Government Polytechnic, Pune

'180 OB'– Scheme

Programme	Diplôma in ET/CE/EE//ME/MT/CM/IT/**DDGM**
Programme code	01/02/03/04/05/06/07/**08**/16/17/21/22/23/24/26
Name of Course	**Textile Science- I**
Course Code	**DD 2101**
Prerequisite course code and name	--

1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)		Examination Scheme				
					Theory		Practical		Total Marks
L	T	P	C		ESE	PA	*ESE	PA	
04	00	00	04	Marks	80	20	-	-	100
				Exam Duration	3 Hrs	1 Hr	-	-	

(*): *OE/POE (Oral Examination/Practical&Oral Examination mention whichever is applicable)*

Legends: L- lecture-Tutorial/teacher guided theory practice, P-practical, ESE-End semester examination, PA- Progressive Assessment.

2. RATIONALE

This course is to understand the basic textile related terminologies and selecting appropriate textile fiber after studying its process and implement the knowledge of appropriate fabric to design dress.

3. COMPETENCY

The aim of this course is to attend following industry identified competency through various teaching learning experiences:

- **Select appropriate fabric to design the dress.**

4. 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**:**

CO1: Use appropriate terminologies of textile.
CO2: Select appropriate fiber according to need.
CO3: Use appropriate fabric to garment manufacturing
CO4: Differentiate natural fibers and manmade fibers.
CO5: Identify the types of yarns

5. THEORY COMPONENTS

The following topics/subtopicsshould betaught and assessed in order to develop UOs for achieving the Cos to attain the identified competency**.**

Unit Outcomes (Uos) (in cognitive domain)	**Topics and Sub-topics**
UNIT 1. TERMINOLOGY OF TEXTILES (Weightage-16Marks , Hrs- 12)	
1a.Define warp and weft yarns. 1b.Enlist the types of yarns. 1c.Define knitting 1d.Define bonding 1e. Define fiber and yarns.	**1.1 Weaving terminologies-** **1.2 Weaving** **1.3 Fabric** 1.1.1 Ends /Warp 1.1.2 Picks / Weft 1.1.3 Selvedge 1.1.4 Ends / Inch and Picks /Inch 1.1.5 Reed Count and warping calculations 1.1.6 Thread Count **1.2 Knitting– terminologies-** 1.2.1 Warp 1.2.2 Weft **1.3 Bonding-** 1.3.1 Non-Woven 1.3.2 Felting **1.4 Fiber:-** 1.4.1 Staple Fiber, 1.4.2 Filament Fiber 1.4.3 Monofilament or multifilament Fiber **1.5 Yarn-** 1.5.1 Thrown Yarns 1.5.2 Spun Yarns
UNIT 2 NATURAL FIBRE (Weightage-16Marks , Hrs- 12)	

Unit Outcomes (Uos) (in cognitive domain)	Topics and Sub-topics
2a. Enlist the types of cellulosic fibers and protein fibers. 2b. Give classification of natural fibers 2c. State manufacturing of cotton fiber. 2d. Explain the cultivation of silk. 2e.Differentiate between woolens and worsted. 2f. Draw flow chart of manufacturing process.	**Introduction and classification of Textile Fibers and Natural Fibers-** **2.1 Manufacturing process of Cellulosic Fibers-** 2.1.1 Cotton 2.1.2 Linen **2.2 Manufacturing process of Protein Fibers-** 2.2.1 Wool 2.2.2 Silk
UNIT 3 MANMADE OR ARTIFICIAL FIBRES (Weightage-14Marks , Hrs- 12)	
Part A: 3a. Give classification of manmade fiber. 3b. Enlist thermoplastic fibers. Explain manufacturing process of any one. 3c. Explain manufacturing process of viscose rayon 3d. State the uses of asbestos and glass 3e. Draw flow chart of manufacturing process.	**Introduction and Classification of Manmade Fibers-** **3.1 Manufacturing process of Thermo plastics fibers** – 3.1.1 Nylon 3.1.2 Polyester **3.2 Manufacturing process of Non-Thermoplastic fiber** – 3.2.1 Viscose Rayon 3.2.2 Acetate Rayon **3.3 Manufacturing process of Mineral Fibers** – 3.3.1 Asbestos & Glass
UNIT 4 YARN FORMATION (Weightage-14Marks, Hrs- 12)	
4a. State the types of yarns according to its characteristics 4b. Define blending of yarns. 4c. Give characteristics of coral and spiral yarns. 4d. Explain S and Z twist of yarns.	**4.1 Classification of Yarn and its Characteristics-** 4.1.1 Simple Yarn – 2 ply. 4 ply Multiple and Cable. 4.1.2 Novelty Yarn – Single, Coral, Spiral, Knot, Chenille, Gimpy, Slub **4.2 Blending of Yarn** **4.2.1 Twisting of Yarn according to direction-** (S & Z Twist, Low twist, Hard twist, Crape twist, Twist per

Unit Outcomes (Uos) (in cognitive domain)	Topics and Sub-topics
4e. State qualitative testing of yarns.	Inch) **4.3 Testing of Yarn-** 4.3.1 Qualitative Testing 4.3.2 Quantitative Testing
UNIT 5 FABRICS FROM YARNS (Weightage-12Marks , Hrs- 08)	
5a. Define flat braid and round braid. 5b. Define bobbinet and tulle. 5c. Explain the process of lace manufacturing.	**5.1 Braids** – Processing 5.1.1 Terminology- Flat and Round braids **5.2 Net**- Processing 5.2.1 Terminology- Bobbinet, Malines and Tulle **5.3 Laces**- Processing 5.3.1 Parts of Lace- Bride or reseau, Cordonnet,, Picot, toile 5.3.2 Types of laces- All over lace, Flouncing, Galloon, Insertion, Edging, Beading,Medallion
UNIT –VI FABRIC FROM ANIMAL SKIN (Weightage-08Marks , Hrs- 08)	
6a. Define tanning of leather. 6b. State the characteristics of suede. 6c. State the types of fur.	**6.1 Leather**- Introduction of leather and suede **6.1.1 Terminologies**- Vegetable tanning, Chrome tanning, Alum tanning. **6.2 Fur**- Introduction and Types

6. SUGGESTED SPECIFICATION TABLE FORQUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	**Terminology of Textiles**	12	10	02	04	16
II	**Natural Fiber**	12	10	01	05	16
III	**Manmade or Artificial Fibers**	12	08	02	04	14
IV	**Yarn Formation**	12	08	03	03	14
V	**Fabrics From Yarns**	08	05	02	05	12
VI	**Fabric from Animal Skin**	08	03	01	04	08
Total		**64**	**44**	**11**	**25**	**80**

7. SUGGESTED LEARNING RESOURCES

S.N.	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	Fiber to Fabric	Bernard P. Carbman, N. Yoris MGH	0-07-013137-6
2	Text Book of Clothing ,Textile and Laundry	N. Delhi Kalyani, Gupta Sushma	----------
3	Fashion Production Terms	Debble Ann Gioello and Beverly Berke, , 13-978-0870052002 10-0870052004, Fairchild publications	0870052004,9780870052002
4	Fundamentals of Textile and Textile Design	MellerSusan,Hydrabad orient longmarFocal press N.Y.	----------
5	Guide to Clothing	Theodora Failola Priest	----------

8. SOFTWARE/LEARNING WEBSITES

1.Apparel Clothing Manufacturing
2.https://en.wikipedia.org/wiki/Textile_manufacturing
3 https://textilelearner.blogspot.com/2012/02/textile-manufacturing-process-process.html

9. PO - COMPETENCY- CO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	_-	-	1	2	-	-
CO2	3	_-	1	1	-	-	1
CO3	3	1	-	2	2	-	1
CO4	3	-	-	1	1	-	1
CO5	3	1	1	3	2	-	1

	PSO1	PSO2
CO1	3	-
CO2	2	1
CO3	1	2
CO4	1	1
CO5	3	2

Sign: Name: Smt.S.M.Waghchaure (Course-Expert)	Sign: Name: Smt.C.M.Ambikar (Program Head of Department)
Sign: Name: ShriA.S.Zanpure (CDC)	

Government Polytechnic, Pune

'180OB' – Scheme

Programme	Diploma in ET/CE/EE//ME/MT/CM/IT/**DDGM**
Programme code	01/02/03/04/05/06/07/**08**/16/17/21/22/23/24/26
Name of Course	**Fundamental of Embroidery**
Course Code	**DD-2102**
Prerequisite course code and name	--

1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)		Examination Scheme				
					Theory		Practical		Total Marks
L	T	P	C		ESE	PA	*ESE	PA	
00	00	04	04	Marks	-	-	50	50	100
				Exam Duration	-	-	3 Hr		

***(*):**OE/POE (Oral Examination/Practical&Oral Examination mention whichever is applicable)*

Legends: L- lecture,T-Tutorial/teacher guided theory practice,P-practical,ESE-End semester examination,PA- Progressive Assesment.

2. RATIONALE

This course provide the knowledge of embellishing the apparel products through art skills.After completing this course student will be able to develop hand embroidery product by using appropriate needles,threads and motifs.

3. COMPETENCY

The aim of this course is to attend following industry identified competency through various teaching learning experiences:

- **Develop Hand embroidery design on Apparel Product.**

4. 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**:**

CO1:Use Straight Stitch design on an article
CO2:Emblished an apparel product by using Loop stitch .
CO3:Make an article by using knot stitch.
CO4:Enhance an apparel product by using Laid & Couched
CO5:Develop motif and embellished the article with Composite Family and innovative
embroidery

5. 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**:**

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required.
1	**I Straight Stitch Family**	Prepare a sample by using Straight Stitch Family- Running Stitch, Back Stitch,Satin Stitch,Holbein Stitch,Seed Stitch,Fern Stitch.	CO1	10
2.	**II Looped Family**	Make a sample by using Looped Family – Chain Stitch Button Hole Stitch Feather Stitch	CO2	10
3.	**III Knotted Family**	Prepare a sample by using Knotted Family – Bullion Knot, French Knot	CO3	10
4.	**IV Laid & Couched Family**	Prepare a sample by using Laid & Couched Family -Square Laid Work ,BasicCouching,Bokhara Couching	CO4	10
5.	**V Composite Family**	Make a sample by using Composite Family – Wheat Ear Stitch,Whipped Long Tack Daisy,Spider Web	CO5	10
6.	**VI Innovative stitch**	Prepare a sample by using Silk ribbon embroidery	CO5	06
7.	**VI Innovative stitch**	Develop design motif and embellished the article by using all the basic embroidery	CO5	08
		Total Hrs		**64**

Sr.No.	Performance Indicators	Weightage in %
a.	Preparing or tracing of motif on fabric.	10
b.	Handling of instruments and material during performing practical	10
c.	Follow Safety measures	10
d.	Accuracy in performance	10
e.	Finishing in performance	10
Total		**50**

6. MAJOR EQUIPMENT/ INSTRUMENTSREQUIRED

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

Sr.No.	Major Equipment/ Instruments Required	PrO. No.
1	Tracing tools-Tracing wheel,tracing paper,yellow croban Marking tools-Tailors chalk Cutting tools-Scissor,Pinking shear Finishing tools- Iron Hand embroidery Needles,thread, , cotton,silk ,muslin fabric	1 to7
2	Tracing tools-Tracing wheel,tracing paper,yellow croban Marking tools-Tailors chalk Cutting tools-Scissor,Pinking shear Finishing tools- Iron Thread,zardosi,sequence silk ribbon, cotton,silk ,muslin fabric,metal thread	1to 7

7. SUGGESTED STUDENT ACTIVITIES

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

a. Prepare folder based on practical performed in laboratory.

b. Prepare flow charts diagram of each embroidery family

8. SUGGESTED LEARNING RESOURCES

S.N.	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	Bats ford Encyclopedia of embroidery stitches	Anne Butler	Chrysalis Books ISBN-13: 978-0713438499
2	Complete Guide to Needle	Virginia Colton	Reader's digest ISBN-10: 0895770598
3	Indian Embroidery	Rosemary crill	Victoria & Albert Museum ISBN-13: 978-1851773107

9. SOFTWARE/LEARNING WEBSITES

1.wwwsewguide.com
2.wwwpinterest.com

10. PO - COMPETENCY- CO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	**3**	**-**	**2**	**-**	**-**	**1**	**1**
CO2	**3**	**-**	**2**	**-**	**-**	**-**	**1**
CO3	**3**	**-**	**-**	**-**	**-**	**-**	**1**
CO4	**3**	**-**	**-**	**-**	**-**	**-**	**1**
CO5	**3**	**-**	**2**	**-**	**-**	**-**	**1**

	PSO1	PSO2
CO1	**1**	**-**
CO2	**1**	**1**
CO3	**1**	**-**
CO4	**2**	**2**
CO5	**1**	**-**

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Government Polytechnic, Pune

'180OB' – **Scheme**

Programme	Diplôma in ET/CE/EE//ME/MT/CM/IT/**DDGM**
Programme code	01/02/03/04/05/06/07/**08**/16/17/21/22/23/24/26
Name of Course	**Fashion Drawing**
Course Code	**DD2103**
Prerequisite course code and name	**NA**

1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)		Examination Scheme				
					Theory		Practical		Total Marks
L	**T**	**P**	**C**		**ESE**	**PA**	***ESE**	**PA**	
00	04	00	04	**Marks**	00	00	50	50	100
				Exam Duration	--	--	2 hrs	--	

(*): *OE/POE (Oral Examination/Practical Oral Examination mention whichever is applicable)*

Legends: L- lecture-Tutorial/teacher guided theory practice-practical, ESE-End semester examination, PA- Progressive Assessment.

2. RATIONALE

This course provides foundation for drawing, proportion, figure type that enables the students to develop skills of illustration. It also develops Skill of Accessories designing, Traditional Painting, textile designing through swatch rendering using appropriate color scheme.

3. COMPETENCY

The aim of this course is to attend following industry identified competency through various teaching learning experiences:

Develop motif , swatch and traditional painting with suitable color scheme.

4. COURSE OUTCOMES (COs)

The practical experiences 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**:**

1. Classify the facial features of human anatomy

2. Illustrate Proportionate male female and kids croquie.
3. Able to render color wheel and color scheme.
4. Render different textile print, painting and embroidery
5. Design Trendy Accessories.

5. 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**:**

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required.
1.	I.	**Face feature Blocking-** Draw basic blocking of Eyes, Lips, Nose, Arms, Hands, legs and foot.	1,2	08
2.		Draw Face dimension with hairstyles(Front,3/4,Side and Rare View	1,2	04
	II	**Mechanical Croquie** Illustrate 8 head and 10 head mechanical croquie with flesh (Male, Female)	1,2	04
		Illustrate proportionate kids croquie.	1,2	04
	III	**Color** Draw and render Color wheel.	3,4	04
		Render Gray Scale and Value Scale(primary, secondary, tertiary colors)	3,4	06
7.		Illustrate a single design and render it using color scheme-Complementary Color Scheme, Double Complementary Color Scheme, Split Complementary Scheme, Double Split Complementary Color Scheme, Warm Color Scheme, Cool Color Scheme	3,4	08
8.		Illustrate a single design and render it using color scheme-Analogous Color Scheme, Achromatic Color Scheme, Monochromatic color scheme, Polychromatic color scheme, Triad color scheme.	3,4	06
9.	IV	**Swatch Rendering** Render Fabric Swatch using Review of movie recent prints-Floral, Geometrical, Ethnic , Abstract and Conversational	3,4	08
10.		Draw the specimen of Traditional Painting –Warli, Madhubani and Kalamkari	3,4	08
11.	V	**Accessories** Illustrate and render accessories- Hair clip, watches, Necklace set, Handbags and footwear.etc	3,5	04
		Total Hrs		**64**

Sr .No.	Performance Indicators	Weightage in %
f.	Sketching (Basic)	05

Sr .No.	Performance Indicators	Weightage in %
g.	Developing Design	20
h.	Render with suitable Colors Combination.	15
i.	Page Composition and Presentation	05
j.	Completion of Work and Neatness	05
Total		**50**

6. MAJOR EQUIPMENT/ INSTRUMENTSREQUIRED

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

Sr.No.	Major Equipment/ Instruments Required	PrO. No.
1	Drawing Table and Drawing Board	1 -11
2	Stationery Material-Drawing Sheets	1 -11
3.	Colouring Material-Poster Color, Staddlers, Markers, etc	1 -11

7. SUGGESTED STUDENT ACTIVITIES

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

c. Conversion of croquie from 8 to 10 and 10-12 head
d. Render color wheel (24 parts)
e. Prepare a micro Projects on Traditional Painting.
f. Prepare E-Journal of fabric Swatch/Cut outs of Different color Scheme .
g. Trendy Accessories collection and categorization.

8. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

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

a. 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).
b. With respect to item No.8, teachers need to ensure to create opportunities and provisions for ***co-curricular activities***.
c. Guide student(s) in undertaking micro-projects.
d. Correlate subtopics with similar designing software's.
e. Use proper equivalent analogy to explain different concepts.
f. Use Flash/Animation to explain various components and operation.
g. Teacher should ask the students to go through instruction and Technical manuals

9. SUGGESTED LEARNING RESOURCES

S.N.	Title	Author, Publisher, Edition and Year of publication	ISBN Number

1.	Ladies Fashion Illustration	Author-Kojiro kumagai Publisher- Nippan ,2nd ed.Edition May1 1987	ISBN-10:4766102673 ISBN-13:978-4766102673
2.	Fashion Drawing :The Basic Principles	Author-Anne Allen,Julian Seamen Publisher- BatsfordLtd 5 May 1993	ISBN-10:0713470968 ISBN-13:978-0713470963
3.	Fashion Design Drawing and Presentation	Author-Patrik John Ireland Publisher- BatsfordLtd 28 July 1982	ISBN-10:0713435194 ISBN-13: 978-0713435191
4.	New Fashion Illustrations	Author-Kojiro kumagai Publisher- Kodansha Co. Ltd. 22 Dec 2000	ISBN-10:4062065339 ISBN-13: 978-4062065337

10. SOFTWARE/LEARNING WEBSITES

1 http://en.m.wikipedia.org
2. www.google.com
3. www.pinterest.com
4. http://youtu.be/9NxAYNipaDQ
5. http://euroartclass.weebly.com/elements-of-design.html
6. http://youtu.be/YnXirHa6vn0
7. http://pin.it/4Eo7O8V

11. PO - COMPETENCY- CO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	*2*	*0*	*0*	*0*	*0*	*0*	*0*
CO2	*2*	*0*	*0*	*0*	*0*	*0*	*0*
CO3	*3*	*0*	*0*	*0*	*0*	*0*	*0*
CO4	*3*	*0*	*0*	*0*	*2*	*0*	*2*
CO5	*3*	*0*	*0*	*0*	*0*	*0*	*2*

	PSO1	PSO2
CO1	-	-
CO2	-	-
CO3	-	-
CO4	2	3
CO5	2	3

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Sign: Name: Shri A.S.Zanpure (CDC)	

Government Polytechnic, Pune

'180OB' – Scheme

Programme	Diploma in ET/CE/EE//ME/MT/CM/IT/**DDGM**
Programme code	01/02/03/04/05/06/07/**08**/16/17/21/22/23/24/26
Name of Course	**Kid's Garment Manufacturing**
Course Code	**DD-2104**
Prerequisite course code and name	**----**

1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)		Examination Scheme				
					Theory		Practical		Total Marks
L	T	P	C		ESE	PA	*ESE	PA	
02	00	06	08	Marks	40	10	50	50	150
				Exam Duration	2 Hrs	30 mins	3 Hr		

***(*):**OE/POE (Oral Examination/Practical&Oral Examination mention whichever is applicable)*

Legends: L- lecture,T-Tutorial/teacher guided theory practice,P-practical,ESE-End semester examination,PA- Progressive Assesment.

2. RATIONALE

Pattern Development is the part and parcel of Apparel Industry. Student should be able apply the skills of pattern development from basic pattern by using various drafting sewing and finishing techniques. The student should be able to apply the technique of measuring Kid's figure size and create commercial pattern from basic pattern for kid's fashion industry.

3. COMPETENCY

The aim of this course is to help the students to attain apparel industry identified competency through teaching learning technique.

- **Develop commercial pattern for kids through innovative Apparel Manufacturing methods.**

4. 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**:**

CO1: Interpret kid's size chart for apparel pattern.
CO2: Identify the factors affecting kid's wear.
CO3: Apply the concept of fabric spreading and layout.
CO4: Explain importance of cost sheet.
CO5: Apply Apparel Manufacturing drafting ,cutting and sewing methods.

5. 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**:**

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required.
1.	**I Umbrella Skirt**	¼ Drafting of Umbrella Skirt, layout and cost sheet of Umbrella Skirt .	CO5	06
2.		Full scale drafting and cutting of Umbrella Skirt .	CO5	06
3.		Stitching and finishing of Umbrella Skirt .	CO5	08
4.	**II Party Frock**	¼ Drafting of Party Frock , layout and cost sheet of Party Frock.	CO5	06
5.		Full scale drafting and cutting of Party Frock.	CO5	06
6.		Stitching and finishing of Party Frock.	CO5	08
10.	**III Pinafore**	¼ Drafting of Pinafore, layout and cost sheet of Pinafore.	CO5	06
11.		Full scale drafting and cutting of Pinafore	CO5	06
12.		Stitching and finishing of Pinafore	CO5	08
13.	**IV Night Suit**	¼ Drafting of Night Suit , layout and cost sheet of Night Suit.	CO5	06
14.		Full scale drafting and cutting of Night Suit	CO5	06
15.		Stitching and finishing of Night Suit.	CO5	06
		Total Hrs		**96**

S.No.	Performance Indicators	Weightage in %
k.	Set up drafting, cutting and stitching materials.	10
l.	Handling of tools and machines during performing practical	10
m.	Follow Safety measures	10
n.	Accuracy in performance	10
o.	Submission in time	10
Total		**50**

6. MAJOR EQUIPMENT/ INSTRUMENTSREQUIRED

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

Sr.No.	Major Equipment/ Instruments Required	PrO. No.
1	Measuring tools-measuring tape, scale, French curve Tracing tools-Tracing wheel,tracing paper,yellow croban	1,2,4,5,7,8,10,11,13, and14
2	Marking tools-Tailors chalk	1,2,4,5,7,8,10,11,13, and14
3	Cutting tools-Scissor,knotcher	1,2,4,5,7,8,10,11,13, and14
4	Sewing tools-Needle,Bobbin and bobbin case,neddle clamp,thread,fabric sewing machine.	3,6,9,12, and15
5	Finishing tools- Iron	3,6,9,12,and 15
6	Stationary such as –pencil,erase,brown paper,practical book	1 to 15

7. THEORY COMPONENTS

The following topics/subtopicsshould betaught and assessed in order to develop UOs for achieving the COs to attain the identified competency**.**

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
UNIT 1. Introduction to Kid's wear (Weightage-10 , Hrs- 10)	
1a.Compare standard measurement of kid's chart. 1b. Describe the growth of children and adolescents. 1c.Identifytypes of design ,fabric, prints trims and lining for kid's wear. 1d. Classify the Brands for Kids	**1.1 Introduction to Kid's wear** 1.1.1Introducing kid's size chart 1.1.2The growth of children and adolescents 1.1.3Selection of designing (according to the age group/season) 1.1.4Selection of motifs /prints 1.1.5 Sourcing of fabric and trims 1.1.6Lining for Kid's wear 1.1.7Study of Brands for Kid's wear
UNIT 2 Factors affecting for kid's wear (Weightage- 12 , Hrs- 10)	
2a.Classify kid's costumer according to the age group. 2b.Describe the quality parameters requires for kid's garments. 2c. Enlist the fasteners and opening for kid's wear.	**2.1Factors affecting for kid's wear** 2.1.1 Identify kid's costumer(according to the age group) 2.1.2Determine needs and wants of kid's wear 2.1.3Quality Parameters for kid's Garment 2.1.4Safety measures 2.1.5 SFasteners and Opening for kid's wear-velco,zippers,snap 2.1. 6 Pricing 2.1.7Objective of pricing 2.1.8Internal factors of pricing 2.1.9External factors of pricing
UNIT 3 Fabric spreading and Layout (Weightage- 10, Hrs- 08)	

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
3a. Differentiate between machine spreading and manual spreading. 3b.Explain fabric layout.	**3.1Introduce spreading of fabric** 3.1.1 Machine spreading 3.1.2Manual spreading. 3.1.3Types of width of fabric 3.1.4Types of Layout- Lengthwise layout, open layout, cross and bias layout, double ply layout, and multi ply layout
UNIT 4 Cost sheet (Weightage- 08 , Hrs- 04)	
4a.Define cost sheet. 4b.List out the components of cost sheet. 4c.State the importance of cost sheet.	**4.1 Cost sheet** 4.1.1Defination of cost sheet 4.1.2Components of cost sheet 4.1.3Importance of cost sheet

8. SUGGESTED SPECIFICATION TABLE FORQUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	**Introduction to Kid's wear**	10	02	04	04	10
II	**Factors affecting for kid's wear**	10	04	04	04	12
III	**Fabric spreading and Layout**	08	02	04	04	10
IV	**Cost sheet**	04	02	02	04	08
Total		**32**	**10**	**14**	**16**	**40**

9. SUGGESTED STUDENT ACTIVITIES

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

h. Prepare journals based on practical performed in laboratory.
i. Study of Innovative Pattern from the Basic Pattern.
j. Prepare Flow-charts for the given garment construction.
k. Search information about up-coming Brands and Designers in Fashion Industry.
l. **Collect information of latest Runways and Garment Fairs and prepare charts of the same**.

10. SUGGESTED LEARNING RESOURCES

S.N.	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	Fashion Studies	NCERT-Publisher 1st Edition,2018	ISBN:10003200000012

2	Zarapkar system of cutting	Zarapkar K.R, Sale Publishers,Bombay-2014	ISBN:9788124301999
3	Metric Pattern Cutting for Children's Wear and Baby wear	Winifred Aldrich	ISBN.NO-978-0-632-05798-2

11. SOFSOFTWARE/LEARNING WEBSITES

1. **cbseacademic.nic.in**
2. **fibre2fashion.com**
3. **www.youtube com**
4. **www.gerbtechnology.com**

12. PO - COMPETENCY- CO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	-	-	1	-	-	2
CO2	3	2	2	3	1	1	2
CO3	3	2	2	2	1	1	2
CO4	3	2	2	2	1	2	2
CO5	3	3	3	3	3	3	3

	PSO1	PSO2
CO1	3	3
CO2	2	3
CO3	2	3
CO4	3	2
CO5	3	2

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Sign: Name: Shri A.S.Zanpure (CDC)	

Government Polytechnic, Pune

'180 OB' – Scheme

Programme	Diploma in ET/CE/EE//ME/MT/CM/IT/**DDGM**
Programme code	01/02/03/04/05/06/07/**08**/16/17/21/22/23/24/26
Name of Course	**Textile Chemistry**
Course Code	**SC 2107**

1. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)		Examination Scheme				
					Theory		Practical		Total Marks
L	**T**	**P**	**C**		**ESE**	**PA**	***ESE**	**PA**	
03	00	02	05	**Marks**	80	20	25	25	150
				Exam Duration	3 Hrs.	1 Hr.	2 Hrs.		

(*):*OE/POE (Oral Examination/Practical Oral Examination mention whichever is applicable)*

Legends: L- lecture-Tutorial/teacher guided theory practice,P-practical,ESE-End semester examination,PA- Progressive Assessment.

2. RATIONALE

Identify chemical properties of fibers by studying relevant chemical finishes, dyes, bleaches for increasing quality of fiber. Students should be aware of various basic parameters for quality fibers. Study of impurities and hardness in water and methods for water softening will help the students to make proper use of water.

3. COMPETENCY

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

Apply principles of textile chemistry to identify and maintain quality of fibers.

4. COURSE OUTCOMES (COs)

The theory, practical experiences and behavioral skills associated with this course are to be taught andimplemented, so the student will able to exhibit the following Cos:

6. Identify physical and chemical properties of fibers.
7. Select chemical finishes for given fiber.
8. Use of dyes according to chemical properties.
9. Use relevant water treatment process to solve industrial problems.
10. Select relevant cleaning agent.

5. SUGGESTED PRACTICALS/ EXERCISES

The practical's 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**:**

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Relevant CO	Approximate Hours Required.
1.	1	Determine longitudinal and cross section of fiber (cotton, linen wool, silk nylon, polyester, and acrylic) by using pick glass.	1	04
2.		Compare characteristics of fibers (cotton, linen wool silk nylon, polyester, and acrylic) by burning test of fibers in flame	1	04
3.		Compare characteristics of fibers (cotton, linen wool silk nylon, polyester, acrylic) by Solubility test in chemical reagent.	1	04
4.	2	Removal of water-soluble sizes.	2	02
5.	3	Prepare of flow chart showing dying textile material (sample collection of textiles)	3	02
6.	4	Bleaching of cotton and silk by using hydrogen peroxide	3	04
7.	5	Determine of hardness of given water sample by EDTA method.	4	02
8.		Determine of chlorine hardness of water by Mohr's method	4	02
9.		Determine water hardness by using Soap test	4	02
10.	6	Stain removal of different fabrics by using acid and base or white petrol.	5	02
11.		Preparestarch, borax and gelatin solutions	5	04
		Total Hrs.		**32**

S.No.	Performance Indicators	Weightage in %
p.	Prepare experimental set up and chemicals required	20
q.	Handling of instruments and chemicals during performing practical.	20
r.	Follow Safety measures	10
s.	Accuracy in calculation and comparison and result	10
t.	Answers to questions related with performed practices.	20
u.	Submit journal report on time	10
v.	Follow Housekeeping	10
Total		**100**

6. MAJOR EQUIPMENT/ INSTRUMENTSREQUIRED

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

Sr.No.	Major Equipment/ Instruments Required	PrO.No.
1	Magnifying glass (pick glass.)	10

7. THEORY COMPONENTS

The following topics/subtopicsshould betaught and assessed in order to develop UOs for achieving the COs to attain the identified competency**.**

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
UNIT 1. TEXTILE FIBERS (Weightage-16,Hrs.-08)	
1a. Define textile fiber. 1b. State characteristics of textile fibers. 1c. Classifyfibers on the basis of their source. 1d. State physical and chemical properties of fibers. 1e. Comparefibers on the basis of physical and chemical properties.	**1.1** Definition of textile fibers, classification of fiber based on its source. **1.2** Physical and chemical properties of cotton, linen, wool, silk, asbestos fiber, nylon, polyester, acrylic. **1.3** Physical properties: composition, structure, length, strength, moisture absorption, shrinkage, resiliency, heat conductivity **1.4** Chemical properties: action of acids, action of alkalis, action of bleach, affinity for dyes.
UNIT 2. FINISHES(Weightage- 12,Hrs.- 09)	
2aDefine finishes. 2b. State purposes of finishing. 2c. Classify finishing based on textile processing. 2d. Describe preliminary treatment involved in finishing. 2e Explain effects of chemical finishes on fibers. 2f.Distinguish between waterproof and water repellent finishes.	2.1 Definition of finishes, purposes of finishing. 2.2 Classification of finishing on the basis of textile processing (mechanical finishes, chemical finishes) 2.3 Preliminary treatment involved in finishing, bleaching, scouring, singing, desizing. 2.4 Chemical finishes: mercerizing, Crease resistance, fire proof, and water proof, water repellent
UNIT 3. DYES(Weightage- 12,Hrs.- 09)	
3a. Define dyes 3b. Classify dyes according to their sources. 3c. List the types of dyes. 3d. Select relevant dyes for different fibers. 3e. Draw process flow chart of dyeing materials**.**	3.1 Definition of dye, classification of dyes according to their sources: natural dyes, vegetable, animal, mineral. Artificial dyes: direct or salt, basic, acidic, Sulphur, mordant, vat, disperse, reactive, 3.2 Dyes applied to fiber classes-cellulose fiber, polyamide, polyester, acrylic mineral, metallic, vinyl. 3.3 Process flow chart showing dyeing textile material.
UNIT 4. BLEACHES AND THEIR SUTABILITY (Weightage- 16,Hrs.- 08)	

Unit Outcomes (UOs) (in cognitive domain)	Topics and Sub-topics
4a. Define bleaching agent 4b. Classify bleaches 4c. State Purposes of bleaching 4d. Describe mechanism of bleaching 4e. Explain the action of oxidizing and reducing bleaches 4f. Describe over bleaching.	4.1 Definition of bleaching agent, classification of bleaches: oxidizing and reducing, Purposes of bleaching. 4.2 Mechanism of bleaching. 4.3 Oxidizing: sodium hypo chloride, hydrogen peroxide, sodium perborate, potassium permanganate, sunlight. 4.4 Reducing: sodium sulphite, sodium bisulphate, sodium thiosulphite, over bleaching.
UNIT 5.WATER (Weightage- 12,Hrs.- 06)	
5a. Define hard water and soft water 5b. State causes of hardness of water 5c. List types of hardness. 5d. Explain the bad effects of hard water in dye and textile industries. 5e. Describe the method of removal of hardness by zeolite process. 5f..Describe the method of removal of hardness by ion exchange method. 5g. State applications of pH in engineering. 5h. Calculate the pH and pOH . .	5.1 Definition of hard water and soft water, causes of hardness, types of hardness. 5.2 Bad effect of hard water in industries (textile, dye) 5.3 Removal of hardness by lime soda method, zeolite, ion exchange method 5.4 pH scale, applications of pH in engineering. Numerical based on pH and pOH
UNIT6.MAINTAINANCE OF FIBRES (Weightage- 12, Hrs.- 08)	
6a. List the components of soap and detergent. 6b. Describe action of soap and detergent. 6c. Distinguish between soap and detergent. 6d. Describe preparation of starch, gum, borax and gelatin solution. 6e. List types of blues. 6f. Explain bluing process. 6g. Classify stains. 6h. Select proper method of stain removal for different fabrics.	6.1Cleaning agent: soap- chemical composition, action of soap. Detergent: chemical composition, action of detergent Difference between soap and detergent. 6.2Stiffening agent: starch, gum, gelatin, borax, Preparation and application of starch solution, (Boiling water starch, Cold water starch) gum, borax, and gelatin. 6.3 Whitening agent: Laundry blues, types of blues, bluing process Stain removal- Classification of stains, methods of removal of stains from

8. SUGGESTED SPECIFICATION TABLE FORQUESTION PAPER DESIGN

Unit	Unit Title	Teaching	Distribution of Theory Marks

No.		Hours	R Level	U Level	A Level	Total Marks
I	**Textile fibre**	8	10	6	0	16
II	**Finishes**	9	6	4	2	12
III	**Dyes**	9	6	4	2	12
IV	**Bleaches and their sutability**	8	8	4	4	16
V	**Water**	6	6	4	2	12
VI	**Maintainance of fibres**	8	6	2	4	12
Total		**48**	**42**	**24**	**14**	**80**

9. SUGGESTED STUDENT ACTIVITIES

Other than the classroom and laboratory learning, following are the suggested student-related ***co-curricular*** activities which can be undertaken to accelerate the attainment of the various outcomes in this course: Students should conduct following activities in group and prepare reports of about 5 pages for each activity

m. Prepare journals based on practical performed in laboratory.
n. Preparation of flow chart showing dying textile materials.
o. Search information about new synthetic textile fibers.
p. Prepare posters to illustrate the use of different fibers.

10. 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:

h. Massive open online courses (***MOOCs***) may be used to teach various topics/sub topics.
i. 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).
j. With respect to item No.8, teachers need to ensure to create opportunities and provisions for ***co-curricular activities***.
k. Teacher should ask the students to go through instruction and Technical manuals

11. SUGGESTED MICRO-PROJECTS

NA

12. SUGGESTED LEARNING RESOURCES

S.N.	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	Polytechnic Chemistry.	V.P. Mehta, Jain brothers, New Delhi.	818360093X
2	Applied Chemistry	P.C.Jain and Monica Jain, DhanpatRai and sons, New Delhi.	9352160002
3	Applied Chemistry	S.N.Narkhede, M. M. Thatte, NiraliPrakashan, Pune.	Textbook
4	Text book of clothing and laundry	Shina Gupta, Renu Garg, Renusaini	Textbook

5	Elements of Textile Chemistry	(SNDT)	Textbook

13. SOFTWARE/LEARNING WEBSITES

1.https://en.wikipedia.org/wiki/Textile manufacturing
2 https://textilelearner.blogspot.com/2012/02/textile-manufacturing-process-process.html
3.https://en.wikipedia.org/wiki/List_of_textile_fibres
4.https://en.wikipedia.org/wiki/Finishing_(textiles)
5http://apsacwestridge.edu.pk/assets/admin/upload/notes/ClassificationOfDyes.pdf

14. PO - COMPETENCY- CO MAPPING

	PO1	PO2	PO3	PO4	PO5
CO1	**3**	**2**	**1**		**1**
CO2	**3**	**2**	**1**		**1**
CO3	**3**	**2**	**1**	**1**	**1**
CO4	**3**	**2**	**1**	**1**	**1**
CO5	**3**	**2**	**1**		**1**

	PSO1	PSO2
CO1	1	-
CO2	**1**	-
CO3	**1**	-
CO4	**1**	-
CO5	**1**	-

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Sign: **Name: C.M.Ambikar** **Programme Head**	**Sign:** **Name: A.S.Zanpure** **CDC Incharge**