

GUJARAT TECHNOLOGICAL UNIVERSITY (GTU)**Competency-focused Outcome-based Green Curriculum-2021 (COGC-2021)**

Semester-V

Course Title: Advance Textile Design & Printing

(Course Code: 4355904)

Diploma Programme in which this course is offered	Semester in which offered
Textile Design	5 th Semester

1. RATIONALE

Printing is the one of the most useful and old techniques to make textile beautiful and attractive to the customer. Printing is a value addition process by which we can add value in terms of price of the products. Now a days due to rapid change in technological advancement there are lots of change in weaving, embroidery, knitting and printing technology. In old days it was done by simply hand block and then roller printing to Flatbed to Rotary screen printing to latest development Sublimation digital printing to direct printing to Position printing technology. Advance printing technology includes latest development in Screen printing and another three latest development are sublimation printing, direct printing and position printing Advance printing Technology added two things in printing one is Quantity and second is the quality of the products. Since last few years sublimation printing and position printing technology has totally revolutionized printing industry. Advance printing technology are expected to be aware of creating various such designs on textiles to create variety, attraction, good looks, and aesthetics. Advance printing has major role in today's market capitalization of the printing textile.

2. COMPETENCY

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

To create new variety, innovative, creative, attractive textile designs by using various latest developments in spinning, weaving, knitting, embroidery and printing technology.

3. COURSE OUTCOMES (COs)

The practical exercises, the underpinning knowledge and the relevant soft skills associated with this competency are to be developed in the student to display the following COs:

- a) Understand the basic method of textile design by yarn, weaving, knitting, embroidery and printing technology.
- b) Identify the different types of the latest technological development in weaving, embroidery, knitting and printing.

- c) Apply recent development in textile printing looking to current textile printing styles, fashion design and technological developments.
- d) Appreciate the new techniques for printing like Sublimation printing, direct printing and position printing.

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (CI+T/2+P/2)	Examination Scheme				
L	T	P		Theory Marks		Practical Marks		Total Marks
00	-	06	03	CA	ESE	CA	ESE	
				00	00	100	100	

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

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

5. SUGGESTED PRACTICAL EXERCISES

The following practical outcomes (Pros) are the sub-components of the COs. These Pros need to be attained to achieve the Cos.

S. No.	Practical Outcomes (ProS)	Unit No.	Approx. Hrs. required
1.	Make chart of different method for the textile design for fabric.	I	04
2.	Make list of different printing and embroidery techniques to make decorative textile.	I	04
3.	Make list of different woven and knitting techniques to make decorative textile.	I	04
4.	Make the sample of design by using recent trends in manmade filament yarn.	I	04
5.	Make the sample of design by using recent trends in manmade spun yarn.	I	04
6.	Make the sample of design by using recent trends in natural fiber yarn.	I	04
7.	Make the sample of design by using recent trends in knitting technology.	II	04
8.	Make the sample of design by using recent trends in Embroidery design.	II	04
9.	Make the sample of design by using recent trends in Dobby woven design.	II	04
10.	Make the sample of design by using recent trends in Air jet Jacquard woven design.	II	04

11.	Make the sample of design by using recent trends in rapier Jacquard woven design.	II	04
12.	Make the sample of design by using recent trends in screen printing technology.	III	04
13.	Make the sample of design for saree or scarf by using recent trends in sublimation printing and recent trends in fashion design.	III	04
14.	Make the sample of design for dress material or kids wear by using recent trends in sublimation printing and recent trends in fashion design.	III	04
15.	Make the sample of design for home decoration textile by using recent trends in sublimation printing and recent trends in fashion design.	III	04
16.	Make the sample of design for saree or scarf for cotton fabric by using recent trends in direct printing and recent trends in fashion design.	IV	04
17.	Make the sample of design for Dupatta or Home decorative for cotton / viscose / Linen fabric by using recent trends in direct printing and recent trends in fashion design.	IV	04
18.	Make the sample of design for saree or scarf for viscose rayon fabric by using recent trends in position printing and recent trends in fashion design.	IV	04
19.	Make the sample of design for Dress material or home decoration textile for cotton fabric by using position printing and recent trends in fashion design.	IV	04
20.	Make the recent development in the Design studio in context to Woven, embroidery, knitting, printing and fashion design.	V	04
21.	Make the list of to do and not to do for design studio.	V	04
			84

Note

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

S. No.	Sample Performance Indicators for the PrOs	Weightage in %
1	Students' understanding and mastery indifferent type of textile material , machinery and their uses.	20
2	Implementation of various techniques used to produce different type of textile design.	20
3	Willingness and attitude to complete different	10

	assignment	
4	Initiative regarding innovative way to complete the assignment	20
5	Overall preparedness and progress during the assignment.	30
Total		100

6. MAJOR EQUIPMENT/ INSTRUMENTS AND SOFTWARE REQUIRED

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

S. No.	Equipment and Tool Name with Broad Specifications	PrO. No.
1	A3 Size Scanner , A3 Size Colour Printer	1 to 21
2	A3 size DrawingSheet , different sizes hoop , needles , Colour thread for fillingstitch , Fabric Sample	1 to 21
3	Scissors and cutter, Metallic rods different sizes	1 to 21
4	Wilcom , CLO ,Velentino ,Stichmax , Marvelous Designer Softwares	7 to 21
5	Different size of brushes	1 to 21
6	Card board, clip , pin	1 to 21

7. AFFECTIVE DOMAIN OUTCOMES

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

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

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

8. UNDERPINNING THEORY

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

Note: The Unit Outcomes (UOs) need to be formulated at different level of Revised Bloom's Taxonomy' to accelerate the attainment of the COs and the competency.

Unit	Unit Outcomes (UOs) (4 to 6 UOs at different levels)	Topics and Sub-topics
Unit I Introduction and Scenario of	1a. Define advance textile printing and design. 1b. Describe different textileMaterials and machinery for	1.1 History of different textile design methods. 1.2 Recent development in printing technology.

Unit	Unit Outcomes (UOs) (4 to 6 UOs at different levels)	Topics and Sub-topics
Advance textile design and printing	advance printing. 1c. Basic principle for the weaving and printing. 1d. Basic principle for the weaving and embroidery design.	1.3 Recent development in woven design and embroidery design.
Unit II Embroidery, woven and knitting design development	2a. Understand ancient embroidery, weaving and knitting technology 2b. Uses of different embroidery and woven design for the garment. 2c. Prepare new fabric design surface by applying different embroidery, woven design and knitting design patterns.	1.1 History of technological advancement in embroidery design software and machinery. 1.2 Recent trend Changes in embroidery and woven design pattern. 1.3 Technological changes and advancement in woven design software and weaving machinery. 1.4 Technological changes and advancement in knitting design software and machinery. 1.5 Advance embroidery, woven and knitting design exercise based on recent development.
Unit III Sublimation Printing technology (Digital printing)	3a. Enlist different techniques of Sublimation printing. 3b. Causes for the rapid acceptance and growth of the sublimation printing technology. 3c. Use of different paper and colour in sublimation printing. 3d. Uses of different fusing machine in sublimation printing.	3.1 Creation of new design by using Photoshop and CorelDraw software for different design. 3.2 Sublimation digital printing and fabric aesthetic property. 3.3 Sublimation color quality and fabric look 3.4 Sublimation as a game changer technology to prevent the textile industrial pollution. 3.5 Future demand and scope for the sublimation printing technology.
Unit IV Direct printing and Position printing technology (Digital printing)	4a. Enlist different fabric suitable for direct and position printing. 4b. Enlist different color uses in the direct and position print. 4c. General concept of direct and position printing technology. 4d. Recent development in direct and position printing technology.	4.1 Production and efficiency in direct and position printing machine. 4.2 Designer and worker requirement. 4.3 Cost and investment for the technology. 4.5 Unlimited design scope for new design and development. 4.6 Highly value addition in products 4.6 Recent trends and market demand in context to latest fashion design.
Unit V Design studio	5a. Uses of different software for design creation. 5b. Collection of yarn, fabric and garment sample for the new design creation. Create different design for the market.	5.1 Prepare a list of to do and not to do for world class design studio. 5.2 Professional and highly skill designer as a key to success of the design studio. 5.3 Understand the need of the customer and make the design accordingly. 5.4 Create the world class textile design in

Unit	Unit Outcomes (UOs) (4 to 6 UOs at different levels)	Topics and Sub-topics
	5c. Computer, printer and scanner for the design studio. 5d. Combine traditional and modern design concept for new look of the design.	context to local as well as international market.

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

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

9. SUGGESTED SPECIFICATION TABLE FOR QUESTION PAPER DESIGN

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	R Level	R Level	R Level
I	Introduction and Scenario of Advance textile design and printing	-NA-	-NA-	-NA-	-NA-	-NA-
II	Embroidery, woven and knitting design development					
III	Sublimation Printing technology(Digital printing)					
IV	Direct printing and Position printing technology(Digital printing)					
V	Design studio					

10. SUGGESTED STUDENT ACTIVITIES

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

- a) Visit production unit of Weaving, knitting, embroidery, printing and boutique.

- b) Undertake micro-projects of making various new textile design in context to latest fashion design trends in to the market.
- c) Develop new products by developing world class design studio and excellent design team.
- d) Visit Sublimation printing unit and teach the students how this new technology help to tackle the textile pollution and save the environment.

11. SUGGESTED SPECIAL INSTRUCTIONAL STRATEGIES (if any)

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

- a) Massive open online courses (**MOOCs**) may be used to teach various topics/sub topics.
- b) Guide student(s) to take micro-projects.
- c) Blend the basic concepts with more specialized instruction
- d) Visualization, Cooperative Learning, inquiry based instruction, differentiation, effective use of technology, think-pair and share etc. pedagogies can be implemented as per the enlisted course outcomes.
- e) Give at least 10 competitive problems for each course outcomes of this course.
- f) Practice, practice and practice - expose students to wide range of problems.
- g) About **20% of the traditional textile articles should be made by** students for **self-learning**, but to be assessed using different assessment methods.
- h) Using the natural resources and create new traditional textile. Also motivate the students for the self-enterprise (Own small start-up) which help to generate employability.
- i) Guide students on how to address issues on environment and sustainability using the knowledge of this course.

12. SUGGESTED MICRO-PROJECTS

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

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

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

Suggested List of Micro-Project.

1. Creative and innovative design development by using latest technology for weaving, knitting, embroidery and printing.
2. Arrange visit to different industry and exhibitions.
3. Make collection of different textile material sample based on weaving, embroidery, knitting and printing.

13. SUGGESTED LEARNING RESOURCES

S. No.	Title of Book	Author	Publication with place, year and ISBN
1	Decorative Design and Craftsmanship of India with over 10,000 design and motifs From the craft of India	Kamala Devi Chattopadhyay	Kalyani Publishers, 2008 ISBN:9788127244149
2	Embroidered Textiles (Traditional pattern from five continents)	Sheila Paine	Thames and Hudson-1990, ISBN:9780500235973
3	Studies in Indian Textiles	V. Suguna Sarma	Bharatiya Kala Prakashan 81-86050-13-2
4	Embroidered Textiles	Sheila Paine	Thames and Hudson 0-500-23597-X
5	Stenciling made easy (A complete beginner's guide)	Joanna sheen	Haldane mason, London-1995 ISBN:0-7525-1087-8
6	Digital textile printing	Susan Carden	Bloomsburry, Dec-2015 ISBN :- 9781472535672
7	Digital textile design	Ceri issac, Melanie bowles	Laurence king publishing ISBN :- 9781780673998,

	(second edition)		178067399X
8	Digital textile printing (Science, technology and market)	Hafeezullah memon, Hua wang	Elsevier science July-2023 ISBN :- 9780443154157, 0443154155
9	From print to stitch	Janet Edmonds	Search press. 13 sept, 2010 ISBN :- 1844484599
10	The complete guide to Designing and printing fabric	Laurie wisburn	A & C Black publishers Ltd, 15 oct. 2011 ISBN :- 1408147009, 978-1408147009
11	Digital Jacquard Design	Julie Holyoke	Bloomsbury visual Arts , 18 January 2019 ISBN-10 :- 1350108499, ISBN-13 :- 978-1350108493
12	Innovative Jacquard Textile Design Using Digital Technologies		Woodhead Publishing ISBN :- 9780857098702
13	Textile Design: Theory and concepts	Charu swami	New age international, January-2011 ISBN :- 9788122430530
14	Sustainable Design in Textiles and fashion	Subramanian senthikannan muthun	Springer, July-14, 2021 ISBN-13 :- 978-9811624650
15	Handbook of textile design, Principles, Processes and Practices	Jacque Wilson	Woodhead Publishing limited ISBN :- 1 85573 573 3

14. SUGGESTED LEARNING WEBSITES

- a) <http://www.atexco.com/>
- b) <https://www.efi.com/>
- c) <https://textilelearner.net/>
- d) <https://study.com/>
- e) <https://design.tutsplus.com/>
- f) <https://www.domestika.org/>
- g) <https://nsdcindia.org/>
- h) <https://medium.co>
- i) <https://www.textilesphere.com>
- j) <https://textilesfindia.in>
- k) <https://www.fibre2fashion.com>
- l) <https://www.youtube.com/watch?v=N-zRBXKLGvs>
- m) <https://www.youtube.com/watch?v=Tw5XzQFyXvY>
- n) <https://www.youtube.com/watch?v=33xn77HJ1ys>
- o) <https://www.youtube.com/watch?v=TIzPuCXJohE>

- p) <https://www.youtube.com/watch?v=5w7CUgOuGs8>
- q) <https://www.youtube.com/watch?v=tI93Po82pjE>
- r) <https://www.youtube.com/watch?v=xO14nSbidBI&t=777s>
- s) <https://www.youtube.com/watch?v=Hf7648iuWLo>
- t) <https://www.youtube.com/watch?v=TVSszEBNAXg>

u) 15. PO-COMPETENCY-CO MAPPING

Semester:-III rd	Textile Craft& Ornamentation						
	POs						
Competency & Course Outcomes	PO 1 Basic & Discipline specific knowledge	PO 2 Problem Analysis	PO 3 Design/development of solutions	PO 4 Engineering Tools, Experimentation & Testing	PO 5 Engineering practices for society, sustainability & environment	PO 6 Project Management	PO 7 Life-long learning
To create new variety, innovative, creative, attractive textile designs by using various latest developments in spinning, weaving, knitting, embroidery and printing technology.							
Course Outcomes							
CO a)	1	1	1	-	1	-	3
CO b)	2	2	2	1	2	1	3
CO c)	3	2	3	2	3	2	2
CO d)	3	3	2	2	3	1	3

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

16. COURSE CURRICULUM DEVELOPMENT COMMITTEE

GTU Resource Persons

Sr. No.	Name and Designation	Institute	Contact No.	Email
1.	Mr. M V Kanani, Lecturer	GPG Surat	9924185525	mvkanani12345@gmail.com
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