<sup>st</sup> year
- 'Organising Level' in 2<sup>nd</sup> year
- 'Characterising Level' in 3<sup>rd</sup> year.

**7. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED**

The major equipment with broad specification mentioned here will usher in uniformity in conduct of experiments, as well as aid to procure equipment by authorities concerned.

S. No.	Equipment Name with Broad Specifications	Experiment S.No.
1	Standard dummies	I
2	<b>Measuring Tools</b> -Scale Triangle, measuring tape, flexi tape, French curve <b>Tracing Tools</b> - Tailors Chalk Tracing paper, Carbon Paper, Tracing wheel. <b>Cutting Tool</b> - Scissors, Shears, Pinking shears.	I, 3 to 30
3	Stationary material such as pencil, eraser, scale, Brown Paper, Drafting Book(Journal).	All

**8. UNDERPINNING THEORY COMPONENTS**

The following topics/ subtopics are to be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency:

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>Unit – I Measurements</b>	1a. Choose the correct method of measurement with justification. 1b. Take relevant body measurements for a given garment. 1c. Identify for the given standard size charts from different countries with justification. 1d. Select the appropriate measuring tools for the given job with justification.	1.1 Methods of measurements – Measuring from body, dummy and readymade garment. 1.2 Measurement Types- vertical, horizontal and circumferential measurements 1.3 Standard measurement charts. 1.4 Measuring Tools- Measuring tape, ruler, L-scale, 1/4th scale, flexi tape 1.5 Tracing Tool- Tracing Wheel, Tailors Chalk, Carbon Paper, Tracing Paper, Marking Pen and Pencils. 1.6 Cutting Tools- Scissors, Pinking shear, notcher
<b>Unit– II Techniques of Pattern Making</b>	2a. Interpret principles involved for the given pattern making. 2b. Interpret the give pattern making terminologies. 2c. Describe with sketches the symbols and landmarks for the given pattern making. 2d. Choose relevant techniques and methods for the given patterns with justification.	2.1 Introduction to pattern making- definitions Introduction to pattern Making Principles 2.2 Basic terminologies- selvedge, grain-line, on-grain, cross-grain, bias-grain, length-grain, true-bias, bust point, Dart 2.3 Symbols and landmark terms used in pattern making 2.4 Techniques in pattern making- Drafting and Draping techniques 2.5 Methods of pattern making- bespoke, industrial method. 2.6 Types of patterns-Basic block and adaptation
<b>Unit– III Drafting for Kids Wear</b>	3a. Interpret the specified concepts involved in basic bodice drafting for Boys and Girls. 3b. Select the types of sleeves for given job with justification. 3c. Choose the types of collars for given job with justification. 3d. Draft the basic bodice a adapt different patterns for given Kids Wear.	3.1 Introduction to various garment components: Sleeve, Collar, Fly, Basic bodice for kids, 3.2 Drafting of various types of sleeves- Plain Sleeve, Puff Sleeve, Bell Sleeves, Tulip. 3.3 Drafting of various types of collars-, Peter-Pan Collar, Sailor Collar., 3.4 Drafting of A-line frock, Drafting of Waist line frock, Drafting of Boy’s Shorts.
<b>Unit– IV Drafting for Women’s Wear</b>	4a. Interpret the specified concepts involved in the given bodice drafting for Women’s Wear. 4b. Select the sleeves for the	4.1 Close fitting bodice block for women, Introduction to various garment components -Sleeves and Collars 4.2 Drafting of various types of sleeves- Plain Sleeve, Cap Sleeve Bishop Sleeve, Leg of

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
	given job with justification. 4c. Choose the collar for the given job with justification. 4d. Draft the basic bodice for given pattern of Women’s Wear.	mutton sleeve, Kimono, Dolman, Megyar sleeve, 4.3 Drafting of various types of collars-, Stand Collar, Shawl Collar. 4.4 Drafting of Kameez, Salwar, Nighty, Drafting of Saree Blouse.
<b>Unit– V Drafting for Men’s Wear</b>	5a. Draft the given shirt block for men. 5b. Select the relevant type of sleeves for the given job with justification. 5c. Select the relevant type of collars for the given job with justification. 5d. Draft Trouser Block for the given specifications.	5.1 Drafting of Men’s Shirt block. 5.2 Drafting of sleeves- Shirt Sleeve, Raglan Sleeves 5.3 Drafting of Collars- Shirt Collar, Roll Collar. 5.4 Drafting of Men’s Trouser Block.

*Note: To attain the COs and competency, above listed UOs need to be undertaken to achieve the ‘Application Level’ of Bloom’s ‘Cognitive Domain Taxonomy’.*

**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	Measurements	04	02	06	-	08
II	Techniques of Pattern Making	04	02	02	06	10
III	Drafting for Kids Wear	08	02	06	08	16
IV	Drafting for Women’s Wear	08	02	06	10	18
V	Drafting for Men’s Wear.	08	02	06	10	18
<b>Total</b>		<b>32</b>	<b>10</b>	<b>26</b>	<b>34</b>	<b>70</b>

*Legends: R=Remember, U=Understand, A=Apply and above (Bloom’s Revised taxonomy)  
 Note: This specification table provides general guidelines to assist student for their learning and to teachers to teach and assess with respect to attainment of UOs. The actual distribution of marks at different taxonomy levels (of R, U and A) in the question paper may vary 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:

- Student will maintain a separate notebook for various pattern making terminologies and symbols used in fashion industry.
- Students will visit garment factory to learn about the importance of garment measurements for domestic and export purpose.
- Students will visit boutique to learn about the importance of garment measurements.
- Students will prepare basic patterns for their family members of different age groups.





### 11. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES

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

- Guide student(s) in measuring from various dummies.
- Show video/animation films for taking measurements.
- Demonstrate the use of French curve.
- Provide standard charts developed by experienced faculty to teach standard symbols.
- Massive open online courses (**MOOCs**) may be used to teach various topics/sub topics.
- 'L' in item No. 4 does not mean only the traditional lecture method, but different types of teaching methods and media that are to be employed to develop the outcomes.
- About 15-20% of the topics/sub-topics which is relatively simpler or descriptive in nature is to be given to the students for *self-directed learning* and assess the development of the COs through classroom presentations (see implementation guideline for details).
- With respect to item No.10, teachers need to ensure to create opportunities and provisions for *co-curricular activities*.
- Guide student(s) in undertaking micro-projects.

### 12. SUGGESTED LIST OF MICRO PROJECTS

Only one micro-project is planned to be undertaken by a student assigned to him/her in the beginning of the semester. S/he ought to submit it by the end of the semester to develop the industry oriented COs. Each micro-project should encompass two or more COs which are in fact, an integration of PrOs, UOs and ADOs. The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. 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 total duration of the micro-project should not be less than 16 (sixteen) student engagement hours during the course.

In the first four semesters, the micro-project could be group-based. However, in higher semesters, it should be individually undertaken to build up the skill and confidence in every student to become problem solver so that s/he contributes to the projects of the industry. A suggestive list is given here. Similar micro-projects could be added by the concerned faculty:

- Measurements:** Each batch of students will compare standard measurements charts between any two countries.
- Techniques of pattern making:** Each student will compare the methods of pattern making.
- Drafting of basic bodice:** Each student will draft the basic bodice for his/her own measurements.
- Drafting of garment components:** Each student will sketch any five adapted sleeve and collar and draft the same for given measurement.
- Drafting of basic garment:** Each student will draft any two basic garments for his/her own measurements.

### 13. SUGGESTED LEARNING RESOURCES

S. No.	Title of Book	Author	Publication
--------	---------------	--------	-------------

S. No.	Title of Book	Author	Publication
1.	Zarapkar System of Cutting	Zarapkar, K.R.	Sale Publishers, Bombay ISBN: 9788124301999
2.	Pattern Making for fashion Design	Armstrong, Helen Joseph	Harper Collins, LA ISBN: 9780136069348
4.	Metric Pattern Cutting	Aldrich, Winifred	Balckwell Science Ltd., London ISBN: 978-1-4443-0929-4
5.	Pattern Cutting Made Easy	Holman, Gillian	Balckwell Science Ltd., London ISBN: 9780713480931
6.	More Dress Pattern Designing	Bray, Natalie	Balckwell Science Ltd., London ISBN: 978-0632065028
7.	Master patterns and grading for women's outsize	Cooklin, Gerry	Balckwell Science Ltd. London ISBN: 9780632039159
8.	Master patterns and grading for men's outsize	Cooklin, Gerry	Balckwell Science Ltd. London ISBN: 9780632039158

### 14. SOFTWARE/LEARNING WEBSITES

- [www.fibert2fashion.com](http://www.fibert2fashion.com)
- [www.onlineclothingstudy.com](http://www.onlineclothingstudy.com)
- [www.youtube.com](http://www.youtube.com)
- [www.gerberttechnology.com](http://www.gerberttechnology.com)
- [www.biop.co.in](http://www.biop.co.in)



**Program Name** : Diploma in Fashion and Clothing Technology  
**Program Code** : DC  
**Semester** : Second  
**Course Title** : Elements of Mechanical, Electrical and Electronics Engineering  
**Course Code** : 22238

**1. RATIONALE**

Mechanical, electrical and electronics appliances, equipment are the most essential inputs of any garment industry. Various textile/garment machines and other services like air conditioning, ventilation, water supply, lighting, etc. are powered by electrical energy. The diploma engineer must have knowledge of machines, materials, mechanisms, transmission systems, different types of motors, their working, billing of electrical energy and the safety measures while working in garment industry. Along with this, garment machine manufacturers have introduced many electronic devices for various purposes such as: to indicate, to measure and to control various units of garment processes. This course is developed in the way by which fundamental information will help the diploma engineers to apply the basic concepts and principles of mechanical, electrical and electronic engineering in various engineering applications to solve broad based problems.

**2. COMPETENCY**

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

- Use mechanical, electrical and electronics equipment in fashion and clothing industry safely.

**3. COURSE OUTCOMES (COs)**

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

- Use laws of machines and materials in garment manufacturing plant.
- Select transmission drives for garment manufacturing machines.
- Estimate parameters to solve energy bill problems.
- Use electrical devices, meters and lamps in apparel industry effectively.
- Identify application of different types of electronic components in the equipment used in garment industries.
- Use sensors and microprocessor in garment industries effectively.

**4. TEACHING AND EXAMINATION SCHEME**

Teaching Scheme				Examination Scheme												
L	T	P	Credit (L+T+P)	Theory						Practical						
				ESE		PA		Total		ESE		PA		Total		
				Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
3	-	2	5	3	70	28	30*	00	100	40	25@	10	25	10	50	20

(\*): Under the theory PA, Out of 30 marks, 10 marks are for micro-project assessment (5 marks each for Physics and Chemistry) to facilitate integration of COs and the remaining 20

marks is the average of 2 tests to be taken during the semester for the assessment of the UOs required for the attainment of the COs.

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

**5. COURSE MAP ((with sample COs, PrOs, UOs, ADOs and topics)**

This course map illustrates an overview of the flow and linkages of the topics at various levels of outcomes (details in subsequent sections) to be attained by the student by the end of the course, in all domains of learning in terms of the industry/employer identified competency depicted at the centre of this map.

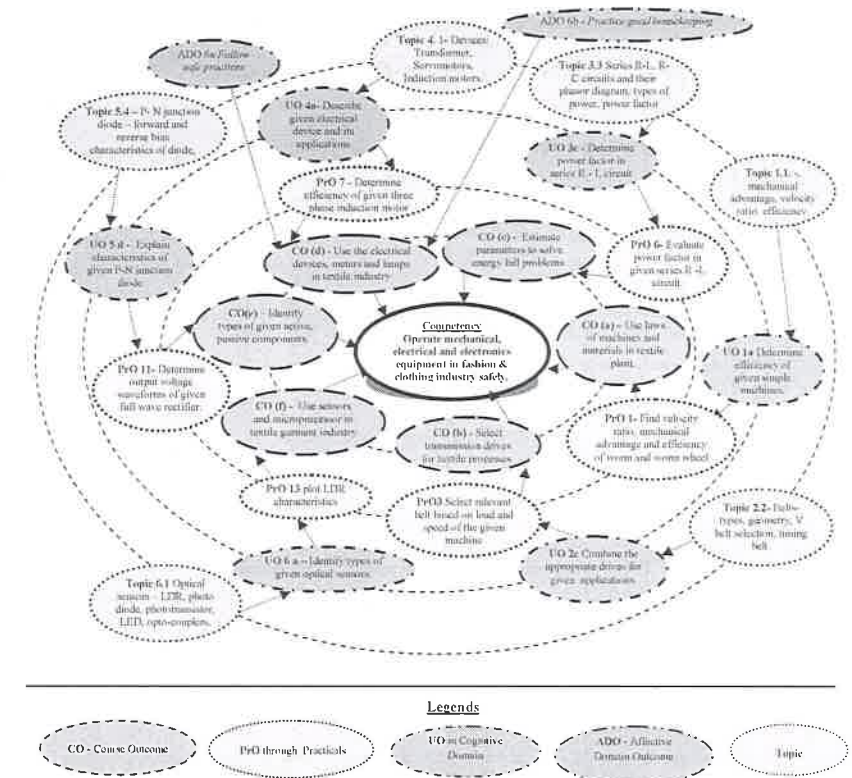


Figure 1 - Course Map

**6. SUGGESTED PRACTICALS/ EXERCISES**

The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency



S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
<b>Mechanical</b>			
1	Find velocity ratio, mechanical advantage and efficiency of given worm and worm wheel arrangement.	I	02*
2	Determine strain and stress in the given spring.	I	02
3	Select relevant belt for a given machine based on load and speed of the machine.	II	02*
4	Select relevant chain for a given machine based on load and speed of the machine.	II	02
<b>Electrical</b>			
5	Find the currents and voltages in a given circuit using Kirchhoff's Laws.	III	02*
6	Evaluate the power factor in given series R and L circuit.	III	02
7	Determine the efficiency of given three phase induction motor by direct loading.	IV	02
8	Identify different components of Compact Fluorescent Lamp (CFL) and Light Emitting Diode(LED) lamps.	IV	02
<b>Electronics</b>			
9	Identify different active and passive electronic components.	V	02
10	Evaluate V-I characteristics of forward and reverse bias of diode.	V	02
11	Determine the input and output voltage waveforms of full wave rectifier.	V	02*
12	Measure water temperature using RTD (Resistance temperature detector).	VI	02
13	Test the functioning of the LDRs (Light dependent resistors)	VI	02
14	Measure displacement using given LVDT (Linear variable differential transducer).	VI	02*
<b>Total</b>			<b>28</b>

**Note**

i. A suggestive list of PrOs is given in the above table. More such PrOs can be added to attain the COs and competency. A judicious mix of minimum 12 or more practical need to be performed, out of which, the practicals marked as '\*' are compulsory, so that the student reaches the 'Precision Level' of Dave's 'Psychomotor Domain Taxonomy' as generally required by the industry.

ii. The 'Process' and 'Product' related skills associated with each PrO is to be assessed according to a suggested sample given below:

S. No.	Performance Indicators	Weightage in %
1	Selection of suitable component, apparatus/instrument	20
2	Preparation of experimental set up	10
3	Setting and operation	10
4	Safety measures	10
5	Observations and Recording	10
6	Interpretation of result and Conclusion	20
7	Answer to sample questions	10
8	Submission of report in time	10
<b>Total</b>		<b>100</b>

The above PrOs also comprise of the following social skills/attitudes which are Affective Domain Outcomes (ADOs) that are best developed through the laboratory/field based experiences:

- a. Follow safety practices.
- b. Practice good housekeeping.
- c. Demonstrate working as a leader/a team member.
- d. Maintain tools and equipment.
- e. Follow ethical practices.

The ADOs are not specific to any one PrO, but are embedded in many PrOs. Hence, the acquisition of the ADOs takes place gradually in the student when s/he undertakes a series of practical experiences over a period of time. Moreover, the level of achievement of the ADOs according to Krathwohl's 'Affective Domain Taxonomy' should gradually increase as planned below:

- 'Valuing Level' in 1<sup>st</sup> year
- 'Organising Level' in 2<sup>nd</sup> year and
- 'Characterising Level' in 3<sup>rd</sup> year.

**7. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED**

The major equipment with broad specification mentioned here will usher in uniformity in conduct of experiments, as well as aid to procure equipment by authorities concerned.

S. No.	Equipment Name with Broad Specifications	Exp. S. No.
1	Weights 50gm, 100gm, 200gm, 500gm, 1000gm (three pieces of each)	1,2
2	Worm and worm wheel arrangement	1
3	Various belts and industrial v belt chart	3
4	1 meter steel rule, half meter steel rule	1,2
5	Actual belts, chains commonly used in textile industries	3,4
6	Dimmerstat - 1 kVA, 0-260V AC	5,6
7	Resistance -290 Ω, 100 Ω	5,6
8	Digital multimeter : 3 1/2 digit display, 9999 counts digital multimeter measures: V <sub>ac</sub> , V <sub>dc</sub> ( 1000V max), A <sub>dc</sub> , A <sub>ac</sub> (10 amp max), (0 - 200Hz), resistance ( 0 - 100 mΩ), capacitance and temperature	5,6,7, 8,9, 10
9	Wattmeter 1A (1 no.), wattmeter 5A ( 2 no.s)	6,7
10	Three phase induction motor 3 HP, three phase, 440V AC	7
11	Ammeter 0-3-10-30 A AC/DC	5,6,7
12	Voltmeter 0-150-300V AC/DC	5,6,7
13	Tachometer for speed measurement 0-3000 rpm	7
14	Different types of LED and CFL lamp	8
15	Resistors, capacitors, inductors, diodes, transistors of different values/ types	9
16	Diode characteristics kit, ammeter 0-5-10-50 milliamp, ammeter, 0-50-500-1000 micro amp, 32 V d. c. power supply, and connecting cords	10
17	Full wave rectifier kit, CRO, probe, connecting cords	11
18	RTD experiment kit, RTD pt-100, resistance 100 Ω at 0°C and 138.4 Ω at 100°C, temp. range 200 to 850°C	12
19	LDR experiment kit, connecting cords, LDR VT935G - voltage rating 100 V.	13



S. No.	Equipment Name with Broad Specifications	Exp. S. No.
	dark resistance – 1 m $\Omega$ , resistance @lux – 40.5 k $\Omega$	
20	LVDI experiment kit, connecting cords. Measuring ranges +/- 1 to 10 mm, linearity +/- 0.3% FSO (Full scale output)	14

### 8. UNDERPINNING THEORY COMPONENTS

The following topics/subtopics are to be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency.

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>Unit –I Machine and Materials</b>	1a. Determine efficiency of the given simple machines. 1b. Construct graphs of load versus effort for the given simple machine. 1c. Identify stresses in various components of the given machines 1d. Explain various properties of the given materials with help of stress strain diagram. 1e. Explain calculation of factor of safety with relevance to the given situation.	1.1 Machines - mechanical advantage, velocity ratio, efficiency, Law of machine, reversible machine. 1.2 Simple stresses and strains – stress, strain, types of stresses, (simple numerical). 1.3 Hooke's law, elastic limit, Modulus of elasticity, modulus of rigidity, ultimate stress, working stress. 1.4 Stress strain diagram for ductile material, yield point 1.5 Factor of safety
<b>Unit-II Mechanisms and Transmission</b>	2a. Describe the geometry of the given belt and chain drives. 2b. Explain the given inversion mechanism 2c. Select the configuration for the drives for the given application. 2d. Distinguish between the given different types of gears	2.1 Mechanisms- slider crank mechanism, four bar chain mechanism, Inversions of mechanism. 2.2 Belts- types, geometry, V belt selection, timing belt. Chains- Types, geometry, roller chain sprocket, Cams- types of cams, types of followers, follower positions 2.3 Gears: types and applications.
<b>Unit – III Fundamentals of Electrical Circuits</b>	3a. Explain the given electrical quantities and their units. 3b. Inter-relate the given electro-magnetic laws. 3c. Determine power factor in the given series R - L circuit. 3d. Estimate the energy bill for the given A.C. supply circuit.	3.1 Current, voltage, emf, power, energy and its unit 3.2 Kirchhoff's laws: voltage and current, electromagnetic induction, Lenz law, Fleming rules 3.3 Series R-L, R-C circuits and their phasor diagram, types of power, power factor and their improvement method by capacitor 3.4 Energy bill calculation for single

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
		phase and three phase a.c supply
<b>Unit– IV Electrical Devices, Instruments and Lighting System</b>	4a. Describe the working of the given electrical device and its application. 4b. Identify the given types of meters with justification. 4c. Compare types of the given types of lamps in terms of service. 4d. Describe the specified method of energy saving in garment industry.	4.1 Electrical Devices: transformer, servomotors, induction motors and their application 4.2 Analog and digital meters for measuring AC/DC electrical quantities 4.3 Lamps, types of lamps, fluorescent tube, UV lamp, D-65, CFL, LED 4.4 Methods of energy saving in garment industry.
<b>Unit –V Passive components and Semiconductor Devices</b>	5a. Identify the given types of the given active and passive electronic components with justification. 5b. Classify the given types of the given materials in terms of conductors, semiconductors and insulators 5c. Compare the properties of the given types of semiconductors. 5d. Explain characteristics and applications of the given P- N junction diode 5e. Describe the working and applications of the given transistor type	5.1 Active and passive components 5.2 Classification of material - conductors, semiconductors and insulators 5.3 Semiconductor types – intrinsic, extrinsic, P and N type 5.4 P N junction diode – forward and reverse bias characteristics of diode, application – full wave rectifiers 5.5 Transistor – construction, types – PNP and NPN, working, Application – amplifier, transistor as switch
<b>Unit-VI Sensors and Microprocessor in Garment Industry.</b>	6a. Identify the given types of optical sensor with justification. 6b. Identify the given types of displacement sensor with justification. 6c. Identify the given types of temperature sensor with justification. 6d. Identify the given types of pressure sensor with justification. 6e. Identify application of microprocessor in garment manufacturing with justification.	6.1 Optical sensors – LDR, photo diode, phototransistor, LED, opto-couplers 6.2 Displacement sensors – LVDT, capacitive sensor 6.3 Temperature sensors – RTD, thermistor, thermocouples 6.4 Pressure sensors – Bourdon tubes, bellows 6.5 Basic concept of microprocessor, microcontroller and applications in garment manufacturing.

Note: To attain the COs and competency, above listed Learning Outcomes UOs need to be undertaken to achieve the 'Application Level' of Bloom's 'Cognitive Domain Taxonomy'

### 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
<b>Mechanical</b>						
I	Machine and Materials	08	03	01	07	11
II	Mechanisms and Transmission	08	02	03	07	12
<b>Electrical</b>						
I	Fundamentals of Electrical Circuits	08	02	04	06	12
III	Electrical Devices, Instruments and Lighting System	08	02	04	06	12
<b>Electronics</b>						
V	Passive components and Semiconductor Devices	08	03	03	06	12
VI	Sensors and Microprocessor in Garment Industry	08	02	04	05	11
<b>Total</b>		<b>48</b>	<b>14</b>	<b>19</b>	<b>37</b>	<b>70</b>

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

**Note:** This specification table provides general guidelines to assist student for their learning and to teachers to teach and assess students with respect to attainment of UOs. The actual distribution of marks at different taxonomy levels (of R, U and A) in the question paper may vary 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:

- Library survey regarding engineering material used in garment manufacturing machineries.
- Prepare power point presentation or animation for showing different types of transmission drives used.
- Calculate efficiency and output power of transformer and induction motor.
- Give seminar on any relevant topic.
- Library survey regarding machines used in different garment manufacturing industries.
- Prepare power point presentation or animation for showing different types of motors, transformers and lamps.
- Prepare power point presentation or animation for sensors, actuators used in garment manufacturing industries.
- Collect leaflets and specifications of different types of active and passive components used in garment manufacturing industries.

### 11. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES

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

- Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.
- 'L' in item No. 4 does not mean only the traditional lecture method, but different types of teaching methods and media that are to be employed to develop the outcomes.

- About 15-20% of the topics/sub-topics which is relatively simpler or descriptive in nature is to be given to the students for *self-directed learning* and assess the development of the COs through classroom presentations (see implementation guideline for details).
- With respect to item No.10, teachers need to ensure to create opportunities and provisions for *co-curricular activities*.
- Guide student(s) in undertaking micro-projects.

### 12. SUGGESTED MICRO-PROJECTS

*Only one micro-project* is planned to be undertaken by a student assigned to him/her in the beginning of the semester. S/he ought to submit it by the end of the semester to develop the industry oriented COs. Each micro-project should encompass two or more COs which are in fact, an integration of PrOs, UOs and ADOs. The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. 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 total duration of the micro-project should not be less than 16 (sixteen) student engagement hours during the course.

In the first four semesters, the micro-project could be group-based. However, in higher semesters, it should be individually undertaken to build up the skill and confidence in every student to become problem solver so that s/he contributes to the projects of the industry. A suggestive list is given here. Similar micro-projects could be added by the concerned faculty:

- Mechanisms:** Each batch will prepare models for combination of different linkages to form different mechanisms.
- Gear trains:** Each batch will prepare model of gear train useful for apparel machines.
- Energy bill:** Each batch will visit various garment industry/department and estimate their energy bills.
- Electrical transformer:** Each batch will visit, collect and prepare chart to required specifications of transformers used in garment industry.
- Electrical servomotors:** Each batch will collect and prepare chart to required specifications and rating of servomotors used in various garment industry.
- Electrical induction motors:** Each batch will visit, collect and prepare chart to required specifications and rating of induction motors used in various garment industry.
- Electrical lamps and meters:** Each batch will collect and prepare chart to required specifications and rating of different types of lamps and meters used in garment industry.
- Resistor color codes:** Each batch will prepare resistor color code charts. Use the chart to calculate values of different resistors. Collect information of variable resistors, rheostats used in laboratory.
- Semiconductor devices:** Each batch will prepare list of active/passive components, semiconductor devices used in different textile units spinning, weaving, sizing, dyeing, and testing. Collect different active semiconductor devices, list their applications and specifications.
- Transducers:** Each batch will prepare power point presentation or animation displaying different transducers, actuators used in garment industry.
- Sensors:** Each batch will prepare detailed specifications of temperature sensors, pressure sensors, optical sensors, strain gauges used in apparel industry.



1. **Microprocessor:** Each batch will prepare specific information of how microprocessors, microcontrollers used in garment processing and embroidery machines.

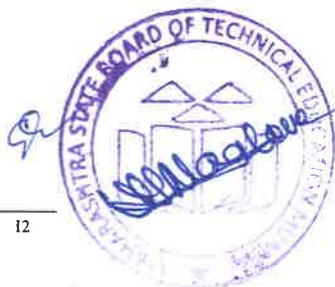
### 13. SUGGESTED LEARNING RESOURCES

S. No.	Title of Book	Author	Publication
1	Textile mechanics vol I	Slatar, K.	The textile institute, Manchester, 1977 ISBN 10: 0900739274
2	Machine and Mechanisms	Myszka, David H.	Pearson education, New York, 2011; ISBN: 978-0-13-215780-3
3	Strength of Materials Elementary and problems	Timoshenko S.	CBS Publishers, New Delhi 2004, ISBN: 9788123910307
4	Theory of machines and Mechanisms	Rattan, S.S.	Tata McGraw-Hill Education, New Delhi, 2009 ISBN: 9780070144774
5	Engineering Mechanics	Bhavikatti, S.S. Rajashakarappa, K.G.	New Age International, New Delhi, 2015, ISBN: 9788122437980
6	A text-book of electrical engineering	Rajput R.K.	Laxmi Publications, New Delhi, 2009 ISBN: 9789380386348
7	Electric Machinery Fundamentals	Chapman, Stephen J.	McGraw-Hill Education, USA, 2010 ISBN: 97800710705222010
8	Electrical Machinery	Bimbhra P.S.	Khanna Publishers, New Delhi, 2014 ISBN: 9788174091734
9	Basic Electrical Engineering	Bakshi U.A. Bakshi V.U.	Technical Publications, New Delhi, 2008 ISBN: 9788184314885
10	Principles of electronics	Mehta, V.K., Mehta, Rohit	S. Chand New Delhi, 2005 ISBN: 9788121924504
11	Basic Electronics (solid state)	Theraja, B. L.	S. Chand New Delhi, 2006 ISBN: 9788121925556
12	Electronics and Electrical Measurements and Instrumentation	Sawhney, A. K.	Dhanpat Rai & Co. New Delhi, 2014 ISBN: 9788177001006
13	8085 microprocessors	Borole Pramod	Lakshmi publishers, New Delhi, 2014 ISBN - 9789382127581
12	Electronic controls in Textile Machines	Joshi, Hiren; Joshi, Gauri.	NCUTE training program, New Delhi, 2003

### 14. SOFTWARE/LEARNING WEBSITES

- <http://www.nptel.ac.in/courses/112102015/22>
- <http://nptel.ac.in/courses/116102012/>
- <http://onlinelibrary.wiley.com/subject/code/000080>
- <http://www.nptel.ac.in/courses/112102015/22>
- <https://en.wikipedia.org/wiki/E-textiles>

- [http://eartheasy.com/live\\_energyeff\\_lighting.htm](http://eartheasy.com/live_energyeff_lighting.htm)
- <http://www.sengpielaudio.com/calculator-ohm.htm>
- <http://freevideolectures.com/Course/2335/Basic-Electrical-Technology>
- <http://www.electrical4u.com/electric-lamp-types-of-electric-lamp/>
- <http://www.electrical4u.com/induction-motor-types-of-induction-motor/>
- <https://www.circuitspecialists.com/blog/differences-between-analog-and-digital-panel-meters/>
- <http://www.electronicandyou.com/blog/active-and-passive-electronic-components.html>
- <https://www.ethz.ch/flexible-electronics>
- <https://learn.sparkfun.com/tutorials/transistors>
- [www.ee.buffalo.edu/faculty/paololiu/566/sensors.ppt](http://www.ee.buffalo.edu/faculty/paololiu/566/sensors.ppt)
- <http://www.zapmeta.com.my/src?q=electronic+sensors&sc=s>
- [www.zapmeta.co.in/Electronic+sensors](http://www.zapmeta.co.in/Electronic+sensors)
- [http://www.electronics-tutorials.ws/io/io\\_3.html](http://www.electronics-tutorials.ws/io/io_3.html)
- <http://www.engineersgarage.com/articles/pressure-sensors-types-working>
- [www.just-style.com/](http://www.just-style.com/)
- [www.fibre2fashion.com](http://www.fibre2fashion.com)
- [www.ibef.org/industry/textiles.aspx](http://www.ibef.org/industry/textiles.aspx)
- [www.makeinindia.com/sector/textiles-and-garments](http://www.makeinindia.com/sector/textiles-and-garments)





**Program Name:** All Branches of Diploma in Engineering and Technology.

**Program Code:** CE/CR/CS/CH/PS/CM/CO/IF/CW/DE/EI/EN/EQ/ET/EX/IE/MU/EE/

EP/EU/IS/IC/AE /FG/ME/PG/PT/DC/TX/TC

**Semester :** Second

**Course Title :** Business Communication Using Computers

**Course Code :** 22009

**1. RATIONALE**

Communication is the key factor for smooth and efficient functioning of any industry or business activity. Effective business communication is the lifeblood of any organization and is required to maintain quality and progress. The efficacy of business communication skills are essential for engineering professionals for instructing, guiding and motivating subordinates to achieve desired goals at work place. It is very crucial for an entrepreneur to run organization successfully by communicating effectively and skillfully with employees, customers and investors. Thus this course has been designed to enhance the skills to *'Communicate effectively and skillfully at workplace.'*

**2. COMPETENCY**

The aim of this course is to help the students to attain the following industry identified competency through various teaching learning experiences

- Communicate effectively and skillfully at workplace.

**3. COURSE OUTCOMES (COs)**

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following *industry oriented* COs associated with the above-mentioned competency:

- Communicate effectively by avoiding barriers in various formal and informal situations.
- Communicate skillfully using non-verbal methods of communication.
- Give presentations by using audio- visual aids.
- Write reports using correct guidelines.
- Compose e-mail and formal business letters.

**4. TEACHING AND EXAMINATION SCHEME**

Teaching Scheme			Credit (L+T+P)	Examination Scheme											
L	T	P		Theory						Practical					
				ESE		PA		Total		ESE		PA		Total	
Paper Hrs.	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
--	--	2	2	--	--	--	--	--	--	35@^	14	15~	06	50	20

(~^): For only practical courses, the PA (15 marks) has two components under practical marks i.e. the assessment of practical has a weightage of 60% (i.e.09 marks) and micro-project assessment has a weightage of 40% (i.e.06 marks). This is designed to facilitate attainment of COs holistically, as there is no theory ESE.

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

**5. COURSE MAP (with sample COs, PrOs, UOs, ADOs and topics)**

This course map illustrates an overview of the flow and linkages of the topics at various levels of outcomes (details in subsequent sections) to be attained by the student by the end of the course, in all domains of learning in terms of the industry/employer identified competency depicted at the centre of this map.

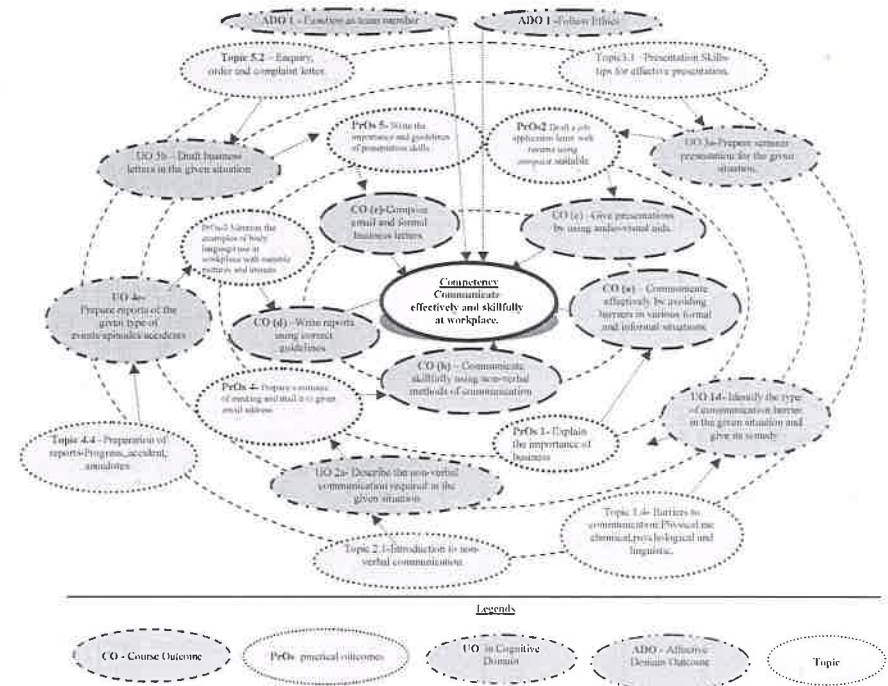
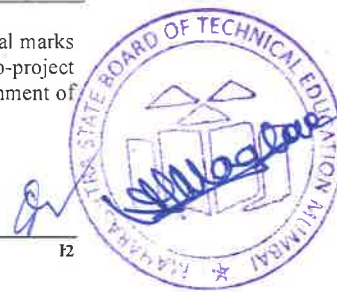


Figure 1 - Course Map

**6. SUGGESTED PRACTICALS ACTIVITIES / EXERCISES (Integrate the theory in the laboratory when conducting practical)**

The practical in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency.

S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. required
1	Explain the importance of business communication for an organization using case study	I	2*





S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. required
2	Draft a job application letter with resume using computer.	V	2*
3	Mention the examples of body language use at workplace with suitable pictures and images.	II	2*
4	Prepare a minutes of meeting and mail it to given email address	VI	2
5	Write the importance and guidelines of presentation skills.	III	2*
6	Draft a detailed Progress Report.	IV	2*
7	Organize a debate on types of communication.	I & III	2
8	Summarize an industry report using techniques of summarizing.	IV	2
9	Draft a complaint letter on given topic.	V	2
10	Design PowerPoint presentation on any technical topic.	III	2*
11	Explain the eight principles of effective communication.	I	2*
12	Explain various non-verbal codes with examples.	II	2
13	Explain the importance of personal appearance stating tips of grooming for a professional.	II	2*
14	Draft a memo on given topic.	V	2
15	Present any Two barriers to communication using case study.	I	2*
16	Present a technical paper using IEEE format	III	2*
			32

**Note**

- i. A suggestive list of practical LOs is given in the above table, more such practical LOs can be added to attain the COs and competency. A judicious mix of minimum 12 or more practical LOs/tutorials need to be performed, out of which, the practicals marked as '\*' are compulsory, so that the student reaches the 'Precision Level' of Dave's 'Psychomotor Domain Taxonomy' as generally required by the industry. The size of batch for the practical should not exceed more than 21 students strictly for the maximum attainment of COs and PrOs.
- ii. Hence, the 'Process' and 'Product' related skills associated with each LO of the laboratory/workshop/field work are to be assessed according to a suggested sample given below:

**7. MAJOR EQUIPMENTS / INSTRUMENTS REQUIRED**

The major equipment with broad specification mentioned here will usher in uniformity in conduct of experiments, as well as aid to procure equipment by authorities concerned.

S. No.	Equipment Name with Broad Specifications	Exp. S.No.
1	LCD Projector	All
2	Smart Board with networking	All
3	Language lab with internet	All
4	Printer	Wherever Applicable

**8. UNDERPINNING THEORY COMPONENTS**

The following topics/subtopics should be taught and assessed in order to develop UOs in cognitive domain for achieving the COs to attain the identified competency:

Unit	Unit Outcomes (UOs) (in cognitive domain)		Topics and Sub-topics
	Writing Skills	Speaking Skills	
<b>Unit – I Introduction to Business Communication</b>	1a. Describe the importance of the business communication in the given situation. 1b. Identify the missing element in the given communication process. 1c. Identify the type of communication in the given situation. 1d. Identify the type of communication barrier in the given situation and its remedy.	1e. Use different types of verbal and non-verbal communication for the given situation.	1.1 Introduction to Communication- Elements, Importance, Functions. 1.2 Types (meaning and importance) – Verbal (Oral-Written), Formal, Informal, Vertical, Horizontal and Diagonal communication. 1.3 Principles of effective communication. 1.4 Barriers to communication - Physical, mechanical, psychological and linguistic. 1.5 Business communication: Meaning, characteristics and importance.
<b>Unit– II Non-Verbal Communication</b>	2a. Describe the non-verbal communication required in the given situation. 2b. Describe personal appearance required in the given communication situation. 2c. Describe the given facial expressions.	2d. Use relevant facial expressions in the given situation. 2e. Answer questions after listening to presentations.	2.1 Introduction to Non-Verbal communication (Meaning and importance) 2.2 Body Language: Aspects of body language: gestures, eye contact, posture, facial expressions, personal appearance (dressing and grooming) vocalics. 2.3 Body language - positive and negative body language.
<b>Unit– III Presentation skills</b>	3a. Prepare seminar presentation for the given situation. 3b. Prepare debate points 'for' and 'against' the given topic. 3c. Prepare the points for computer presentation	3d. Make seminar presentation 3e. Participate in debate speaking 'for' or 'against' the given topic. 3f. Make effective	3.1 Presentation skills- tips for effective presentation. 3.2 Guidelines for developing power point presentation. 3.3 Presenting Technical papers.

Unit	Unit Outcomes (UOs) (in cognitive domain)		Topics and Sub-topics
	Writing Skills	Speaking Skills	
	for the given topic.	computer presentations	
<b>Unit- IV Office Drafting</b>	4a. Draft the given notice using the relevant format. 4b. Draft the given memorandum using the relevant format. 4c. Prepare agenda for the given type of meetings. 4d. Prepare minutes of the given type of meetings. 4e. Prepare reports of the given type of events/episodes/accidents	4f. Read the agenda of the given meeting. 4g. Read the report of the given event. 4h. Initiate telephone calls for given situation. 4i. Answer official phone calls for given situation.	4.1. Office drafting: Formats and Guidelines. 4.2. Formulating notices and memoranda. 4.3. Preparation of agenda and writing minutes of meetings. 4.4. Preparation of reports-progress reports, Accident reports, case study. 4.5. Summarizing techniques.
<b>Unit-V Business Correspondence</b>	5a. Respond to given job advertisements by writing your CV/ Resume. 5b. Draft business letters in the given situations. 5c. Draft complaint letters for the given situations. 5d. Compose E- mails with relevant for the given situation.		5.1 Business correspondence. 5.2 Enquiry, order and complaint letters. 5.3 E-mails- netiquettes, 5.4 Difference –Curriculum Vitae, Bio-data and Resume. 5.5 Job application and resume writing

*Note: To attain the COs and competency, above listed Learning Outcomes (UOs) need to be undertaken to achieve the 'Application Level' of Blooms's 'Cognitive Domain Taxonomy' Theory related topic should be covered during practical hours using multimedia.*

#### 9. SUGGESTED SPECIFICATION TABLE FOR INTERNAL END SEMESTER EXAMINATION

Unit No.	Unit Title	Distribution of practical Marks			
		R Level	U Level	A Level	Total Marks
I	Introduction to Business Communication	02	02	01	05
II	Non-verbal Communication	02	01	02	05
III	Presentation Skills	02	01	02	05
IV	Office Drafting	02	04	04	10
V	Business Correspondence	02	04	04	10
<b>Total</b>		<b>10</b>	<b>12</b>	<b>13</b>	<b>35</b>

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

*Note: This specification table provides general guidelines to assist student for their learning and to teachers to teach and assess students with respect to attainment of PrOs and UOs. The actual distribution of marks at different taxonomy levels (of R, U and A) in the question paper may vary from above table.*

#### 10. SUGGESTED GUIDELINES FOR ASSESSMENT TOOL TO CONDUCT INTERNAL END SEMESTER EXAM (ESE) .

Weightage (20 Marks)	Weightage (15 Marks)	Total
<b>A</b>	<b>B</b>	
<b>Assessment based on PrOs, practicals conducted during semester</b> <b>Based on computer and written skill.</b> <b>(Minimum four questions each five marks)</b> <b>Sample questions:</b> <b>Eg. I Draft an email to The manager regarding the shortage of raw material at production department.</b> <b>Note-submit the printout of mail. (Computer based)</b> <b>Eg. II Write job application with resume. ( written )</b>	<b>Oral examination based on UOs</b> <b>Topics mentioned in syllabus.</b> <b>(Minimum five questions each two marks to be asked )</b> <b>Eg. I Explain the importance of communication in professional life.</b> <b>II. State any four guidelines of presentation skills.</b>	<b>(35 Marks)</b> <b>A+B</b> <b>Duration: 2 hours</b>

#### SUGGESTED STUDENT ACTIVITIES

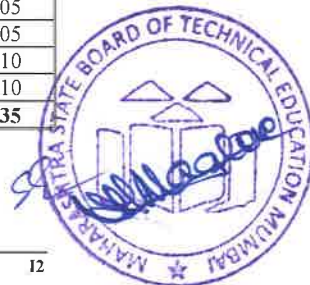
Other than the classroom and laboratory learning, following are the suggested student-related *co-curricular* activities which can be undertaken to accelerate the attainment of the various outcomes in this course:

- Collect good articles from newspapers and magazines and read them with correct intonation.
- Listen to Business news on TV and radio.
- Watch videos of effective presentations on television and open learning sources for presentation skills and body language.
- Undertake micro-projects.

#### 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:

- Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.



- b. 'L' in item No. 4 does not mean only the traditional lecture method, but different types of teaching methods and media that are to be employed to develop the outcomes.
- c. About 15-20% of the topics/sub-topics which is relatively simpler or descriptive in nature is to be given to the students for *self-directed learning* and assess the development of the COs through classroom presentations (see implementation guideline for details).
- d. With respect to item No.10, teachers need to ensure to create opportunities and provisions for *co-curricular activities*.
- Arrange various communication activities using functional grammar.
  - Show video/animation films to develop listening skills and enhance vocabulary.
  - Use real life situations for explanation.
  - Prepare and give oral presentations.
  - Guide micro-projects in groups as well as individually.

### 12. SUGGESTED TITLES OF 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. S/he ought to submit it by the end of the semester to develop the industry oriented COs. Each micro-project should encompass two or more COs which are in fact, an integration of CrAs, UOs and ADOs. The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. 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 total duration of the micro-project should not be less than 16 (*sixteen*) *student engagement* hours during the course.

In the first four semesters, the micro-project could be group-based. However, in higher semesters, it should be individually undertaken to build up the skill and confidence in every student to become problem solver so that s/he contributes to the projects of the industry. A suggestive list is given here. Similar micro-projects could be added by the concerned faculty:

- Study the personal appearance and grooming of employees visiting sales store, shopping mall in the vicinity.
- Comparative study of Bio-data, Resume and Curriculum vitae.
- A detailed study of guidelines required for presentation skills.
- Summarize technical content using English newspaper, magazines or online resources.
- Prepare a booklet on aspects of body language in pictorial form.
- A detailed study of the importance, of technical paper of technical paper presentation.
- Case study on the importance of Business communication in an organization.
- Report on various formal/business activities.
- Study of oral presentation of famous business leader.
- Detailed study of business etiquettes observed in organization.
- Summarize the business article with the help of English newspapers/magazines and other sources.

### 13. SUGGESTED LEARNING RESOURCES

S. No.	Title of Book	Author	Publication
1	Effective Communication Skills	M Ashraf Rizvi	Tata McGraw-Hill

S. No.	Title of Book	Author	Publication
2	Communication Skills	Sanjay Kumar and Pushp Lata	Oxford University Press
3	Personality Development and Soft Skills	Barun K. Mitra	Oxford University Press

### 14. SOFTWARE/LEARNING WEBSITES

- <https://www.britishcouncil.in/english/learn-online>
- <http://learnenglish.britishcouncil.org/en/content>
- <http://www.talkenglish.com/>
- [languageabssystem.com](http://languageabssystem.com)
- [www.wordsworthelt.com](http://www.wordsworthelt.com)
- [www.notesdesk.com](http://www.notesdesk.com)
- <http://www.tutorialspoint.com>
- [www.studylecturenotes.com](http://www.studylecturenotes.com)
- [totalcommunicator.com](http://totalcommunicator.com)
- [www.speaking-tips.com](http://www.speaking-tips.com)





S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
3	Prepare sample of various hand stitches – Chain stitch, Blanket stitch, Herring bone, Over casting.	II	02
4	Develop design for Kantha Embroidery of West Bengal using traditional motifs, Colors and Materials.	III	02
5	Develop design for Katchi Embroidery of Gujrat using traditional motifs, Colors and Materials.	III	02
6	Develop design for Rabari Embroidery of Rajasthan using traditional motifs, Colors and Materials.	III	02
7	Develop design for Kashida Embroidery of Kashmir using traditional motifs, Colors and Materials.	IV	02
8	Develop design for Phulkari Embroidery of Punjab using traditional motifs, Colors and Materials.	IV	02
9	Develop design for Chikankari Embroidery of Uttar Pradesh using traditional motifs, Colors and Materials.	IV	02
10	Develop design for Kasuti Embroidery of Karnataka using traditional motifs, Colors and Materials.	IV	02
11	Use computerized embroidery machines with appropriate needle, thread and fabric.	V	02
12	Create basic design elements with computerized embroidery machine software.	V	02
13	Develop the design in computerized embroidery machines- alphabetical design.	V	02
14	Develop the design in computerized embroidery machines-creative design.	V	02
15	Develop one embroidered sample using Bead work.	VI	02
16	Develop one embroidered sample using Sequins work	VI	02
<b>Total</b>			<b>32</b>

**Note**

- i. A suggestive list of PrOs is given in the above table. More such PrOs can be added to attain the COs and competency. A judicious mix of minimum 24 or more practicals need to be performed, out of which, the practicals marked as '\*' are compulsory, so that the student reaches the 'Precision Level' of Dave's 'Psychomotor Domain Taxonomy' as generally required by the industry.
- ii. The 'Process' and 'Product' related skills associated with each PrO is to be assessed according to a suggested sample given below:

S. No.	Performance Indicators	Weightage in %
1.	Selection of motif.	10
2.	Selection of color scheme.	20
3.	Selection of needle, threads and fabric.	20
4.	Safety measures.	10
5.	Presentation of output.	30
6.	Answer to sample questions.	10
<b>Total</b>		<b>100</b>



The above PrOs also comprise of the following social skills/attitudes which are Affective Domain Outcomes (ADOs) that are best developed through the laboratory/field based experiences

- Follow safety practices.
- Practice good housekeeping.
- Demonstrate working as a leader/a team member.
- Maintain tools and equipment.
- Follow ethical practices.

The ADOs are not specific to any one PrO, but are embedded in many PrOs. Hence, the acquisition of the ADOs takes place gradually in the student when s/he undertakes a series of practical experiences over a period of time. Moreover, the level of achievement of the ADOs according to Krathwohl's 'Affective Domain Taxonomy' should gradually increase as planned below:

- 'Valuing Level' in 1<sup>st</sup> year
- 'Organising Level' in 2<sup>nd</sup> year
- 'Characterising Level' in 3<sup>rd</sup> year.

**7. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED**

The major equipment with broad specification mentioned here will usher in uniformity in conduct of experiments, as well as aid to procure equipment by authorities concerned.

S. No.	Equipment Name with Broad Specifications	Exp. S. No.
1	Hand Embroidery needles size 9-11, Machine Embroidery Needle- Size 9-11.	1 to 16
2	Embroidery threads of different material like silk, cotton, Art silk.	1 to 16
3	Cotton, Silk, Khadi, Muslin fabric.	1 to 15
4	Embroidery ring – 9"	1 to 10
5	Tracing paper -Gate way, Carbon paper, Glass table	1 to 15
6	Industrial computerized embroidery machine -2 head, 18 needle	11 to 15
7	Software such as Wilcom s-65, latest version	11 to 15

**8. UNDERPINNING THEORY COMPONENTS**

The following topics/subtopics should be taught and assessed in viva voce order to develop UOs for achieving the COs to attain the identified competency.

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>Unit - I Embroidery Tools and Equipment</b>	<p>1a. Select the relevant needle, fabric, Thread according to given embroidery type with justification.</p> <p>1b. Select the relevant frame, tracing paper and glass table according to given embroidery type with justification.</p> <p>1c. Select relevant design for the heat transfer technique for the given work with justification.</p>	<p>1.1. Embroidery needles, threads, frames, tracing paper, Glass table, applications.</p> <p>1.2. Direct tracing, heat transfer, water soluble paper, applications</p>

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
	1d. Select relevant water soluble paper for the given work with justification.	
<b>Unit - II Stitches in Embroidery</b>	2a. Identify the specified basic hand embroidery stitches. 2b. Select the stitch for the given type of stitch with justification. 2c. Differentiate between the given type of stitches. 2d. Select the type of stitch to be adopted for the given Motif with justification.	2.1 Basic embroidery stitches- Running Stitch, Back Stitch, stem stitch, chain stitch, Blanket stitch, Satin Stitch, over-casting, basting, Herring-bone 2.2 Types of stitches 2.3 Effectiveness and application of above stitch
<b>Unit - III Traditional Embroidery of Eastern and Western India</b>	3a. Identify the embroideries of Eastern India. 3b. Identify the embroideries of Western India. 3c. Differentiate the salient features between Kantha, Katchi and Rabari Embroidery. 3d. Select the most relevant motif, color scheme and materials for the given region.	3.1. <b>West Bengal- Kantha embroidery-</b> Traditional Motifs using appropriate colors, stitches and material 3.2. <b>Gujarat-Katchi Bharat; Rajasthan- Rabari Embroidery-</b> Traditional Motifs using appropriate colors, stitches and material, 3.3. Salient features of above 3.4. Using appropriate colors, stitches and material.
<b>Unit - IV Traditional Embroidery of Northern and Southern India</b>	4a. Identify the embroideries of Northern India. 4b. Identify the embroideries of Southern India. 4c. Differentiate the specified features of Kashida, Phulkari, Chikankari, and Kasuti Embroidery. 4d. Select the most relevant motif, color scheme and materials for the given region.	4.1 <b>Kashmir- Kashida embroidery, Punjab- Phulkari Embroidery</b> Traditional Motifs using appropriate colors, stitches and material. <b>Uttar Pradesh Chikankari embroidery,</b> 4.2 <b>Karnataka- Kasuti embroidery</b> -Traditional Motifs using appropriate colors, stitches and material 4.3 Comparison of salient features 4.4 Using appropriate colors, stitches and material in Motifs
<b>Unit - V Computerized Machine Embroidery</b>	5a. Identify specified parts of the given computerized embroidery machine 5b. Describe the operation procedure of the given type machine 5c. Plan specified alphabetical design in the computerized embroidery machines 5d. Plan creative design for the given	5.1. Parts in computerized embroidery machine - Frame, heads, needle 5.2. Threading of machine and operation procedure 5.3. Alphabetical Design development on computerized machine

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
	computerized embroidery machines	5.4. creative design development on computerized embroidery machine
<b>Unit - VI Surface Ornamentation Techniques</b>	6a. Identify the use of given ornamentation techniques 6b. Differentiate the given types of ornamentation works. 6c. Describe the salient features of the given work 6d. Select the type of surface ornamentation for the given type of fabric with justification.	6.1. Motifs, Fabric, threads, beads, sequins, needles used for various ornamentation techniques. 6.2. Material and salient features of Eyelet work, Lace work, Cut work, Patch work, Applique work, Bead and sequins work

*Note: To attain the COs and competency, above listed UOs need to be undertaken to achieve the 'Application Level' of Bloom's 'Cognitive Domain Taxonomy'*

#### 9. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN - Not Applicable -

#### 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:

- Catalogue/ Display piece of state wise traditional embroidery work:** Prepare catalogue/ display piece like table cloth, pillow cover, kurti cloth, handkerchiefs of ten samples of one state. Specify the base cloth, thread material and other accessories.
- Photo album:** one north Indian one south Indian and one northeastern state embroidery work. Actual development of two samples from each state.

#### 11. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES

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

- Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.
- '*L*' in item No. 4 does not mean only the traditional lecture method, but different types of teaching methods and media that are to be employed to develop the outcomes.
- About *15-20% of the topics/sub-topics* which is relatively simpler or descriptive in nature is to be given to the students for *self-directed learning* and assess the development of the COs through classroom presentations (see implementation guideline for details).
- With respect to item No.10, teachers need to ensure to create opportunities and provisions for *co-curricular activities*.
- Guide student(s) in undertaking micro-projects.

#### 12. SUGGESTED MICRO-PROJECTS

*Only one micro-project* is planned to be undertaken by a student assigned to him/her in the beginning of the semester. S/he ought to submit it by the end of the semester to develop the industry oriented COs. Each micro-project should encompass two or more COs which are in



fact, an integration of PrOs, UOs and ADOs. The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. 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 total duration of the micro-project should not be less than **16 (sixteen) student engagement hours** during the course.

In the first four semesters, the micro-project could be group-based. However, in higher semesters, it should be individually undertaken to build up the skill and confidence in every student to become problem solver so that s/he contributes to the projects of the industry. A suggestive list to be given to groups of 3 to 4 students is given here. Similar micro-projects could be added by the concerned faculty:

- a. **Catalog Collection:** Collect catalogues of different embroidery and stitching machines and prepare a technical comparison chart of at least three different machines.
- b. **Dress Material Development:** Develop dress material for men/ women using any two types of motifs.

### 13. SUGGESTED LEARNING RESOURCES

S.No.	Title of Book	Author	Publication
1	Embroidered textiles	Paine Shaila	Thames and Hudson Ltd. Delhi. ISBN:9780500513941
2	Inspirational ideas for embroideries of India	Lawther Gail	Search Press Ltd. ISBN: NA
3	Traditional embroideries of India	Naik Shailaja D.	APH publishing corporation New Delhi. ISBN: 9788170247319

### 14. SOFTWARE/LEARNING WEBSITES

- a. [www.fiber2fashion.com](http://www.fiber2fashion.com)
- b. [www.google.com](http://www.google.com)
- c. [www.youtube.com](http://www.youtube.com)
- d. [www.pinterest.com](http://www.pinterest.com)



**Program Name** : Diploma in Fashion and Clothing Technology  
**Program Code** : DC  
**Semester** : Second  
**Course Title** : Fundamentals of Fashion Illustration  
**Course Code** : 22016

**1. RATIONALE**

Fashion illustration is the first step of garment production process. It is essential for students to sketch figures with proper parameters. Size, shape, form are pre-requisites for any creation in fashion illustration students will understand imagination, visualization, representation of ideas based on various principles from fashion world.

**2. COMPETENCY**

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

- Render human figures for garment designing.

**3. COURSE OUTCOMES (COs)**

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

- Select the required tools and materials for different drawings and sketching.
- Draw fashion figures for men, women and kids.
- Prepare relevant drawing using different elements of design.
- Draw different motifs, patterns and textures.
- Draw different types of darts, pleats and ruffles using principles of design.

**4. TEACHING AND EXAMINATION SCHEME**

Teaching Scheme			Credit (L+T+P)	Examination Scheme											
L	T	P		Theory						Practical					
				ESE		PA		Total		ESE		PA		Total	
Paper Hrs.		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min		
-	-	4	4	--	--	--	--	50@	20	50~	20	100	40		

(~<sup>2</sup>): For the practical only courses, the PA has two components under practical marks i.e. the assessment of practicals (seen in section 6) has a weightage of 60% (i.e.15 marks) and micro-project assessment (seen in section 12) has a weightage of 40% (i.e.10 marks). This is designed to facilitate attainment of COs holistically, as there is no theory ESE.

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

**5. COURSE MAP (with sample COs, PrOs, UOs, ADOs and topics)**

This course map illustrates an overview of the flow and linkages of the topics at various levels of outcomes (details in subsequent sections) to be attained by the student by the end of the course, in all domains of learning in terms of the industry/employer identified competency depicted at the centre of this map.

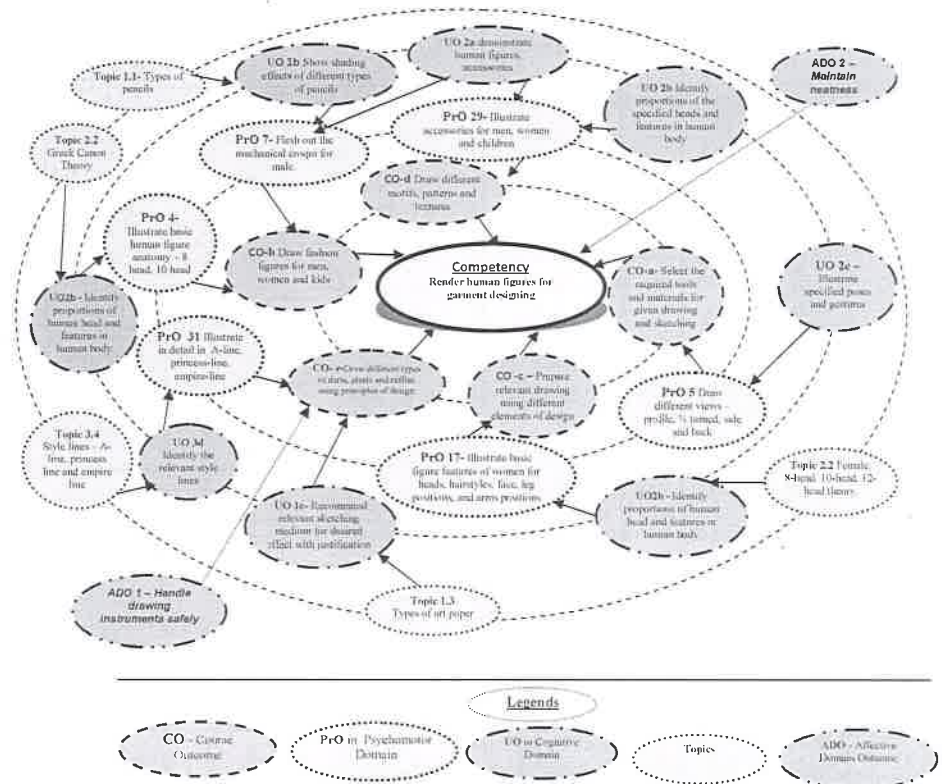


Figure 1 - Course Map

**6. SUGGESTED PRACTICALS/ EXERCISES**

The practicals in this section are PrOs (i.e. sub-components of the COs) to be developed and assessed in the student for the attainment of the competency.

S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
1.	Utilize the materials used in fashion illustration – carbon pencils(6 H to 12 B), charcoal, china graph pencil, micro tip pencil, staedtler pencil, poster and pastel, fabric paints to draw basic sketches. (Part-I)	I	02*
2.	Utilize the materials used in fashion illustration – carbon pencils(6 H to 12 B), charcoal, china graph pencil, micro tip pencil, staedtler pencil, poster and pastel, fabric paints to draw basic sketches. (Part-II)	I	02
3.	Illustrate basic human figure anatomy – 8 head, 10 head and 12 head (Part-I)	II	02*





S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
4.	Illustrate basic human figure anatomy – 8 head, 10 head and 12 head (Part-II)	II	02
5.	Draw different views – profile, ¾ turned, side and back view(Part-I)	II	02
6.	Draw different views – profile, ¾ turned, side and back view(Part-II)	II	02
7.	Flesh out the mechanical croqui for male.	II	02
8.	Flesh out the mechanical croqui for female.	II	02
9.	Illustrate the head theory for women – 8, 10, 12 (Part-I)	II	02
10.	Illustrate the head theory for women – 8, 10, 12 (Part-II)	II	02
11.	Illustrate the head theory for men – 8, 10, 12 (Part -I)	II	02
12.	Illustrate the head theory for men – 8, 10, 12 (Part -II)	II	02
13.	Illustrate the head theory for kids – 2, 4, 6 (Part-I)	II	02
14.	Illustrate the head theory for kids – 2, 4, 6 (Part-II)	II	02
15.	Modify the figure – enlargement and reduction of front 10 head (Part-I)	II	02
16.	Modify the figure – enlargement and reduction of front 10 head (Part-II)	II	02
17.	Illustrate in detail basic figure features of women for heads, hairstyles, face, leg positions, and arms positions. ( Part-I)	III	02*
18.	Illustrate in detail basic figure features of women for heads, hairstyles, face, leg positions, and arms positions ( Part-II)	III	02
19.	Illustrate in detail basic figure features of men for heads, hairstyles, face, leg positions, and arms positions (Part-I)	III	02
20.	Illustrate in detail basic figure features of men for heads, hairstyles, face, leg positions, and arms positions (Part-II)	III	02
21.	Illustrate in detail basic figure features of kids for heads, hairstyles, face, leg positions, and arms positions.(Part-I)	III	02
22.	Illustrate in detail basic figure features of kids for heads, hairstyles, face, leg positions, and arms positions.(Part-II)	III	02
23.	Illustrate in detail the difference between specified male and female figure.(Part-I)	III	02*
24.	Illustrate in detail the difference between specified male and female figure (part-II)	III	02
25.	Illustrate in detail the overlapping figures – front, back, and profile.(Part-I)	III	02
26.	Illustrate in detail the overlapping figures – front, back, and profile (Part-II)	III	02
27.	Draw different poses for weight distribution. (Part-I)	III	02*
28.	Draw different poses for weight distribution. (Part-II)	III	02
29.	Illustrate in detail the accessories for men, women and children (Part-I)	III	02
30.	Illustrate in detail the accessories for men, women and children (Part-II)	III	02
31.	Illustrate in detail the different style-lines such as A-line,	III	02

S. No.	Practical Outcomes (PrOs)	Unit No.	Approx. Hrs. Required
	princess-line, empire-line(Part-I)		
32.	Illustrate in detail the different style-lines such as A-line, princess-line, empire-line (Part-II)	III	02
<b>Total</b>			<b>64</b>

**Note**

- i. A suggestive list of PrOs is given in the above table. More such PrOs can be added to attain the COs and competency. A judicious mix of minimum 12 or more practical need to be performed, out of which, the practicals marked as '\*' are compulsory, so that the student reaches the 'Precision Level' of Dave's 'Psychomotor Domain Taxonomy' as generally required by the industry.
- ii. The 'Process' and 'Product' related skills associated with each PrO is to be assessed according to a suggested sample given below:

S. No.	Performance Indicators	Weightage in %
1.	Selecting proper material	20
2.	Operate skillfully	30
3.	Selecting proper colour harmonies	10
4.	Drawing proportionate figures	20
5.	Presentation of output	10
6.	Submit report timely	10
<b>Total</b>		<b>100</b>

The above PrOs also comprise of the following social skills/attitudes which are Affective Domain Outcomes (ADOs) that are best developed through the laboratory/field based experiences:

- Follow safety practices.
- Practice good housekeeping.
- Demonstrate working as a leader/a team member.
- Maintain tools and equipment.
- Follow ethical practices.

The ADOs are not specific to any one PrO, but are embedded in many PrOs. Hence, the acquisition of the ADOs takes place gradually in the student when s/he undertakes a series of practical experiences over a period of time. Moreover, the level of achievement of the ADOs according to Krathwohl's 'Affective Domain Taxonomy' should gradually increase as planned below

- 'Valuing Level' in 1<sup>st</sup> year
- 'Organising Level' in 2<sup>nd</sup> year
- 'Characterising Level' in 3<sup>rd</sup> year.

**7. MAJOR EQUIPMENT/ INSTRUMENTS REQUIRED**

The major equipment with broad specification mentioned here will usher in uniformity in conduct of experiments, as well as aid to procure equipment by authorities concerned.



S. No.	Equipment/Instruments/Other resources name with Broad Specifications	Experiment S.No.
1	Drawing Table with Drawing Board of Full Imperial/ A1 size.	All I to 16
2	Stationary material- Drawing Sheet	All I to 16
3	Colouring material- Poster Colour, Colour Pencil	All I to 16

### 8. UNDERPINNING THEORY COMPONENTS

The following topics/ subtopics are to be taught and assessed in order to develop UOs for achieving the COs to attain the identified competency:

Unit	Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
<b>Unit – I Sketching Tools</b>	1a. Describe the need for the specified type of pencils. 1b. Describe the criteria/procedure to apply the given type of colours and inks 1c. Recommend relevant sketching medium for desired effect with justification. 1d. Select relevant tools for fashion illustration.	1.1. Types of pencil 1.2. Types of colour, pen and ink 1.3. Types of art paper 1.4. Selection criteria for different sketching tools and raw materials
<b>Unit – II Human Anatomy</b>	2a. Illustrate the given type of human figures and accessories 2b. Identify proportions of the specified heads and features in human body 2c. Illustrate the specified poses and gestures 2d. Illustrate the specified head theories	2.1. Introduction to human figure anatomy 2.2. History of Greek Canon theory 2.3. Steps in free hand sketching and gestures sketching. 2.4. Male: 8-head, 10-head, 12head theory. 2.5. Female: 8-head, 10-head, 12-head theory. 2.6. Kid: 2-head, 4-head, 6-head theory.
<b>Unit – III Modifying the Figure</b>	3a. Describe the method for enlargement and reduction of fashion figures. 3b. Explain the method for overlapping fashion figures. 3c. Illustrate different poses for weight distribution. 3d. Identify the relevant style lines.	3.1. Enlargement and reduction of male figures, female figures, kid's figures. 3.2. Method of overlapping the figures. 3.3. Different poses for weight distribution. 3.4. Style lines – A-line, princess line and empire line.

*Note: To attain the COs and competency, above listed UOs need to be undertaken to achieve the 'Application Level' of Bloom's 'Cognitive Domain Taxonomy'.*

### 9. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN - Not applicable -

### 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:

- Organizing exhibitions.
- Organizing competitions.
- Organizing Community based events.

### 11. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES

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

- Guide student(s) in using the sheet and material on drawing board.
- Show video films to explain different sketching techniques.
- Demonstrate different colour harmonies.
- Massive open online courses (*MOOCs*) may be used to teach various topics/sub topics.
- 'L' in item No. 4 does not mean only the traditional lecture method, but different types of teaching methods and media that are to be employed to develop the outcomes.
- About *15-20% of the topics/sub-topics* which is relatively simpler or descriptive in nature is to be given to the students for *self-directed learning* and assess the development of the COs through classroom presentations (see implementation guideline for details).
- With respect to item No.10, teachers need to ensure to create opportunities and provisions for *co-curricular activities*.
- Guide student(s) in undertaking micro-projects.

### 12. SUGGESTED LIST OF MICRO PROJECTS

*Only one micro-project* is planned to be undertaken by a student assigned to him/her in the beginning of the semester. S/he ought to submit it by the end of the semester to develop the industry oriented COs. Each micro-project should encompass two or more COs which are in fact, an integration of PrOs, UOs and ADOs. The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. 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 total duration of the micro-project should not be less than *16 (sixteen) student engagement hours* during the course.

In the first four semesters, the micro-project could be group-based. However, in higher semesters, it should be individually undertaken to build up the skill and confidence in every student to become problem solver so that s/he contributes to the projects of the industry. A suggestive list to be given to groups of 3 to 4 students is given here. Similar micro-projects could be added by the concerned faculty:

- Illustrations:** Illustrate 20 hairstyles for bride.
- Scrap book making:** each student of the batch will collect the cut outs and identify the silhouette and prepare the scrap book.
- Illustration of various poses:** illustrate 50 poses for leg and arm positions each.

### 13. SUGGESTED LEARNING RESOURCES



S. No.	Title of Book	Author	Publication
1	Fashion Sketch Book	Abling Bina	Om Books International (2004) ISBN: 9781609012281
2	Illustrating Fashion	Kathryn Mc Kelvey and Munslow Jamine	Black Well Publishing House (2004)ISBN: 978-1-4051-3952-6
3	Encyclopedia of Fashion Details	Ireland Patrick John	B.T Batsford and Om Publishers (2005)ISBN:9780713464337
4	Fashion Design Illustration- Children	Ireland Patrick John	Om Books International (1995) ISBN: 9780713466249
5	Fashion Illustration andRendering	Bhargav Ritu	Jain Publishers (2005) ISBN:9788180565274

#### 14. SOFTWARE/LEARNING WEBSITES

- a. [www.threadsmagazine.com/item/40563/essentials-for-a-fashion-sketching-tool-kit/page/all](http://www.threadsmagazine.com/item/40563/essentials-for-a-fashion-sketching-tool-kit/page/all)
- b. [www.fsketcher.com/equipment/](http://www.fsketcher.com/equipment/)
- c. [www.idrawfashion.com/blog/drawing-process/138-my-fashion-sketches-coloring-technique/www.pinterest.com](http://www.idrawfashion.com/blog/drawing-process/138-my-fashion-sketches-coloring-technique/www.pinterest.com)
- d. [www.design.tutspus.com/articles/human-anatomy-fundamentals-basic-body-proportions--vector-18254](http://www.design.tutspus.com/articles/human-anatomy-fundamentals-basic-body-proportions--vector-18254)
- e. [www.design.tutspus.com/articles/10-top-tips-for-fashion-illustration--cms-25881](http://www.design.tutspus.com/articles/10-top-tips-for-fashion-illustration--cms-25881)
- f. [www.ecoursesonline.iasri.res.in/mod/page/view.php?id=114171](http://www.ecoursesonline.iasri.res.in/mod/page/view.php?id=114171)
- g. [www.abduzeedo.com/55-inspiring-fashion-sketches-illustrations](http://www.abduzeedo.com/55-inspiring-fashion-sketches-illustrations)
- h. [www.youtube.com/watch?v=u\\_4HG0LAV2o](http://www.youtube.com/watch?v=u_4HG0LAV2o)
- i. [www.youtube.com/watch?v=2nNDUDmK4wE](http://www.youtube.com/watch?v=2nNDUDmK4wE)
- j. [https://books.google.co.in/books?id=to3v\\_S5JuPMCandpg=PA7andlpg=PA7anddq=fashion+illustration+posesandsource=blandots=oEMA9E2HFPandsig=jyJW1tg6Jazt4rjwman999OYvLMandhl=enandsa=Xandved=0ahUKEwiV9tubhd3SAhUIF5QKHc0-BX8Q6AEIwJA0#v=onepageandq=fashion%20illustration%20posesandf=false](https://books.google.co.in/books?id=to3v_S5JuPMCandpg=PA7andlpg=PA7anddq=fashion+illustration+posesandsource=blandots=oEMA9E2HFPandsig=jyJW1tg6Jazt4rjwman999OYvLMandhl=enandsa=Xandved=0ahUKEwiV9tubhd3SAhUIF5QKHc0-BX8Q6AEIwJA0#v=onepageandq=fashion%20illustration%20posesandf=false)

