DEPARTMENT OF TECHNICAL EDUCATION (DIPLOMA SECTOR)
UTTAR PRADESH

CURRICULUM FOR DIPLOMA THREE YEAR (SIX SEMESTER) PROGRAMME
IN
TEXTILE DESIGN (PRINTING)

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Semester System

==========

YEAR 2025-2026

Prepared By:

INSTITUTE OF RESEARCH DEVELOPMENT & TRAINING, U.P., KANPUR

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PREFACE

An important issue generally debated amongst the planners and educator's world over is how technical education can contribute to sustainable development of the societies struggling hard to come in the same bracket as that of the developed nations. The rapid industrialization and globalization has created an environment for free flow of information and technology through fast and efficient means. This has led to shrinking of the world, bringing people from different culture and environment together and giving rise to the concept of world turning into a global village. In India, a shift has taken place from the forgettable years of closed economy to knowledge based and opens economy in the last few decades. To cope with the challenges of handling new technologies, materials and methods, we have to develop human resources having appropriate professional knowledge, skills and attitude. Technical education system is one of the significant components of the human resource development and has grown phenomenally during all these years. Now it is time to consolidate and infuse quality aspect through developing human resources, in the delivery system. Polytechnics play an important role in meeting the requirements of trained technical manpower for industries and field organizations. The initiatives are being taken by the State Board of Technical Education, UP to revise the existing curricula as per the needs of the industry and make NSQF compliant.

In order to meet the requirements of future technical manpower, we will have to revamp our existing technical education system and one of the most important requirements is to develop outcome-based curricula of diploma programmes. The curricula for diploma programmes have been revised by adopting time-tested and nationally acclaimed scientific method, laying emphasis on the identification of learning outcomes of diploma programme.

The real success of the diploma programme depends upon its effective implementation. However best the curriculum document is designed, if that is not implemented properly, the output will not be as expected. In addition to acquisition of appropriate physical resources, the availability of motivated, competent and qualified faculty is essential for effective implementation of the curricula.

It is expected of the polytechnics to carry out job market research on a continuous basis to identify the new skill requirements, reduce or remove outdated and redundant courses, develop innovative methods of course offering and thereby infuse the much-needed dynamism in the system.

F.R. Khan
Director
Institute of Research Development & Training

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2. Sh. F. R. Khan Director I.R.D.T. Kanpur continually motivating, guiding and taking keen interest in the review of the curriculum.

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4. CDC Officer and others concerning staff of IRDT for their support and assistance in conducting curriculum workshops.

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2. SALIENT FEATURES OF DIPLOMA PROGRAMME IN TEXTILE DESIGN (PRINTING)

1)	Name of the Programme	:	Diploma Programme in Textile Design(Printing)
2)	Duration of the Programme	:	Three years (Six Semesters)
3)	Entry Qualification	:	Matriculation or equivalent NEP-2020/NSQF Level 5 as Prescribed by State Board of Technical Education, UP
4)	Pattern of the Programme	:	Semester Pattern
5)	Ratio between theory and	:	40% (Theory) / 60% (Practical)

1) Industrial Training/Internship:

Four and six weeks of industrial training is made mandatory after the II and IV semesters during summer vacation. Total marks allotted to industrial training will be respectively 50 & 100.

In the last (6^{th} Semester) we have made the one semester Industrial training/Internship as optional along with usual classroom training.

2) Audit & Pathways:

As per AICTE and NEP-2020 directives, Essence of Indian Knowledge & Tradition, Indian Constitution, Entrepreneurship & Startup, subjects on Environmental Studies have been incorporated in the curriculum.

3) Student Centered Activities:

A provision of 4-8 hrs. per week has been made for organizing Student Centered Activities for overall personality development of students. Such activities will comprise co–curricular activities such as expert lectures, classroom seminars, games, hobby club like photography, painting, singing etc. declamation contests, field visits, NCC, NSS and other cultural activities, etc.

4) Project work:

Micro/Mini/Major project work has been included in the curriculum to enable the student to get familiarized with the practices and procedures being followed in the industries and provide an opportunity to work on some live projects in the industry.

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3. EMPLOYMENT OPPORTUNITIES OF DIPLOMA HOLDRERS IN TEXTILE – DESIGN (PRINTING)

i) Diploma holders in textile design may find employment in:

a. Medium & Small scale industries

b. Garment manufacturing industries

c. Garment Sales Emporium

d. Department of Education

e. Film Industry

f. Advertising industry

g. Modeling

h. Fashion Designing

i. Article Writing in Fashion magazines

j. Entrepreneur

k. Textile Designer

l. Boutique/Stencil/Screen Printing

m. Interior Decoration

n. Drawing & Painting

o. House hold decorative Textile Articles

p. Dying/Bleaching

q. Garment Manufacturing

r. Consultancy Services.

ii) Textile designers in textile mills, processing houses and garment export houses for:

- ► Developing designs for woven/printed fabric
- ► Developing graphic designs
- ► Colour matching and sample production
- ► Developing a library of designs
- ► Preparation of shade cards
- ► Reproducing fabric from given sample
- ► Woven label designs
- ► Developing computer aided textile designs

iii) Self employed/freelancers for:

- ► Preparing designs for woven/printed fabrics
- ► Preparation of designs for special fabrics, embroidery and wall hangings
- ► Preparation of illustrations for dress designers
- ► Preparation of designs for floor coverings, handloom, dobby, jacquard, tappet, terry towel, furnishing fabrics, khadi and hand printed textiles etc.
- ► Developing graphic design

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4. (A) PROGRAM OUTCOMES (POS)

PO1: Basics and Discipline specific Knowledge
Assimilate knowledge of basic and fundamentals in Textile Design (Printing).

PO2: Problem's Analysis and solution
Identify, analyze and solve problems using standard methods and established techniques.

PO3: Design and Development
Design solutions for technical problems.
Assist in designing components, systems, or processes to meet specific requirements.

PO4: Engineering Tools, Experimentation, and Testing

Use modern engineering tools and appropriate techniques to conduct experiments as per BIS standard.

PO5: Socio/ Economic /Environmental impact assessment/remedy.

Apply relevant technologies while considering societal needs, environmental impact keeping in view sustainable and ethical responsibilities.

PO6: Project Management and Communication
Apply engineering management principles, work effectively as an individual or in a team, and communicate clearly on activities.

PO7: Lifelong Learning
Recognize the importance of continuous learning and actively pursue self-improvement to keep pace with technological developments.

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4. (B) COURSE OUTCOMES (COS)

Sr.No.	Competency Profile	Curriculum Area
1.	Ability to observe and draw various objects from their surroundings in perspective with 3 dimensional effect to create designs based on their shapes, colours and textures.	-Basic Design & Sketching -Drawing, Rendering & study of Objects,
2.	Understanding of the concepts and principles of designs	-Principles of Design and Sketching (Fundamental of design, various types of motifs, their placements, value of a space, stylization, developing and enlarging design with combination of different colour and weaves.
3	Ability to design various forms over textile fabrics	-Textile Design
4.	Understanding of principles of colour, various techniques to create textures, colour schemes and colour ways	-Basic Design and Sketching -Textile Colouration (Introduction to colour theory, application of colour in designs to improve texture)
5.	Appreciation of traditional Indian Textiles and Art	- Indian traditional Design (History of Indian textiles and art Appreciation)
6.	Basic knowledge of textile materials and fabric constructions	-Textile Materials - Yarn Manufacturing Process (Textile Materials, operational knowledge of looms and fabric construction) - Garments & Fashion Studies
7.	Competencies for production of woven/knitted design	-fabric Structure - Fabric manufacturing Process (Basic techniques of designing)
8.	Competencies on dyeing and printing	-Textile Colouration -Textile Printing (classification of dye stuffs, methods and styles of dyeing and methods of printing)
9.	Competency in making use of computer for developing various textile designs	-Computer Aided Textile Design (CATD)
10.	Awareness regarding entrepreneurial support system and basic principles of management, ecology and environment, safety measures	-Professional studies(Entrepreneurial system, basic principles of management, environment education and safety precautions)
11.	Development of designs as per customers‟ requirement	-Major project (Application of knowledge and skills in creatingnew designs)

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12.	Competency to inspect the end product and ensure its quality	-Textile Testing & Quality Control
13.	Knowledge of interpersonal relations and skills in communication	-Communication skills - Universal Human Values -Project Work

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6. STUDY AND EVALUATION SCHEME FOR DIPLOMA PROGRAMME IN TEXTILE DESIGN(PRINTING)

FIRST SEMESTER

Sr. No.	SUBJECTS	COURSE TYPE & CATEGORY	STUDY SCHEME Periods/Week			CREDITS	MARKS INEVALUATION SCHEME								Total Marks of Internal & External
							INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
			L	T	P	C	Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
1.1	TEXTILE MATERIALS	PROGRAM CORE (THEORY)	3	-	-	3	40	-	**40**	60	3	-	-	**60**	100
1.2	PRINCIPLES OF DESIGN & SKETCHING	PROGRAM CORE (PRACTICUM)	3	-	6	6	40	-	**40**	60	3	-	-	**60**	100
1.3	YARN MANUFACTURING PROCESS	PROGRAM CORE (THEORY)	3	-	-	3	40	-	**40**	60	3	-	-	**60**	100
1.4	COMMUNICATION SKILLS IN ENGLISH	HUMANITIES & SOCIAL SCIENCE (THEORY/PRACTICAL)	3	-	2	4	40	60	**100**	60	3	40	3	**100**	200
1.5	TEXTILE MATERIALS (Lab)	PROGRAM CORE (PRACTICAL)	-	-	6	3	-	60	**60**	-	-	40	3	**40**	100
1.6	SPORTS & YOGA	HUMANITIES & SOCIAL SCIENCE (PRACTICAL)	-	-	2	1	-	50	**50**	-	-	-	-	**-**	50
# STUDENT CENTERED ACTIVITIES (SCA)			-	-	8	8	-	50	**50**	-	-	-	-	**-**	50
TOTAL			**12**	**-**	**24**	**20**	**160**	**220**	**380**	**240**		**80**		**320**	**700**

Student Centered Activities will comprise of co-curricular activities like extension lectures, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visit, Library, N.C.C., NSS, Cultural Activities and self-study etc. The lecture allotted to SCA can also be utilized for the course completion of other subjects.

Note -

1) Each period will be 60 minutes duration.
2) Each session will be of 16 weeks.
3) Effective teaching will be at least 14 weeks.

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SECOND SEMESTER- TEXTILE DESIGN(PRINTING)

Sr. No.	SUBJECTS	COURSE TYPE & CATEGORY	STUDY SCHEME Periods/Week			CREDITS	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External
							INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
			L	T	P	C	Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
2.1	TEXTILE COLORATION	PROGRAM CORE (THEORY)	4	-	-	4	40	-	**40**	60	3	-	-	**60**	100
2.2	TEXTILE COLORATION (Lab)	PROGRAM CORE (PRACTICAL)	-	-	6	3	-	60	**60**	-	-	40	3	**40**	100
2.3	INDIAN TRADITIONAL DESIGN	PROGRAM CORE (PRACTICUM)	3	-	6	6	40	-	**40**	60	3	-	-	**60**	100
2.4	INTRODUCTION TO IT AND AI	ENGINEERING SCIENCE (THEORY/ PRACTICAL)	2	-	4	4	40	60	**100**	60	3	40	3	**100**	200
2.5	DRAWING RENDERING & STUDY OF OBJECTS (Lab)	PROGRAM CORE (PRACTICAL)	-	-	6	3	-	60	**60**	-	-	40	3	**40**	100
2.6	*ENVIRONMENTAL SCIENCES	AUDIT COURSE	3	-	-	-	-	-	**-**	60	3	-	-	**60**	N/A
# STUDENT CENTERED ACTIVITIES (SCA)			-	-	2	-	2	50	**50**	-	-	-	-	**-**	50
Total			**12**	**-**	**24**	**20**	**120**	**230**	**350**	**180**		**120**		**300**	**650**

*Environmental Sciences will be an audit subject and non-credit. It is compulsory to pass the examination, but the marks will not be included in the division and percentage of obtained marks.

Student Centered Activities will comprise of co-curricular activities like extension lectures, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visit, Library, N.C.C., NSS, Cultural Activities and self-study etc. The lecture allotted to SCA can also be utilized for the course completion of other subjects.

Note -

Summer Internship of 4 Weeks duration to be organized after II-semester exam. Evaluation will be in III-Semester

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THIRD SEMESTER TEXTILE DESIGN(PRINTING)

Sr. No.	SUBJECTS	COURSE TYPE & CAT-EGORY	STUDY SCHEME Periods/Week			Credits	MARKS INEVALUATION SCHEME								Total Marks of Internal & External
							INTERNAL AS-SESSMENT			EXTERNAL ASSESS-MENT					
			L	T	P		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
3.1	TEXTILE PRINTING & FINISHING	PROGRAM CORE (THEORY)	03	-	-	03	40	-	40	60	3	-	-	60	100
3.2	TEXTILE PRINTING & FINISHING (Lab)	PROGRAM CORE (PRACTICAL)	-	-	06	03	-	60	60	-	-	40	3	40	100
3.3	FABRIC STRUCTURE	PROGRAM CORE (THEORY)	04	-	-	04	40	-	40	60	3	-	-	60	100
3.4	FABRIC STRUCTURE (Lab)	PROGRAM CORE (PRACTICAL)	-	-	06	03	-	60	60	-	-	40	3	40	100
3.5	COMPUTER AIDED TEXTILE DESGIN-I (Lab)	PROGRAM CORE (PRACTICAL)			06	03	-	60	60	-	-	40	3	40	100
3.6	ADVANCE SKILL DEVELOPMENT	(Q) OPEN ELECTIVE-1 (THEORY)	02	-	-	2	50	-	-	-	-	-	-	-	N/A
		(Q) OPEN ELECTIVE-1 (Certification Course)					-	-	-	-	-	-	-	-	N/A
3.7	SUMMER INTERNSHIP** (4 WEEKS)		-	-	-	2	-	50	50	-	-	-	-	-	50
#STUDENT CENTERED ACTIVITIES			-	-	09	-	-	50	50	-	-	-	-	-	50
Total			**09**		**27**	**20**	**80**	**280**	**360**	**120**		**120**		**240**	**600**

(Q) It is compulsory to appear and to pass the examination, but marks will not be included for percentage and division of obtained marks.

Advance skill development mention at the table provides the scope of selecting the course as per choice from the elective list provided in the syllabus conducted by various agencies of repute of duration not less than 20 Hrs (Offline/Online).

Student Centered Activities will comprise of co-curricular activities like extension lectures, games, hobby clubs e.g. Photography etc., Seminars, Declamation Contests, voluntary contribution in physical activities, Educational Field Visits, NCC, NSS, Cultural Activities and Self-Study.

** Students will present a seminar on their summer internship along with certificate, project and report.

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FOURTH SEMESTER TEXTILE DESIGN(PRINTING)

Sr. No.	SUBJECTS	COURSE TYPE & CATEGORY	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External
							INTERNAL AS-SESSMENT			EXTERNAL ASSESSMENT					
			L	T	P		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
4.1	ADVANCE TEXTILE PRINTING	PROGRAM CORE (THEORY)	06	-	-	06	40	-	40	60	3	-	-	60	100
4.2	TEXTILE DESIGN -I	PROGRAM CORE (THEORY)	04	-	-	04	40	-	40	60	3	-	-	60	100
4.3	TEXTILE DESIGN –I (Lab)	PROGRAM CORE (PRACTICAL)	-	-	04	02	-	60	60	-	-	40	3	40	100
4.4	COMPUTER AIDED TEXTILE DESGIN-II	PROGRAM CORE (PRACTICAL)	-	-	04	02	-	60	60	-	-	40	3	40	100
4.5	PROGRAM ELECTIVE -1	PROGRAM CORE (THEORY)	03	01	-	04	40	-	40	60	-	-	3	60	100
4.6	ADVANCE SKILL DEVELOPMENT	(Q) OPEN ELECTIVE-2 (THEORY)	02	-	-	02	50	-	-	-	-	-	-	-	N/A
		(Q) OPEN ELECTIVE-2 (Certification Course)					-	-	-	-	-	-	-	-	N/A
4.7	(Q)ESSENCE OF INDIAN KNOWLEDGE AND TRADITION	AUDIT COURSE	02	-	-	-	50	-	50	-	-	-	-	-	N/A
#STUDENT CENTERED ACTIVITIES			-	-	10	-	-	50	50	-	-	-	-	-	50
Total			**17**	**01**	**18**	**20**	**120**	**170**	**290**	**180**	**-**	**80**	**-**	**260**	**550**

.(Q) It is compulsory to appear and to pass the examination, but marks will not be included for percentage and division of obtained marks.

Advance skill development mention at the table provides the scope of selecting the course as per choice from the elective list provided in the syllabus conducted by various agencies of repute of duration not less than 20 Hrs (Offline/Online).

Student Centered Activities will comprise of co-curricular activities like extension lectures, games, hobby clubs e.g. Photography etc., Seminars, Declamation Contests, voluntary contribution in physical activities, Educational Field Visits, NCC, NSS, Cultural Activities and Self-Study.

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FIFTH SEMESTER TEXTILE DESIGN(PRINTING)

Sr. No.	SUBJECTS	COURSE TYPE & CATEGORY	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External
							INTERNAL ASSESSMENT			EXTERNAL ASSESS-MENT					
			L	T	P		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
5.1	TEXTILE TESTING & QUALITY CONTROL	PROGRAM CORE (THEORY)	03	-	-	3	40	-	40	60	3	-	-	60	100
5.2	TEXTILE TESTING & QUALITY CONTROL (Lab)	PROGRAM CORE (PRACTICAL)	-	-	06	3	-	60	60	-	-	40	3	40	100
5.3	TEXTILE DESIGN -II	PROGRAM CORE (THEORY)	03	-	-	3	40	-	40	60	3	-	-	60	100
5.4	TEXTILE DESIGN -II (Lab)	PROGRAM CORE (PRACTICAL)	-	-	06	3	-	60	60	-	-	40	3	40	100
5.5	PROGRAM ELECTIVE-2	PROGRAM CORE (THEORY)	03	-	-	3	40	-	40	60	3	-	-	60	100
5.6	PROGRAM ELECTIVE-3	PROGRAM CORE (THEORY)	03	-	-	3	40	-	40	60	3	-	-	60	100
5.7	(Q)INDIAN CONSTITUTION	AUDIT COURSE	02	-	-	-	50		50						N/A
5.8	SUMMER INTERNSHIP** (6 Weeks)		-	-	-	2	-	60	60	-	-	40	3	40	100
	#STUDENT CENTERED ACTIVITIES	-	-	-	10	-		50	50	-	-	-	-		50
Total			**14**	**-**	**22**	**20**	**160**	**230**	**390**	**240**	**-**	**120**	**-**	**360**	**750**

(Q) It is compulsory to appear and to pass the examination, but marks will not be included for percentage and division of obtained marks.

** Students will present a seminar on their summer internship along with certificate, project and report.

Student Centered Activities will comprise of co-curricular activities like extension lectures, games, hobby clubs e.g. Photography etc., Seminars, Declamation Contests, voluntary contribution in physical activities, Educational Field Visits, NCC, NSS, Cultural Activities and Self-Study.

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NORMAL PATHWAY

SIXTH SEMESTER TEXTILE DESIGN(PRINTING)

Sr. No.	SUBJECTS	COURSE TYPE & CATEGORY	STUDYS CHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External
							INTERNAL ASSESSMENT			EXTERNAL AS-SESSMENT					
			L	T	P		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot	
6.1	PROFESSIONAL STUDIES	PROGRAM CORE (THEORY)	04	-	-	4	40	-	40	60	-	-	3	60	100
6.2	ENTREPRENEURSHIP AND START-UPS	HUMANITIES & SOCIAL SCIENCE	02	-	-	2	40	-	40	60	3	-	-	60	100
6.3	IN-HOUSE PROJECT	PROJECT	04	-	16	12	-	240	240	-	-	160	-	160	400
6.4	ADVANCE SKILL DEVELOPMENT	(Q) OPEN ELECTIVE-3 (THEORY)	02	-	-	2	50	-	-	-	-	-	-	-	N/A
		(Q) OPEN ELECTIVE-3 (Certification Course)					-	-	-	-	-	-	-	-	N/A
#STUDENT CENTERED ACTIVITIES			-	-	8	-	-	50	50	-	-	-	-	-	50
Total			**12**	**-**	**24**	**20**	**80**	**290**	**370**	**120**		**160**		**280**	**650**

NOTE: -

(Q) It is compulsory to appear and to pass the examination, but marks will not be included for percentage and division of obtained marks.

Advance skill development mention in the table provides the scope of selecting the course as per choice from the elective list provided in the syllabus conducted by various agencies of repute of duration not less than 20 Hrs (Offline/Online).

Student Centered Activities will comprise of co-curricular activities like extension lectures, games, hobby clubs e.g. Photography etc., Seminars, Declamation Contests, voluntary contribution in physical activities, Educational Field Visits, NCC, NSS, Cultural Activities and Self-Study.

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OR

INDUSTRIAL PATHWAY

SIXTH SEMESTER TEXTILE DESIGN(PRINTING)

Sr. No.	SUBJECTS	CATEGORY & COURSE TYPE	STUDY SCHEME Periods/Week			Credits(C) (L+T)+P=C	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External	ASSESSMENT
							INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT						
			L	T	P		Th	Pr	Tot	Th	Hrs.	Pr	Hrs	Tot		
6.1	ENTREPRENEURSHIP AND START-UPS (ONLINE MODE)	HUMANITIES & SOCIAL SCIENCE (THEORY)	-	-	-	2	-	-	-	100	03	-	-	100	**100**	**THEORY**
6.2	INDUSTRIAL HANDS-ON PRACTICE	INDUSTRIAL TRAINING	-	-	-	12	150*			200**					**350**	
6.3	INDUSTRIAL PROJECT	INDUSTRIAL TRAINING	-	-	-	4	50*			50**					**100**	
6.4	SEMINAR	IN HOUSE	-	-	-	2	-	100	100	-	-	-	-	-	**100**	
Total			**-**	**-**	**-**	**20**									**650**	

NOTE:

1. The Industrial training tenure should not be less than 14 weeks.
2. Industry must be registered with MSME/Directorate of industries/Limited Organization/State/Central Government establishments.
3. Monthly progress reports of Intern/ Trainee should be attested and forwarded by industrial supervisor (allotted to Intern/Trainee) during industrial Internship/Training.
4. The Industrial unit/organisation must evaluate students using the format provided by polytechnic in the form of marks.
5. The Industrial Hands on Practice, Industrial Project and seminar must be evaluated on the basis of the AICTE Internship Policy: Guidelines and procedures (Chapter -9 Procedures / format for organizing internship)
6. "Entrepreneurship and Start-up" course is also mandatory in Industrial internship/training mode. It will be conducted online mode by his/her polytechnic institute. After completing the online course, students must appear for exam conducted by the Board of Technical Education, Lucknow.
7. ***Evaluation by faculty mentor**
   The institute will depute one faculty member for mentoring at least 20-30 students undertaking apprenticeship training. Such mentors will monitor, guide and provide counselling to the students as and when required. Faculty mentor of the institute(s) may make a surprise visit to the internship/apprenticeship site to check the student's presence physically. (The Proforma of the evaluation is attached as the Annexure -1)
8. ** **Evaluation by industry** : The industry shall assess the candidates based on the following parameters attendance, discipline and punctuality, familiarity of tools and material, engineering skills, application of knowledge and problem-solving skills, comprehension and observation, professional ethics, safety and environmental consciousness, communication skills, supervisory skills and general conduct during the period (The Proforma of the evaluation is attached as the Annexure -2)
9. **# Evaluation through seminar presentation/Viva-Voce at the institute :** The student will give a seminar based on his training report, before an expert committee constituted by the concerned department as per norms of the institute. The evaluation will be based on the following criteria:

OPEN ELECTIVE-1

SR.NO.	(Q) THEORY COURSES NAME
1.	ECONOMIC POLICIES IN INDIA (Course offered by Polytechnic Institute)
2.	PROJECT MANAGEMENT (Course offered by Polytechnic Institute)

SR.NO.	**CERTIFICATE COURSES**
1.	COURSES CONDUCTED BY CENTRE OF EXCELLENCE (ESTABLISHED BY THIRD PARTY AS: - TATA TECHNOLOGIES. etc)*Annexure-1
2.	NPTEL
3.	MOOCS THROUGH SWAYAM
4.	AICTE-ELIS AND CENTRALLY FUNDED TECHNICAL INSTITUTES
5.	C-DAC
6.	CERTIFICATIONS CONDUCTED BY THE INSTITUTE OF NATIONAL IMPORTANCE (IIT, NIT, IIIT ETC.)
7.	ISRO E-LEARNING
8.	OTHER RELEVANT GOVERNMENT, INTERNATIONAL/NATIONAL PLATFORMS OF REPUTE NEILIT
9.	CERTIFICATIONS CONDUCTED BY BITRA/NITRA/SITRA/ATIRA/TAI/SASMIRA/WIRA/WSC CERTIFICATE PROGRAMME

OPEN ELECTIVE -2

SR.NO.	(Q) THEORY COURSES NAME
1.	RENEWABLE ENERGY TECHNOLOGIES (Course offered by Polytechnic Institute)
2.	ENERGY EFFICIENCY AND AUDIT (Course offered by Polytechnic Institute)

SR.NO.	**CERTIFICATE COURSES**
1..	COURSES CONDUCTED BY CENTRE OF EXCELLENCE (ESTABLISHED BY THIRD PARTY AS: - TATA TECHNOLOGIES. etc)*Annexure-1
2.	NPTEL
3.	MOOCS THROUGH SWAYAM
4.	AICTE-ELIS AND CENTRALLY FUNDED TECHNICAL INSTITUTES
5.	C-DAC
6.	CERTIFICATIONS CONDUCTED BY THE INSTITUTE OF NATIONAL IMPORTANCE (IIT, NIT, IIIT ETC.)
7.	ISRO E-LEARNING
8.	OTHER RELEVANT GOVERNMENT, INTERNATIONAL/NATIONAL PLATFORMS OF REPUTE NEILIT
9.	CERTIFICATIONS CONDUCTED BY BITRA/NITRA/SITRA/ATIRA/TAI/SASMIRA/WIRA CERTIFICATE PROGRAMME

OPEN ELECTIVE-3

SR.NO.	(Q) THEORY COURSES NAME
1.	ARTIFICIAL INTELLIGENCE (Course offered by Polytechnic Institute)
2.	DISASTER MANAGEMENT (Course offered by Polytechnic Institute)

SR.NO.	**CERTIFICATE COURSES**
1..	COURSES CONDUCTED BY CENTRE OF EXCELLENCE (ESTABLISHED BY THIRD PARTY AS: - TATA TECHNOLOGIES. etc)* Annexure-1
2.	NPTEL
3.	MOOCS THROUGH SWAYAM
4.	AICTE-ELIS AND CENTRALLY FUNDED TECHNICAL INSTITUTES
5.	C-DAC
6.	CERTIFICATIONS CONDUCTED BY THE INSTITUTE OF NATIONAL IMPORTANCE (IIT, NIT, IIIT ETC.)
7.	ISRO E-LEARNING
8.	OTHER RELEVANT GOVERNMENT, INTERNATIONAL/NATIONAL PLATFORMS OF REPUTE NEILIT
9.	CERTIFICATIONS CONDUCTED BY BITRA/NITRA/SITRA/ATIRA/TAI/SASMIRA/WIRA/WSC CERTIFICATE PROGRAMME

ANNEXURE-1

LIST OF COURSES CONDUCTED BY TATA TECHNOLOGIES

1. Fundamentals of Innovation and Design Thinking
2. Product Design and Development
3. Product Verification and Analysis
4. Advanced Automobile
5. Electric Vehicle
6. Internet of Things
7. Advanced Manufacturing
8. Advanced Welding & Painting using Simulator
9. Industrial Automation and MES
10. Industrial Robotics
11. Inspection and Quality Control
12. Advanced Plumbing
13. AI and ML

PROGRAME ELECTIVE-1

SR.NO.	SUBJECT NAME
1.	Fabric Manufacturing Process -I
2.	Technical Textile & Non-Woven Technology

PROGRAME ELECTIVE-2

SR.NO.	SUBJECT NAME
1.	Trend Research & Forecasting.
2.	Knit-Wear Technology

PROGRAME ELECTIVE-3

SR.NO.	SUBJECT NAME
1.	Fabric Manufacturing Process –II
2.	Industrial Safety

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7. DETAILED CONTENTS OF VARIOUS SUBJECTS

THEORY	1.1 TEXTILE MATERIALS	L	T	P
		3	-	-

COURSE OBJECTIVE

The course Textile Material aims to provide fundamental knowledge of natural, regenerated, and manmade textile fibres, their sources, classification, properties, and end uses. It introduces seed, bast, animal, and silk fibres, along with regenerated fibres such as rayon and acetate, and synthetic fibres including nylon, acrylic, and polyester. The objective is to develop a clear understanding of different textile materials and their suitability for various textile applications.

COURSE OUTCOMES (CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following

Students will be able to

CO1 Explain the sources, classification, and utilization of natural and manmade textile fibres, along with their essential and desirable properties.

CO2 Describe the characteristics, properties, and end uses of seed fibres (cotton, kapok) and bast fibres (jute, flax, hemp, ramie).

CO3 Understand the production process of natural silk, including silkworm rearing, and explain the properties and applications of different types of silk.

CO4 Identify various types of wool (merino, mohair, cashmere, camel, alpaca), and explain wool sorting, grading, properties, and end uses.

CO5 Explain the manufacturing, properties, and applications of regenerated fibres such as viscose, acetate, and cuprammonium rayon.

CO6 Describe the characteristics, properties, and end uses of manmade fibres such as nylon, acrylic, and polyester.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	-	-	-	-	-	-	*	*
CO2	3	2	-	-	1	-	-	*	*
CO3	3	2	-	-	-	-	-	*	*
CO4	3	2	2	-	-	-	-	*	*
CO5	3	1	-	-	2	-	-	*	*
CO6	3	1	-	-	2	-	-	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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DETAILED CONTENTS

UNIT-1 **(6 Periods)**

Introduction to world's sources of textile fibers (natural and manmade) and their utilization General classification of fibers. Essential and Desirable properties of Fibers

UNIT-2 **(10 Periods)**

Introduction to Seeds fibers (Cotton, kapok) and bast fibers(Jute Flax, Hemp Ramie), their properties and ends use.

UNIT-3 **(6 Periods)**

Introduction to natural silk. Rearing of silk worm. Properties and uses of various types of silk, their properties and ends use.

UNIT-4 **(6 Periods)**

Introduction to wool-merino Mohair, Kashmere, Camel and alpaca. sorting and grading of wool, their properties and ends use.

UNIT-5 **(8 Periods)**

Introduction to Regenerated fibers such as Rayons - Viscose, Acetate and Cupramonium, their properties and ends use.

UNIT-6 **(6 Periods)**

Introduction to Manmade fibers such as Nylons, Acrylic, Polyester, their properties and ends use

Note: **The student may be exposed to different types of textile manufacturing processes through textile mill visit so that they are able to understand the subject properly.**

INSTRUCTIONAL STRATEGY

Physical Demonstration of various textile fiber instruments.
Visit may be conducted for students to different textile fiber testing laboratories.
Practical's and file preparation.

MEANS OF ASSESSMENT

Assignments and quiz/class tests, mid-semester and end -semester written tests- Actual practical work, exercises and viva-voce- Presentation on the drawing sheets.

RECOMMENDED BOOKS

1. Textile Fibre by Ghol and Valanslk`
2. Yarn to fabric by Peter Schwarz
3. Fibre to fabric by BP Corbman
4. Textile fibers and their processings by KP Hess
5. Elementary Textile by Parul Bhatnagar, Abhishek Publisher, Chandigarh
6. वस्त्र रेशे–उत्पादन विशेषतायें एवं उपयोग& DR. D.B. Shakyawar & Dr. M.K. Singh, Abhishek Publication Chandigarh/ New Delhi.

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7. Textile Fibres –I By Dr. V.A. Shenai
8. H V S Murthy, Textile Fibres- Textile Association Publication 1995.
9. S. P. Mishra, A text book of Fibres Science and technology, New Age International (p) Ltd 2000.
10. Gordon & Cook, Hand Book of Fibres, Vol I & II Merow Publication Ltd
11. W.E. Morton & JWS Hearle, Physical properties of textile fibres, Textile Institute, U.K.
12. Progress in textiles: Science and Technology Vol.-2 by Dr. VK Kothari, IIT Delhi.
13. R.W. Moncrieff, Man-Made Fibres- Heywood Books

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	6	15
2	10	20
3	6	15
4	6	15
5	8	15
6	**6**	**20**
Total	**42**	**100**

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PRACTICUM	1.2 PRINCIPLES OF DESIGN & SKETCHING	L	T	P
		3	-	6

COURSE OBJECTIVE

The course Principles of Design & Sketching aims to develop fundamental understanding of art and design concepts through theoretical study and practical application. It focuses on elements of design such as lines, shapes, colour, and texture, and principles including rhythm, balance, harmony, emphasis, proportion, and gradation. The course builds skills in sketching, colour rendering, motif development, and creative composition using various art materials and techniques. It also enhances students' ability to interpret aesthetic qualities—traditional, modern, abstract, and geometric—while strengthening visual expression, creativity, and design thinking.

COURSE OUTCOMES (CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following

Students will be able to

CO1 Understand the basic concepts of art and design, and differentiate between various types of designs.

CO2 Identify and effectively use different art materials and drawing tools for sketching and design development.

CO3 Analyze and apply elements of design such as lines, dots, and shapes to create expressive and meaningful compositions.

CO4 Apply colour theory, colour schemes, and texture concepts to develop visually balanced and effective design compositions.

CO5 Demonstrate understanding of principles of design such as rhythm, balance, harmony, emphasis, proportion, and gradation in motif creation.

CO6 Create design variations reflecting aesthetic qualities such as traditional, modern, abstract, folk, and geometric styles.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	-	2	-	-	-	2	*	*
CO2	3	2	2	-	-	-	2	*	*
CO3	3	-	2	-	-	-	2	*	*
CO4	3	2	2	-	-	-	2	*	*
CO5	3	2	2	-	2	-	2	*	*
CO6	3	1	2	-	2	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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DETAILED CONTENTS

UNIT-1 INTRODUCTION TO ART AND DESIGN (6 Periods)

Difference between art and design, Type of Designs .

UNIT-2 INTRODUCTION TO ART MATERIALS (6 Periods)

Pencils, Types of colour (Poster, Water, Pencil, etc.), Paper and other materials, Compass and liner, T-squire, Set-squire, Drawing board.

UNIT-3 STUDY OF LINES & DOTS , SHAPES (6 Periods)

Types of lines, Psychological and visual association.

PRACTICAL-

1- Interpretation of single line, lines and using many lines for specific expression, 2 Total number of lines, 3 each with appropriate emotional or psychological expression. **(10 Periods)**

2- Conversion of shapes from natural to geometric and abstract any one natural shape to be converted in 6 different forms of geometrical and abstract. **(10 Periods)**

UNIT-4 STUDY OF COLOURS AND TEXTURE (8 Periods)

Primary, Secondary, Tertiary, Colour wheel , Pigment theory of colour, Monochromatic, Complementary, Analogous, Achromatic, Colour psychology and visual effects. Types of texture, Categories of texture.

PRACTICAL-

1- Drawing colour wheel that includes primary, secondary and tertiary colours. **(10 Periods)**

2- Rendering value scale for value and intensity of each color from the color wheel in the circular chart form, Monochromatic, complementary, split complementary, analogous, achromatic, primary, secondary, tertiary color schemes will be rendered in 2"X2" block. **(15 Periods)**

UNIT-5 STUDY AND UNDERSTANDING OF PRINCIPLES OF DESIGN (10 Periods)

Rhythm, Harmony, Emphasis, Balance, Repetition, Gradation, Radiation, Negative and positive space, Proportion.

PRACTICAL-

1- Organizing these shapes in a given area to create motif. **(15 Periods)**

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UNIT-6 AESTHETIC QUALITIES OF DESIGN ELEMENTS (6 Periods)

Formal qualities (Tradition, Geometric), Expressive qualities (Modern, Realistic), Symbolic qualities (Abstract, Folk)

PRACTICAL-

1- Understanding of various types of design: Traditional. - Modern, realistic, Abstract, Folk, Geometric, Total number of variations at list 6 No

(24 Periods)

NOTE : No examination question from sketching. The aim here is to familiarize the students with various sketching techniques and materials and thereby develop an acumen for sketching through observation of both the natural and man-made environment. Ultimately these sketching techniques shall help to develop the students design ability.

INSTRUCTIONAL STRATEGY

Student should be encouraged to participate in role play and other student centered activities in class room and actively participate in Pencil diagram and sketching exercises. The Student should be encouraged to draw on daily basis, at least 2 sketches of any object/ natural surroundings/ Human sketch/ buildings/ interior sketches in the sketch book

MEANS OF ASSESSMENT

Assignments and quiz/class tests, mid-semester and end-semester written tests– Actual practical work, exercises and viva-voce– Presentation on the drawing sheets–

RECOMMENDED BOOKS

1. "Rendering with Pencil and Ink" by Gill Robert W., Published by Thomos and Hudson, New Delhi
2. "Learning Curves" by Klara Sjolen and Allan Mcdonalds By Perfect Paperback Publishers.
3. "The Complete Book of Drawing" by Barrington Barber By Perfect Paperback Publishers.

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SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time allotted (Periods)	Marks Allotted (%)
1.	6	10
2.	6	10
3.	6	10
4.	8	20
5	10	30
6	6	20
Total	**42**	**100**

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THEORY	1.3 YARN MANUFACTURING PROCESS	L	T	P
		3	-	-

COURSE OBJECTIVE

The course Yarn Manufacturing Process aims to provide fundamental knowledge of the processes involved in converting fibres into carded and combed yarns. It covers the sequence, objectives, and working principles of key spinning processes including blow room, carding, drawing, combing, speed frame, ring frame, winding, doubling, reeling, and open-end spinning. The course also introduces different types of yarns, yarn faults, and yarn numbering systems. The objective is to develop a clear understanding of yarn production techniques, machine operations, and yarn characteristics essential for textile manufacturing.

COURSE OUTCOMES (CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following

Students will be able to

CO1 Understand the overall flow of processes involved in converting fibres into carded and combed yarns and the objectives of each stage.
CO2 Explain the working principles, functions, and importance of blow room and carding in fibre preparation.
CO3 Describe the operation, purpose, and impact on yarn quality of draw frame, combing, and speed frame.
CO4 Understand the working of ring frame, winding, doubling, and reeling processes and their role in yarn formation.
CO5 Explain open-end spinning techniques, including process workflow and resulting yarn properties.
CO6 Identify different types of yarn, their uses, common yarn faults, and corrective measures.
CO7 Understand yarn numbering systems and their significance in production, quality control, and textile applications.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	-	2	-	-	-	2	*	*
CO2	3	2	2	2	-	-	2	*	*
CO3	3	2	2	2	-	-	2	*	*
CO4	3	2	2	2	-	-	2	*	*
CO5	3	2	2	2	-	-	2	*	*
CO6	3	1	2	-	1	-	2	*	*
CO7	3	1	-	-	-	-	2	*	*

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Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

UNIT-1 **(6 Periods)**

Flow chart of the processes involved in the Conversion of fibers into Combed & Carded Yarn and objective of different processes.

UNIT-2 **(8 Periods)**

Brief study and working principles of blow room and carding.

UNIT-3 **(6 Periods)**

Brief description and working of draw frame, combing and speed frame.

UNIT-4 **(6 Periods)**

Brief description and working of ring frame, winding, doubling frame and reeling.

UNIT-5 **(6 Periods)**

Brief introduction of open end Spinning and their properties

UNIT-6 **(6 Periods)**

Types of yarn and their uses . Yarn faults

UNIT-7 **(4 Periods)**

Numbering system of yarns.

INSTRUCTIONAL STRATEGY

The student may be exposed to different types of textile manufacturing processes through textile mill visit so that they are able to understand the subject properly.

MEANS OF ASSESSMENT

Assignments and quiz/class tests, mid-semester and end-semester written tests– Actual practical work, exercises and viva-voce– Presentation on the drawing sheets–

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RECOMMENDED BOOKS

1. A.R. Khare (All Books)
2. P. Venkat Subramaniam
3. W. Klein, The Textile Institute Publication –Manual of Textile Engineering-Short Staple Spinning Series Vol. I to V.
4. 'The Characteristics of Raw Cotton' by P. Lord. The Textile Institute Publication, Manual of Cotton Spinning Vol. II, Part-I.
5. 'Opening and Cleaning' by Shirley. The Textile Institute Publication, Manual of Cotton Spinning Vol. II, Part-II.
6. Carl Lawrence, Fundamentals of Spun Yarn Technology.
7. 'Opening Cleaning and Picking' by Dr. Zoltan S. Szaloki, Institute of Textile Engineering, Virginia.
8. 'Cotton Ginning' Textile Progress, The Textile Institute Publication.
9. Blow-room and Carding- Training Programme conducted by NCUTE, IIT, Delhi.
10. Essential calculations of practical cotton spinning by TK Pattabhiraman.
11. Carding by F.Charanlay. TheTextile Institute publication, Manual of cotton spinning series Vol III
12. Zoltan, S. Szaloky,Drawing, Combing and roving and speed frame, The Institute of Textile Engineering, Verginia.
13. J.H. Black, Draw frame, combing and speed frame, The Textile Institute publication, Manual of cotton spinning Vol-IV Part II.
14. Cotton spinning by ATIRA

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SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time allotted (Periods)	Marks Allotted (%)
1.	6	10
2.	8	20
3.	6	15
4.	6	15
5	6	15
6	6	15
7	4	10
Total	42	100

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THEORY/ PRACTICAL	1.4 COMMUNICATION SKILLS IN ENGLISH	L	T	P
		3	-	2

COURSE OBJECTIVE

Communication Skills play an important role in career development. This lab course aims at actively involving students in various activities to improve their communication skills with an emphasis on developing personality of the students.

COURSE OUTCOMES

CO1: Explain the fundamentals and principles of effective communication and apply appropriate communication tools in professional contexts
CO2: Demonstrate effective listening and speaking skills using appropriate pronunciation and professional soft skills
CO3: Read and interpret professional and technical texts to extract relevant information
CO4: Apply correct grammar and vocabulary in written and spoken communication
CO5: Write clear and grammatically correct professional documents and formal correspondence

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	-	1	-	1	3	*	*
CO2	3	3	-	-	2	3	3	*	*
CO3	3	3	2	-	-	2	3	*	*
CO4	3	2	-	-	2	2	3	*	*
CO5	3	2	2	1	2	2	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)
***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

UNIT -1 COMMUNICATION: THEORY AND PRACTICE (08 Periods)

- Basics of Communication, Definition Process of Communication
- Types of communication (formal and informal, verbal and non-verbal), 7 C's of Communication

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- Barriers to communication and ways to overcome them
- Tools or devices of Communication.

UNIT-2 SOFT SKILLS FOR PROFESSIONAL EXCELLENCE (04 Periods)

- Introduction to Soft skills and hard skills
- Importance of soft skills

UNIT – 3 READING COMPREHENSION: UNSEEN PASSAGES (08 Periods)

- Introduction to Reading Comprehension
- Questions & Answers
- Prefix & Suffix
- Antonyms & Synonyms

UNIT- 4 FUNCTIONAL GRAMMAR (08 Periods)

- **Sentence and its Types**
- **Parts of Speech**
- **Tenses**
- **Active and Passive Voice**
- **Punctuation**

UNIT- 5 PROFESSIONAL WRITING (14 Periods)

- CV Writing, Resume, Covering Letter
- Agenda, Minutes of Meeting
- Notices
- Official Letters: Memo, Circular, Office Orders
- Letter-Reports
- E-mail Drafting

LIST OF PRACTICALS

UNIT-1 LISTENING SKILLS

- Introduction to listening process and practice
- Listening to recorded lectures/speeches/poems/interviews and Dialogues

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UNIT-2 BEGINNING TO EXPRESS

- Introducing Self and Others
- Extempore- Just a minute session
- Scenario and role-based conversations (e.g. Manager and Team; Customer and Salesperson)
- Leave taking

UNIT-3 SPEAKING SKILLS

- Talking about likes and dislikes
- Asking questions-polite responses
- Apologizing & forgiving
- Complaining & Warning

UNIT-4 STEPS TOWARDS FUTURE

- Delivering formal speeches
- Mock Interviews
- Presentation
- Group Discussion

INSTRUCTIONAL STRATEGY

Student should be encouraged to participate in role play and other student centered activities in class room and actively participate in listening exercises

MEANS OF ASSESSMENT

- Assignments and quiz/class tests, mid-semester and end-semester written tests
- Actual practical work, exercises and viva-voce
- Presentation and viva-voce

RECOMMENDED BOOKS

1. Communicating Effectively in English, Book-I by RevathiSrinivas; Abhishek Publications, Chandigarh.
2. Communication Techniques and Skills by R. K. Chadha; DhanpatRai Publications, New Delhi.
3. High School English Grammar and Composition by Wren & Martin; S. Chand & Company Ltd., Delhi.

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4. Excellent General English-R.B.Varshnay, R.K. Bansal, Mittal Book Depot, Malhotra
5. The Functional aspects of Communication Skills – Dr. P. Prsad, S.K. Katria& Sons, New Delhi
6. Q. Skills for success – Level & Margaret Books, Oxford University Press.
7. E-books/e-tools/relevant software to be used as recommended by AICTE/UPBTE/NITTTR.
8. English for Communication (text Book Published by IRDT, Kanpur 1998).

WEBSITES FOR REFERENCE:

1. http://www.mindtools.com/ page 8.html – 99k
2. http://www.letstalk.com.in
3. http://www.englishlearning.com
4. http://learnenglish.britishcouncil.org/en/
5. http://swayam.gov.in

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Time Allotted (Periods)	Marks Allotted (%)
1	8	20
2	4	10
3	8	20
4	8	20
5	14	30
Total	**42**	**100**

PRACTICAL	1.5 TEXTILE MATERIALS	L	T	P
		-	-	6

COURSE OBJECTIVE

The practical course Textile Material is designed to develop hands-on skills in the identification, analysis, and characterization of various natural, regenerated, and synthetic fibres. Students will study fibres such as cotton, wool, silk, jute, linen, polyester, acrylic, viscose, and nylon through visual inspection, feel, burning tests, microscopic examination, and chemical analysis. The objective is to build practical understanding of fibre morphology, physical and chemical properties, and behaviour, enabling accurate fibre identification and informed selection for textile applications.

COURSE OUTCOMES (CO):

The experiment should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following
Students will be able to

CO1 □ Identify and differentiate various natural, regenerated, and synthetic textile fibres through visual inspection and feel.
CO2 □ Examine the longitudinal and cross-sectional structure of fibres using microscopic techniques.
CO3□ Analyze the burning behavior and chemical properties of different textile fibres.
CO4 □ Compare physical, chemical, and aesthetic characteristics of fibres to understand their performance and applications.
CO5 □ Develop practical skills to accurately classify and select fibres for textile processing and end-use purposes.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	-	-	-	2	-	2	*	*
CO2	3	2	-	3	2	-	2	*	*
CO3	3	2	-	2	2	-	2	*	*
CO4	3	2	-	2	2	-	2	*	*
CO5	3	2	-	2	2	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

* PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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LIST OF PRACTICALS

Inspection and Identification of various types of textile materials covered in the subject. All experiments to be done with respect to below listed fibers

1	Cotton	**(9 Periods)**
2	Wool	**(9 Periods)**
3	Silk	**(9 Periods)**
4	Jute	**(9 Periods)**
5	Linen	**(9 Periods)**
6	Polyester	**(9 Periods)**
7	Acrylic	**(10 Periods)**
8	Viscose	**(10 Periods)**
9	Nylon	**(10 Periods)**

To Study feel & appearance of textile fibers To study burning behavior of Textile Fibers To observe various fibers under microscope and study to longitudinal and cross sectional view Chemical analysis of textile fibers.

RECOMMENDED BOOKS-

1. H V S Murthy, Textile Fibres- Textile Association Publication 1995.
2. R.W. Moncrieff, Man-Made Fibres- Heywood Books
3. Textile Fibre by ATIRA
4. Textile Fibre by VA Shenai

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PRACTICAL	1.6 SPORTS AND YOGA	L	T	P
		0	0	2

COURSE OBJECTIVE

To make the students understand the importance of sound health and fitness principles as they relate to better health. To expose the students to a variety of physical and yogic activities aimed at stimulating their continued inquiry about Yoga, physical education, health and fitness. To create a safe, progressive, methodical and efficient activity based plan to enhance improvement and minimize risk of injury .To develop among students an appreciation of physical activity as a lifetime pursuit and a means to better health.

COURSE OUTCOMES (CO):

The experiment should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following

Students will be able to

CO1 Understand the fundamentals of physical education, fitness, wellness, and the principles, objectives, and scope of yoga.

CO2 Demonstrate practical knowledge and benefits of various yogic practices, including asanas, pranayamas, meditation, bandhas, and yogic exercises for health and immunity.

CO3 Apply knowledge of anatomy, physiology, and body systems to analyze the effects of physical exercises and yoga on overall health and performance.

CO4 Develop skills in planning, training, warming-up, and limbering down for sports activities while understanding postures, injury prevention, and first aid.

CO5 Understand sports psychology, motivation, and the role of mental wellness in physical education, sports, and yoga.

CO6 Gain knowledge of the Olympic movement, major awards and honors in sports, and demonstrate practical skills and rules of selected sports or games of choice.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	1	1	2	-	2	*	*
CO2	3	3	2	2	2	-	2	*	*
CO3	3	3	2	3	2	-	2	*	*
CO4	3	3	3	3	2	-	2	*	*
CO5	3	2	2	2	2	-	2	*	*
CO6	3	2	2	2	2	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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COURSE CONTENT

1 Introduction to Physical Education

- Meaning & definition of Physical Education
- Aims & Objectives of Physical Education

2 Yoga

- Meaning & Importance of Yoga
- Elements of Yoga- Gyan Yoga, Bhakti Yoga, Karm Yoga, Hathyoga, Astang Yoga .Introduction - Asans, Pranayama, Meditation & Bandh , Mudra and shat Karm .
- Meaning of Practice of various Yogic Sukhasan, Vyayams
- Practice of Asans and Benefits – Sidhasana, Padmasana,Vajrasana, Shasakasan, Singhasan, Go-mukhasan, Virasan, Dhanurasan, Matsnyendrasan, Gorakhasan, Paschimottansan, Mayurasan, Garunasan, Pawanmuktasan, Kurmasan, Mandukasan, Shalabhasan, Makrasan, Bhujangasan, Naukasan, Shavasan, Sharvangasans, Halasan.
- Practice and Benefits of Pranayamas – Anulom- Vilom, Surya Bhedhi, Ujjayi, Sheetkari, Bhastrika, Bharamri, Murchha, kewali etc .
- Practice of Meditation – Meaning of Meditation, Types , Techniques, Benefits .

3 Olympic Movement

- Olympic Symbols, Ideals, Objectives & Values
- Awards and Honours in the field of Sports in India (Dronacharya Award, Arjuna Award,
- Dhayanchand Award, Rajiv Gandhi Khel Ratna Award etc.)

4 Physical Fitness, Wellness & Lifestyle

- Meaning & Importance of Physical Fitness & Wellness
- Components of Physical fitness
- Concept of Positive Lifestyle

5 Yoga & Lifestyle

- Ideal life style
- Asans and pranayams a preventive measures
- Yoga and Immunity
- Concept of Yogic diet.

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- **Life Style Diseases-** Yoga management of Diseases, Yoga management of Stress, Yoga management of Obesity, Yoga management of High Blood Pressure, Yoga management of Insomia, Yoga management of Asthma, Yoga management of Joints Pains, Yoga management of Digestive Disorders .

6 Fundamentals of Anatomy & Physiology in Physical Education, Sports and Yoga

- Define Anatomy, Physiology & Its Importance
- Effect of exercise on the functioning of Various Body Systems.
- Circulatory System,
- Respiratory System,

7 Postures

- Meaning and Concept of Postures.
- Causes of Bad Posture.
- Advantages & disadvantages of weight training.

8 Training and Planning in Sports

- Meaning of Training
- Warming up and limbering down

9 Psychology & Sports

- Definition & Importance of Psychology in Physical Edu. & Sports
- Define & Differentiate Between Growth & Development

10 Doping

- Meaning and Concept of Doping

11 Sports Medicine

- First Aid – Definition, Aims & Objectives.
- Sports injuries: Classification, Causes & Prevention.

12 Sports / Games

Following sub topics related to any one Game/Sport of choice of student out of: Athletics, Badminton, Basketball, Chess, Cricket, Kabaddi, Lawn Tennis, Swimming, Table Tennis, Volleyball, Yoga etc.

- History of the Game/Sport.
- Specifications of Play Fields and Related Sports Equipment.
- Important Tournaments and Venues.

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RECOMMENDED BOOKS-

1. Modern Trends and Physical Education by Prof. Ajmer Singh.
2. Light On Yoga By B.K.S. Iyengar.
3. Health and Physical Education – NCERT (11th and 12th Classes)

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THEORY	2.1 TEXTILE COLOURATION	L	T	P
		4	-	-

COURSE OBJECTIVE

The course Textile Colouration aims to provide a clear understanding of the principles, processes, and techniques involved in dyeing textile fibres and fabrics. It covers preparatory treatments like singeing, scouring, bleaching, and designing for cotton, wool, and silk, as well as the classification and methods of dyeing. Students will learn dyeing techniques for natural and synthetic fibres using various dyes, the role of textile auxiliaries, and operation of modern dyeing machines. The course also introduces colour fastness, factors affecting it, and methods to overcome challenges in dyeing synthetic fibres. The objective is to equip students with the knowledge and skills necessary for effective and efficient textile colouration in industrial applications.

COURSE OUTCOMES (CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following

Students will be able to

CO1 □ Understand preparatory processes such as singeing, scouring, bleaching, and designing for cotton, wool, and silk.

CO2 □ Explain the principles, classification, and methods of dyeing textile fibres.

CO3□ Apply appropriate dyeing techniques for natural fibres (cotton, wool, silk) using direct, reactive, acid, and manmade dyes.

CO4 □ Understand dyeing of synthetic fibres like polyester using disperse dyes and the role of textile auxiliaries

CO5 □ Identify and operate different types of dyeing machines, including jigger, padding mangle, winch, infrared, jet, and HTHP machines.

CO6 □ Analyze factors affecting colour fastness and apply methods to evaluate and improve fastness properties of dyed textiles.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	-	-	-	1	-	2	*	*
CO2	3	2	-	3	1	-	2	*	*
CO3	3	2	-	2	1	-	2	*	*
CO4	3	2	-	2	1	-	2	*	*
CO5	3	2	-	2	1	-	2	*	*
CO6	3	2	-	2	1	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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COURSE CONTENT

UNIT-1 **(10 Periods)**

Preparatory processes, Singeing, designing, scouring and bleaching for cotton, wool and silk.

UNIT-2 **(10 Periods)**

Definition of Dyeing, methods of dyeing. Classification of dyes according to application.

UNIT-3 **(10 Periods)**

Common methods of dyeing cotton with direct, Reactive, vat, and napthol colours, wool and Silk dyeing with acid and manmade colours polyester by disperse, use of assistant & textile auxiliaries in dyeing.

UNIT-4 **(10 Periods)**

Introduction to different dyeing machines like Jiggar, Padding mangle winch, infrared dyeing machine, Jet dying & HTHP.

UNIT-5 **(10 Periods)**

Brief study on the necessity and use of optical whitening agents.Difficulties in dyeing synthetic fibres by the common methods and ways of overcoming them.

UNIT-6 **(06 Periods)**

Introduciton to different colour fastness(Light, Washing, Persperisation, Rubbing) and Factors affecting colour fastness.

INSTRUCTIONAL STRATEGY

Student should be encouraged to participate in role play and other student centred activities in class room and actively participate in listening exercises

MEANS OF ASSESSMENT

- Assignments and quiz/class tests, mid-semester and end-semester written tests
- Actual practical work, exercises and viva-voce
- Presentation and viva-voce

RECOMMENDED BOOKS

1. Chemical processing of synthetic fibres and blends by Datye & Vaidya
2. Technology of bleaching Vol. 3 by V A Shenai
3. Textile scouring and bleaching by ER Trotman
4. Bleaching and mercerization by JT Marsh
5. Chemical processing of cotton and p/c blends - ATIRA
6. A glimpse on the chemical technology and textile fibres by RR Chakraborty
7. Technology of Dyeing by VA Shenai
8. Chemical technology of fibrous material by F. Shadov
9. Fundamentals and practices in colouration of textiles by J.N. Chakraborty

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SUGGESTED DISTRIBUTION OF MARKS9

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	10	18
2	10	18
3	10	18
4	10	18
5	10	18
6	06	10
Total	**56**	**100**

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PRACTICAL	2.2 TEXTILE COLOURATION	L	T	P
		-	-	6

COURSE OBJECTIVE

The practical course Textile Colouration is designed to develop hands-on skills in fabric preparation and dyeing techniques for natural and synthetic fibres. Students will perform preparatory processes such as desizing, scouring, and bleaching, and apply dyeing methods for cotton, wool, silk, acrylic, and polyester using various dyes. The objective is to provide practical knowledge of dye-fibre interaction, colour application, and process control, enabling students to achieve uniform, high-quality, and colour-fast results suitable for textile applications.

COURSE OUTCOMES (CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following
Students will be able to

CO1 Perform preparatory processes like desizing, scouring, and bleaching of cotton fabrics.
CO2 Apply dyeing techniques on cotton fabrics using direct, reactive, and vat dyes.
CO3 Carry out dyeing of protein fibres such as wool and silk using appropriate dyes.
CO4 Perform dyeing of synthetic fibres like acrylic and polyester with suitable dyes and auxiliaries.
CO5 Develop practical skills to achieve uniform colour application and evaluate colour-fastness and quality of dyed fabrics.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	-	3	1	-	2	*	*
CO2	3	2	-	3	1	-	2	*	*
CO3	3	2	-	2	1	-	2	*	*
CO4	3	2	-	2	1	-	2	*	*
CO5	3	2	2	2	1	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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LIST OF PRACTICALS

1. Desizing, scouring, and bleaching of cotton fabrics. **(20 Periods)**
2. Dyeing of cotton with direct, reactive, vat dyes. **(15 Periods)**
3. Dyeing of wool with acid dye. **(15 Periods)**
4. Dyeing of silk **(10 Periods)**
5. Dyeing of acrylic **(10 Periods)**
6. Dyeing of polyester with disperse dye **(14 Periods)**

RECOMMENDED BOOKS

1. Chemical processing of synthetic fibers and blends by Datye & Vaidya
2. Technology of bleaching Vol. 3 by V A Shenai
3. Textile scouring and bleaching by ER Trotman
4. Bleaching and mercerization by JT Marsh
5. Chemical processing of cotton and p/c blends - ATIRA
6. A glimpse on the chemical technology and textile fibres by RR Chakraborty
7. Technology of Dyeing by VA Shenai
8. Chemical technology of fibrous material by F. Shadov
9. Fundamentals and practices in colouration of textiles by J.N. Chakrabort

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PRACTICUM	2.3 INDIAN TRADITIONAL DESIGN	L	T	P
		3	-	6

COURSE OBJECTIVE

The practicum Indian Traditional Design aims to provide students with hands-on understanding of India's rich textile heritage, including historical significance, construction techniques, motifs, colours, and regional styles. Students will study and practice iconic traditional textiles such as Phulkari, Bandhani, Kashmiri embroidery, Banarasi brocades, Chikankari, Jamdani, Kalamkari, Chanderi, Patola, and Baluchar. The objective is to develop practical skills in traditional design creation, embroidery, and weaving techniques, fostering appreciation for cultural craftsmanship while enabling students to apply these skills in contemporary textile design and applications.

COURSE OUTCOMES (CO):

The theory and experiment should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following

Students will be able to

CO1 Understand the historical significance, regional styles, motifs, and colour schemes of traditional Indian textiles..

CO2 Demonstrate practical skills in creating traditional designs and executing embroidery and weaving techniques such as Phulkari, Bandhani, Chikankari, Kalamkari, Banarasi brocades, Jamdani, Chanderi, Patola, and Baluchar.

CO3 Apply knowledge of traditional Indian textile design in contemporary design projects, preserving cultural aesthetics while innovating for modern applications.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	-	-	-	1	-	2	*	*
CO2	3	2	3	2	1	-	2	*	*
CO3	3	2	3	2	1	1	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

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COURSE CONTENT

UNIT-1 INTRODUCTION TO INDIAN WOVEN TEXTILE (8Periods)

Historical significance, Construction techniques, Styles,Colours and Motifs, Centers of production.

UNIT-2 DYEING AND PRINTING IN INDIA : (8 Periods)

Historical significance, Construction techniques, Styles, Colours and Motifs, Centers of production.

UNIT-3 The following topics should be covered in History of Textile. (26 Periods)

1	**Phulkari**	6	**Bandhani**
2	**Kashmir embroidary**	7	**Banarasi Brocades**
3	**Chickankari**	8	**Jamdani**
4	**Kalamkari**	9	**Chanderi**
5	**Patola**	10	**Baluchar**

PRACTICALS – **(84 Periods)**

1	**Phulkari**	6	**Bandhani**
2	**Kashmir embroidary**	7	**Banarasi Brocades**
3	**Chickankari**	8	**Jamdani**
4	**Kalamkari**	9	**Chanderi**
5	**Patola**	10	**Baluchar**

INSTRUCTIONAL STRATEGY

Students should be taken for field visits to various production centres to show the samples of the above mentioned textiles (embroidered, woven, printed and dyed) They may also be taken for field visits to various places like art galleries/ museums/religious places Practically execute any one of the traditional designs in the contemporary form and prepare a file with replica or samples of the given

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MEANS OF ASSESSMENT

Assignments and quiz/class tests, mid-semester and end-semester written tests– Actual practical work, exercises and viva-voce– Presentation on the drawing sheets–

RECOMMENDED BOOKS

1. Folk Embroidery of Himachal Pradesh by Subhashini Aryan
2. Ikat Textile of India by Chetna Desai
3. Indian Painted Textiles by Kamla Dev Chattopadya
4. Carpets of India by Marq
5. Fabric Art heritage of India by Sukla Das
6. Hand Woven Fabric of India by Jasleen Dhamija
7. Indian Sari by Kamla Dev Chattapodya
8. Tie Dyed Textile of India by veronica Muarphy
9. Hand Woven Fabrics of India by Jasleen Dhamija
10. Traditional Indian Textiles by John Gillow
11. Textile Art of India by Kyoto Shoin
12. Hand Painting Textile For the Home by Kaszz Ball and Valcrie
13. Tie Dyed Textiles of India by Murphyd Crill
14. Masterpieces of Indian Textile by Rustam J Mehta
15. Kashmir Shawls by All India Handicrafts Board
16. Everything you ever wanted to know about Fabric Painting by Jill Kennedy And Jane Vourell
17. Saries of India – RTZ and Singh
18. Saries of Madhya Pradesh
19. Embroidered Textiles of India, Calico Masam of India
20. Painted Textiles of India, Calico Masam of India
21. Printed Textiles of India, Calico Masam of India
22. Woven Textile of India. Calico Masam of India
23. Costumes and Textiles of India by Parul Bhatnagar; Abhishek Publisher, Chandigarh

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SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time allotted (Periods)	Marks Allotted (%)
1.	8	20
2.	8	20
3.	26	60
Total	**42**	**100**

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THEORY/PRACTICAL	2.4 INTRODUCTION TO IT AND AI	L	T	P
		2	-	4

COURSE OBJECTIVE

Information technology has great influence on all aspects of life. Primary purpose of using computer is to make the life easier. Almost all work places and living environment are being computerized. The subject introduces the fundamentals of computer system for using various hardware and software components. In order to prepare diploma holders to work in these environments, it is essential that they are exposed to various aspects of information technology such as understanding the concept of information technology and its scope; operating a computer; use of various tools using MS Office/Open Office/Libre Office using internet etc., form the broad competency profile of diploma holders. This exposure will enable the students to enter their professions with confidence, live in a harmonious way and contribute to the productivity.

COURSE OUTCOMES (CO):

After undergoing the subject, the students will be able to:

CO1: Explain the basic concepts of computers, their generations, components, memory types, and commonly used input and output devices.

CO2: Demonstrate the use of operating systems and application software including document creation, spread-sheets, presentations, and basic system utilities.

CO3: Describe the fundamentals of computer networking and the Internet, including network types, connecting devices, IP addressing, and web-based services such as email and search engines.

CO4: Identify information security principles and cyber threats, and explain basic protection mechanisms, cyber security practices, and relevant cyber laws.

CO5: Explain the fundamentals of Artificial Intelligence, including types of AI, differences between AI, Machine Learning, and Deep Learning, and demonstrate basic interaction with AI tools using prompt engineering

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	1	-	2	-	-	1	*	*
CO2	2	1	1	3	-	1	2	*	*
CO3	2	2	1	2	1	-	2	*	*
CO4	2	2	1	1	2	-	2	*	*
CO5	2	2	2	3	1	1	3	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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COURSE CONTENTS

1. INTRODUCTION TO COMPUTERS AND PERIPHERALS (5 Periods)

Introduction, Computer Generations, Components of Computer, Types of Computers, CPU, Memory & its types, Input & Output devices, Printer, Scanner, Modem, Sound Cards, CMOS battery, Sharing of Printers.

2. OPERATING SYSTEM AND APPLICATION SOFTWARE (6 Periods)

System Software, Application Software, Utility Software, MS Office/Open Office/Office 365: Creation of document, Spreadsheets and Presentation, working with windows OS, Desktop components, Menu bars, Creating shortcut of program. Google Suits (Google drive, google sheet, google doc, google presentation), Installation of Application software's, Antivirus and Drivers.

3. INTERNET (6 Periods)

Network topologies, Basics of Networking, – LAN, MAN, WAN, Connecting Devices (Bridge, Switch, Router, Gateway), Wi-Fi technologies, Concept of IP Address, DNS, Search Engines, e- mail, Web Browsing.

4. BASICS OF INFORMATION SECURITY (5 Periods)

Introduction to security, CIA Triads, Security threats: Virus, Worms, Malware, Trojon Horse, Detection and prevention, Types of Attacks: Active Passive attacks, Cyber Security & Frauds, Access control Biometrics, Indian Cyber laws.

5. FUNDAMENTALS AND APPLICATIONS OF ARTIFICIAL INTELLIGENCE: (6 Periods)

Definition and scope of AI, History and evolution of AI, Types of AI (Narrow AI, General AI, Super AI), Difference among AI, Machine Learning and Deep Learning, Basic Introduction to Popular Tools: ChatGPT, Gemini and other text, audio and video generator tools. The basics of talking to AI: Prompt Engineering, Introduction to Heuristic Search Techniques (Uninformed and Informed search).

Applications and use cases of AI: AI in healthcare, AI in finance, AI in agriculture, AI in education, AI in cyber security etc.

LIST OF PRACTICAL

1. Identify various components, peripherals of computer and list their functions.
2. Installation of operating system. (windows/linux/others)
3. Installation of various application software and peripheral drivers.
4. Creation and Management of files and folders (Rename, delete, search)
5. Installation of Antivirus and remove virus.
6. Scanning and printing documents.
7. Browsing, Downloading, Information using Internet.
8. E-Mail ID creation, composing, sending and receiving e-mail. Attaching a file with e-mail message.
9. Word Processing (MS Office/Open Office) File Management, Editing documents, Mail Merge, Security etc.
10. Spread Sheet Processing (MS Office/Open office/LibreOffice) Addition, deletion, formulation, Security etc.
11. PowerPoint Presentation (MS Office/Open Office/Libre Office) Preparing Slides, cus-

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tomization, animation, Security etc.

12. Google Suite.
13. Working on Power point presentation, spreadsheet, document preparation using AI tools.
14. Working on Text, Audio and Video using AI tools.
15. Generating different documents by using AI prompts.

INSTRUCTIONAL STRATEGY

Since this subject is practice oriented, the teacher should demonstrate the capabilities of computers to students while doing practical exercises. The students should be made familiar with computer parts, peripherals, connections and proficient in making use of MS Office/Open Office/Libre office/Google Suit in addition to working on internet. The student should be made capable of working on computers independently.

MEANS OF ASSESSMENT

- Class Tests/Quiz
- Software Installation and Use
- Viva-Voce
- Presentation

RECOMMENDED BOOKS

1. Fundamentals of Computer by V Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi
2. Information Technology for Management by Henery Lucas, Tata McGraw Hills, New Delhi
3. Computers Fundamentals Architecture and Organisation by B Ram, revised Edition, New Age International Publishers, New Delhi
4. Computers Today by SK Basandara, Galgotia publication Pvt Ltd. Daryaganj, New Delhi.
5. Internet for Every One by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi.
6. A First Course in Computer by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
7. Computer Fundamentals by PK Sinha; BPB Publication, New Delhi
8. Fundamentals of Information Technology by Leon and Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
9. On Your Marks - Net…Set…Go… Surviving in an e-world by AnushkaWirasinha, Prentice Hall of India Pvt. Ltd., New Delhi
10. Fundamentals of Information Technology by Vipin Arora, Eagle Parkashan, Jalandhar

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REFERENCE WEBSITES

1. www.sf.net
2. Gsuite.google.com
3. Spoken-tutorial.org
4. Swayam.gov.in

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	5	18
2	6	21
3	6	18
4	5	21
5	6	22
Total	**28**	**100**

PRACTICAL	2.5 DRAWING, RENDERING & STUDY OF OBJECTS	L	T	P
		-	-	6

COURSE OBJECTIVE

The practical course Drawing, Rendering & Study of Objects aims to develop students' skills in sketching, drawing, and rendering using a variety of media including pencil, charcoal, pen and ink, brush, watercolour, pastels, and mixed media. It focuses on observing and accurately representing objects such as flowers, vegetables, creepers, feathers, sea animals, and other animals, while exploring form, perspective, illusion, and three-dimensional effects. The objective is to enhance artistic expression, understanding of composition, and the ability to create visually appealing and technically accurate motifs and designs suitable for applied art and textile applications.

COURSE OUTCOMES (CO):

The experiment should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following
Students will be able to

CO1 □ Understand and apply basic sketching and drawing techniques using various media, both in black-and-white and colour.
CO2 □ Observe and accurately study objects such as flowers, vegetables, creepers, feathers, and animals, translating them into detailed drawings.
CO3 □ Develop skills in creating three-dimensional effects, perspective, and illusion in compositions.
CO4 □ Design and compose motifs and artistic layouts using watercolour, poster colours, and mixed media with attention to form, balance, and visual appeal.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	-	2	3	1	-	2	*	*
CO2	3	2	2	3	1	-	2	*	*
CO3	3	2	3	3	1	-	2	*	*
CO4	3	2	3	3	1	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

LIST OF PRACTICALS

UNIT-1 INTRODUCTION TO SKETCHING (12 Periods)

UNIT-2 INTRODUCTION TO DRAWING (12 Periods)

UNIT-3 STUDY OF OBJECTS (12 Periods)

Handling of different media in black and white and also in color i.e pencil, charcoal, pen and ink, brush and ink, water color, pastels and mixed media.

UNIT-4 STUDY OF THE FOLLOWING : **(48 Periods)**

1 Flower heads.
2 Vegetables with green leaves.
3 Creepers with flowers.
4 Feathers.
5 Sea animals,
6 Animals

Students will make various motifs with colour pictures on given suggested themes.
Understanding of basic shapes in perspective, concept of illusion in art expression, three dimensional effect.
Composition of any three forms from Design Point of View with Water and Poster Colours, on 1/4, imp, sheets.

Note:

1. Students should be taken out for field visits, museums, exhibitions, market, etc for clarifying the concepts and principles of this course as per requirement.
2. There will be only a practical paper in this subject. The knowledge attained by students regarding related theory for practical exercises will be evaluated in the form of viva-voce during practical examinations.

RECOMMENDED BOOKS

1. How to draw and paint by A Walter foster; published by E.D. Galgotia and sons.
2. Flowers and still life by A Walter foster; published by E.D. Galgotia and sons.
3. How to draw and paint textures of animals by A Walter foster; published By E.D. Galgotia and sons.

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AUDIT COURES	2.6 ENVIRONMENTAL SCIENCE	L	T	P
		3	-	-

COURSE OBJECTIVE

A diploma holder must have knowledge of different types of pollution caused due to industries and constructional activities so that he may help in balancing the ecosystem and controlling pollution by various control measures. He should also be aware of environmental laws related to the control of pollution. He should know how to manage the waste. He should know the concept of hazards and disaster management.

COURSE OUTCOMES (CO):

After undergoing the subject, the student will be able to:
CO1: Define the ecosystem and terminology and solve various engineering problems applying ecosystem knowledge to produce eco-friendly products.
CO2: Analyze the suitable extent of air and noise pollution and its control measures and acts.
CO3: Identify the effect of water and soil pollution and its control measures and acts.
CO4: Students will be able to understand the causes, classification, and major natural disasters in India—including earthquakes, tsunamis, floods, droughts, landslides, and thunderstorms with lightning—and their associated hazards.
CO5: Students will be able to understand disaster management frameworks, policies, institutions, and response mechanisms in India, and analyze real-world disaster management case studies.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	3	3	2	3	3	2	*	*
CO2	3	2	2	2	3	2	2	*	*
CO3	3	2	3	2	3	2	2	*	*
CO4	3	2	3	2	3	2	2	*	*
CO5	3	3	3	1	3	3	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

COURSE CONTENT

1. INTRODUCTION (06 Periods)

Basics of ecology, eco system- concept, and sustainable development, Resources renewable and non-renewable. Global Warming, Climate change and its impact ,Green House Effect, Acid Rain, Concept of Green Building, Ground water management.

2. AIR POLLUTION AND NOISE POLLUTION (08 Periods)

Source of air pollution. Effect of air pollution on human health, economy, plant, animals. Air Pollution Control Methods. Introduction to Air Pollution and its Prevention and Control Act 1981 & Environmental Protection Act 1986 and Function of State pollution control board and National Green Tribunal (NGT).

Source of noise pollution, Unit of noise, Effect of noise pollution, Acceptable noise level, Different method of minimize noise pollution.

3. WATER POLLUTION AND SOIL POLLUTION (11 Periods)

Impurities in water, Cause of water pollution, Source of water pollution. Effect of water pollutionon human health, Turbidity, pH, total suspended solids, total dissolved solids,

Concept of dissolved O2, BOD, COD. Prevention of water pollution. Introduction to Water (Prevention and Control of Pollution) Act 1974.Concept of rain water harvesting system.

Sources of soil pollution, Types of Solid waste- House hold, Hospital, From Agriculture, Biomedical, Animal waste and human waste, sediments and E-waste, Plastic Waste . Effect of Solid waste, Disposal of Solid Waste- Solid Waste Management.

4. DISASTER CAUSES AND HAZARDS (6 Periods)

Introduction, Classification of Natural Disasters, Classification of Natural Disasters in India

- Earthquake
- Tsunami
- Flood
- Drought
- Land Slide
- Thunderstorm and Lightening

5. DISASTER MANAGEMENT (11 Periods)

5.1 **Framework**

- Yokohama Strategy for a Safer World (1999)
- The Hyogo Framework for Action (HFA) (2005-2015)
- Sendai Framework for Action (SDGS) (2015-2030)

5.2 **DISASTER MANAGEMENT, PREPAREDNESS AND RESPONSE IN INDIA**

- National Disaster Management Authority (NDMA) Guidelines
- National Policy on Disaster Management (2009)

- National Disaster Management Act (2005)
- NDRF (National Disaster Response Force), SDRF (State Disaster Response Force), DDRF (District Disaster Response Force), and Aapda Mitra.
- Case studies of disaster management efforts: COVID-19 Pandemic, Earthquakes, Firefighting, Thunder Storm, and Lightning.

INSTRUCTIONAL STRATEGY

In addition to theoretical instructions, different activities pertaining to Environmental Studies like expert lectures, seminars, visits to green house, effluent treatment plant of any industry, rain water harvesting plant etc. may also be organized.

MEANS OF ASSESSMENT

- Assignments and quiz/class tests,
- Mid-term and end-term written tests

RECOMMENDED BOOKS –

1. Environmental and Pollution Awareness by Sharma BR; Satya Prakashan, New Delhi.
2. Environmental Protection Law and Policy in India by Thakur Kailash; Deep and DeepPublications, New Delhi.
3. Environmental Pollution by Dr. RK Khitoliya; S Chand Publishing, New Delhi
4. Environmental Science by Deswal and Deswal; DhanpatRai and Co. (P) Ltd. Delhi.
5. Engineering Chemistry by Jain and Jain; Dhanpat Rai and Co. (P) Ltd. Delhi.
6. Environmental Studies by ErachBharucha; University Press (India) Private Ltd., Hyderabad.
7. Environmental Engineering and Management by Suresh K Dhamija; S K Katariaand Sons,New Delhi.
8. E-books/e-tools/relevant software to be used as recommended by AICTE/BTE/NITTTR,Chandigarh.
9. Disaster Management Second Edition AICTE Recommended by S C Sharma, Khanna Publishers
10. Bharat Bhautik Paryavaran Class 11, By NCERT.
11. Apda Avem Apda Prabhandhan | आपदा और आपदा प्रबंधन | Mahesh Kumar Barnwal | CosmosPublication.
12. S.C. Sharma & M.P. Poonia, Environmental Studies, Khanna publishing House, New Delhi

WEBSITES FOR REFERENCE:

- http://swayam.gov.in
- https://www.amazon.in/Prabhandhan
- https://ncert.nic.in/textbook.php?khgy1=0-6
- https://rb.gy/yergl

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	6	15
2	8	20
3	11	25
4	6	15
5	11	25
Total	**42**	**100**

THEORY	3.1 TEXTILE PRINTING & FINISHING	L	T	P
		3	-	-

COURSE OBJECTIVE

The course Textile Printing & Finishing equips students with essential knowledge of fabric preparation, printing techniques, and finishing processes. It covers traditional and modern printing methods, printing paste composition, auxiliaries, printing on wool and silk, after-treatments, defect remedies, digital printing, and key finishing processes like calendering, milling, and sanforizing. The objective is to develop practical and theoretical skills for producing high-quality printed and finished textiles efficiently.

COURSE OUTCOMES (CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following

Students will be able to

CO1 Understand fabric preparation methods for printing and the principles of traditional and modern printing techniques.

CO2 Differentiate between styles of printing such as direct, resist, and discharge, and evaluate their applications, advantages, and limitations.

CO3 Prepare printing pastes and apply knowledge of thickening agents, solvents, binders, and chemical auxiliaries in textile printing.

CO4 Apply printing techniques on wool and silk, including pre-treatment like chlorination, to achieve desired design effects.

CO5 Perform after-treatment processes such as steaming, curing, ageing, soaping, and washing, and identify and correct common printing defects.

CO6 Understand digital printing methods and key textile finishing techniques including calendering, milling, and sanforizing for improved fabric quality.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	-	2	2	-	-	2	*	*
CO2	3	2	2	2	-	-	2	*	*
CO3	3	2	2	2	-	-	2	*	*
CO4	3	2	3	3	1	-	2	*	*
CO5	3	2	3	3	1	-	2	*	*
CO6	3	2	3	3	1	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

UNIT-1 **(07 Periods)**

Preparation of cloth for printing. Printing methods-Block, Screen, Stencil (or spray) and Transfer. Limitations as well as advantages of different printing methods

UNIT-2 **(07 Periods)**

Style of Printing with examples-Resist, Discharge and Direct. Limitations as well as advantages of different style of printing.

UNIT-3 **(07 Periods)**

Composition of printing paste. Classification of thickening agents, preparation of thickening paste. Solvents, Hygroscopic agents, Alkalis, Oxidising and reducing agents and binders.

UNIT-4 **(07 Periods)**

Brief study of wool and silk printing (use of Chlorination Prior to printing).

UNIT-5 **(07 Periods)**

After treatments : such as steaming, curing, ageing, Soaping and Washing. Various defects in Printing and their remedies.

UNIT-6 **(07 Periods)**

Introduction to digital printing and their pre and post finishing treatments.
Introduction to textile finishing i.e. calendering, milling, sonforizing.

INSTRUCTIONAL STRATEGY

Student should be encouraged to participate in role play and other student centred activities in class room and actively participate in listening exercises

MEANS OF ASSESSMENT

- Assignments and quiz/class tests, mid-semester and end-semester written tests
- Actual practical work, exercises and viva-voce
- Presentation and viva-voce

RECOMMENDED BOOKS

1. Textile printing by Leslie W.C. Miles
2. Pretreatment of textile materials for dyeing and printing by Dr.M.S.Parmar published by NITRA
3. Introduction to textile finishing by J.T. Marsh
4. Textile finishing by V.A. Shenai
5. Principles of textile printing by Asim Kumar Roy Choudhury

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	7	16
2	7	16
3	7	17
4	7	17
5	7	17
6	7	17
Total	42	100

PRACTICAL	3.2 TEXTILE PRINTING & FINISHING	L	T	P
		-	-	6

COURSE OBJECTIVE

The practical course Textile Printing & Finishing is designed to develop hands-on skills in fabric preparation and various printing techniques on natural and regenerated fibres. Students will perform preparatory processes and execute printing on cotton and rayon fabrics using methods such as block, screen, batik, and stencil printing. The objective is to enhance students' practical knowledge of colour application, pattern creation, process control, and finishing techniques, enabling them to produce high-quality, uniform, and visually appealing printed textiles suitable for industrial and creative applications.

COURSE OUTCOMES (CO):

The experiment should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following
Students will be able to

CO1 Prepare fabrics for printing by performing desizing, scouring, and other preparatory processes.
CO2 Apply block printing techniques on cotton and rayon fabrics with precision and accuracy.
CO3 Execute screen printing on cotton fabrics using appropriate methods and colour application.
CO4 Perform batik and stencil printing techniques on cotton fabrics, achieving uniform patterns and designs.
CO5 Develop practical skills in handling various printing tools, dyes, and auxiliaries to achieve high-quality prints.
CO6 Evaluate printed fabrics for quality, uniformity, and finish, and understand corrections for common printing defects.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	-	2	2	-	-	1	*	*
CO2	3	2	2	3	-	-	2	*	*
CO3	3	2	2	2	-	-	2	*	*
CO4	3	2	3	3	1	-	1	*	*
CO5	3	2	3	3	1	-	2	*	*
CO6	3	2	3	3	1	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

1. Preparation of cloth for printing. **(14 Periods)**
2. Printing of cotton fabric by block printing **(14 Periods)**
3. Printing of cotton fabric by screen printing **(14 Periods)**
4. Printing of cotton fabric by batik printing **(14 Periods)**
5. Printing of cotton fabric by stencil printing **(14 Periods)**
6. Printing of rayon fabric by block printing **(14 Periods)**

INSTRUCTIONAL STRATEGY

Student should be encouraged to participate in role play and other student centred activities in classroom and actively participate in listening exercises

MEANS OF ASSESSMENT

- Assignments and quiz/class tests, mid-semester and end-semester written tests
- Actual practical work, exercises and viva-voce
- Presentation and viva-voce

RECOMMENDED BOOKS

1. Textile printing by Leslie W.C. Miles
2. Pretreatment of textile materials for dyeing and printing by Dr.M.S.Parmar published by NITRA
3. Introduction to textile finishing by J.T. Marsh
4. Textile finishing by V.A. Shenai
5. Principles of textile printing by Asim Kumar Roy Choudhury

THEORY	3.3 FABRIC STRUCTURE	L	T	P
		4	-	-

COURSE OBJECTIVE

The course Fabric Structure is designed to provide students with a thorough understanding of woven fabric construction, terminology, and design principles. It covers the fundamentals of warp, weft, ends, picks, weave patterns, draft and peg plans, and denting. Students will learn the construction, design, and application of a wide range of fabrics including plain, twill, satin, sateen, pique, welt, Bedford cord, backed fabrics, extra warp/weft fabrics, and double cloth. The objective is to develop the ability to analyze, design, and construct various woven fabrics, equipping students with practical and theoretical skills for textile design, production planning, and quality control in the textile industry.

COURSE OUTCOMES (CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following

Students will be able to

CO1 Understand and define technical terminology in woven fabric construction, including warp, weft, ends, picks, weave, draft, peg plan, and denting.

CO2 Analyze and construct plain weaves and their derivatives such as warp rib, weft rib, and basket (matt) weaves using draft and peg plans.

CO3 Apply principles of twill weaves and their derivatives, including herringbone, wavy, curved, broken, transposed, combined, and diamond weaves, in fabric design.

CO4 Design and construct satin, sateen, corkscrew, crepe, huckaback, and honeycomb weaves using draft and peg plans.

CO5 Understand and design specialty fabrics such as piques and welts, including their structure, characteristics, and applications.

CO6 Analyze and construct Bedford cord and backed fabrics, including plain-faced, wadded, warp-backed, and weft-backed varieties, and understand drafting and beaming procedures.

CO7 Understand and design extra warp and extra weft fabrics, including principles of figuring and disposing extra threads, and create spot figures in fabric construction.

CO8 Analyze and construct double and multiple cloths, including drafting, pegging, and beaming procedures, and understand the applications of complex woven structures.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	-	2	-	-	-	2	*	*
CO2	3	2	2	-	-	-	2	*	*
CO3	3	2	2	-	-	-	2	*	*
CO4	3	2	3	-	-	-	2	*	*
CO5	3	2	3	-	-	-	2	*	*

CO6	3	2	3	-	-	-	2	*	*
CO7	3	3	3	-	-	-	2	*	*
CO8	3	3	3	-	-	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

UNIT-1 (INTRODUCTION TO TECHNICAL TERMINOLOGY IN CLOTH CONSTRUCTION) (2 Periods)

Study of fundamental terms such as warp, weft, ends, picks, weave, design, repeat of design, draft, peg plan, and denting plan. Classification of woven fabrics, Construction of drafts and lifting plans, Denting

UNIT-2 (PLAIN WEAVE AND ITS DERIVATIVES) (6 Periods)

Fundamentals and design, draft and peg plans of following weaves - Plain weave, Warp rib weave, Weft rib weave, Matt (hopsack or basket) weaves.

UNIT-3 (TWILL WEAVES AND THEIR DERIVATIVES) (6 Periods)

Fundamentals and design, draft and peg plans of following weaves - Regular or basic twill weaves, Pointed/Zigzag/ Wavy twill, Herringbone twill weaves, Curved twill weaves, Broken twill weaves, Transposed/ Rearranged twill weaves, Combined twill weaves, Diamond weaves

UNIT-4 (SATIN, SATEEN, AND RELATED WEAVES) (6 Periods)

Fundamentals and design, draft and peg plans of following weaves - Satin and sateen weaves - Regular and Irregular, Corkscrew weave - warp faced and weft faced, Crepe weaves, Huckaback weaves, Honeycomb weaves, Brighton honeycomb weaves

Unit-5 (WELTS AND PIQUES) (8 Periods)

Overview of pique and welt fabric varieties and their characteristics and application, their structure. Study of different types of welts and piques

Unit-6 (BEDFORD CORDS, BACKED FABRICS) (8 Periods)

Introduction to the Bedford cord fabrics, Study of Plain faced bedford cord , wadded bedford cord, bedford cord arranged on pair of picks and alternate picks and cords containing odd number of ends. twill-faced bedford cords. Introduction to the Backed fabrics, their characteristics and application. Warp backed and weft backed fabrics. wadded backed fabrics. Methods of their beaming and drafting procedure.

Unit-7 (EXTRA WARP AND WEFT) (10 Periods)

Overview of extra warp and extra weft fabrics, their characteristics and application. Principles of figuring with extra warp and weft. Methods of disposing of extra threads on the back of the fabric. Spot figures with extra warp and extra weft arranged in a particular order.

Unit-8 (DOUBLE CLOTH) **(10 Periods)**

Overview of double cloth, their characteristics and application. Construction of double and multiple cloths on design paper, their beaming, drafting and pegging. Different types of double cloth fabric structures and their construction on point paper.

INSTRUCTIONAL STRATEGY

Student should be encouraged to participate in role play and other student centered activities in class room and actively participate in listening exercises.

MEANS OF ASSESSMENT

- Assignments and quiz/class tests, mid-semester and end-semester written tests
- Actual practical work, exercises and viva-voce
- Presentation and viva-voce

RECOMMENDED BOOKS

1. Gokarneshan, N., *Fabric Structure and Design*, New Age International Pvt Ltd.
2. Grosicki, Z. J. (Ed.), *Watson's Textile Design & Colour*, Woodhead Publishing.
3. Hayavadana, Dr. J., *Woven Fabric Structure, Design and Product Planning*, Woodhead Publishing India.
4. Alderman, Sharon, *Mastering Weave Structures*, Interweave Press.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	2	05
2	6	10
3	6	10
4	6	11
5	8	14
6	8	14
7	10	18
8	10	18
Total	**56**	**100**

PRACTICAL	3.4 FABRIC STRUCTURE	L	T	P
		-	-	6

COURSE OBJECTIVE

The practical course Fabric Structure is designed to develop hands-on skills in constructing and analyzing woven fabrics. Students will prepare samples of elementary weaves such as plain, rib, twill, and satin/sateen, and learn to apply draft and peg plans accurately. The course also focuses on analyzing fabrics to determine EPI (Ends Per Inch), PPI (Picks Per Inch), weave patterns, and reproducing design drafts on graph paper. The objective is to strengthen practical understanding of fabric construction, weave design, and analytical skills necessary for textile production and quality assessment.

COURSE OUTCOMES (CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following
Students will be able to

CO1 □ Prepare and construct samples of basic weaves including plain, rib, twill, and satin/sateen with correct draft and peg plans.
CO2 □ Develop skills in setting up warp and weft arrangements for various weave structures accurately.
CO3□ Analyze fabrics to determine EPI, PPI, weave patterns, and draft structures.
CO4□ Reproduce weave designs and peg plans on graph paper for selected fabric samples.
CO5□ Apply practical knowledge to assess fabric quality, structure, and design consistency.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	2	2	-	-	2	*	*
CO2	3	2	2	2	-	-	2	*	*
CO3	3	2	2	2	-	-	2	*	*
CO4	3	2	3	2	-	-	2	*	*
CO5	3	2	3	2	-	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

LIST OF PRACTICAL

1. **Preparation of samples of elementary weaves (any six samples out of these)- (28 Periods)**
   a. Plain weave
   b. Warp Rib weave
   c. Weft Rib weave
   d. Matt rib weave
   e. Regular Twill weave
   f. Satin/Sateen weave
   g. Pointed twill weave
   h. Herringbone twill weave

2. **Analysis of different fabrics for - (28 Periods)**
   a. EPI and PPI – Any 4 samples
   b. Its weave and make design draft and peg plan on graph paper – Any 4 samples

PRACTICAL	3.5 COMPUTER AIDED TEXTILE DESIGN-I	L	T	P
		-	-	6

COURSE OBJECTIVE

The practical course Computer Aided Textile Design-I is aimed at developing students' proficiency in digital textile design using vector graphics and photo editing software. Students will gain hands-on experience in creating motifs, arranging designs, developing repeats, and converting hand-sketched images into digital formats. The course also emphasizes color management, surface design, and texture editing to enhance visual appeal and accuracy of textile patterns. The objective is to equip students with the skills to leverage computer-aided tools for innovative, precise, and professional textile design, preparing them for both creative and industrial applications.

COURSE OUTCOMES (CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following

Students will be able to

CO1 Understand the interface, tools, and functionalities of vector graphics and photo editing software relevant to textile design.

CO2 Create and manipulate motifs using vector graphics software, including development from hand-sketched images.

CO3 Arrange and position motifs effectively, develop design repeats, and apply color palettes and themes.

CO4 Edit hand-sketched motifs, manage layers, and perform surface design and texture editing using photo editing software.

CO5 Apply digital tools to produce professional textile designs, demonstrating accuracy, creativity, and application of design principles.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	-	-	3	-	-	2	*	*
CO2	3	2	2	3	-	-	2	*	*
CO3	3	2	2	3	-	-	2	*	*
CO4	3	2	3	3	-	-	2	*	*
CO5	3	2	3	3	-	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

LIST OF PRACTICAL

Software to be used, students should be explained their difference and applications –

1. Vector Graphics Software - Corel Draw, Adobe Illustrator, Inkscape (open source) or other similar software.
2. Photo editing software – Adobe Photoshop, GIMP (open source) or other similar software.

Note: These are common software with wide application, the practical work given to the students should be focused on their application in Textile Designing.

Practicals:

1. **On Vector graphics software, the students should learn – (28 Periods)**
   - 1.1. Basic tools and interface, different images formats
   - 1.2. Shapes tools
   - 1.3. Development of motifs
   - 1.4. Positioning and arrangement of motifs
   - 1.5. Development of design repeat
   - 1.6. Development of motifs from hand sketched scanned image
   - 1.7. Use of colour pallets and colour themes
2. **On Photo editing software, the students should learn - (28 Periods)**
   - 2.1. Basic tools and interface, different images formats
   - 2.2. Selection and adjustment tools
   - 2.3. Editing hand sketched motifs
   - 2.4. Surface design and Texture editing
   - 2.5. Layer management and composition
   - 2.6. Colour pallets and themes.

THEORY	3.6 ECONOMIC POLICIES IN INDIA (OE-1)	L	T	P
		2	-	-

COURSE OBJECTIVE

The objective of this course is to familiarize the students of different streams with the basic concepts, structure, problems and issues concerning Indian economy.

COURSE OUTCOMES (CO):

CO1: Explain the basic features of the Indian economy, including demographic trends, and analyze major economic problems like poverty, unemployment, and inflation.
CO2: Discuss the role of the agricultural sector, the impact of land reforms and the Green Revolution, and evaluate current agricultural policies.
CO3: Describe the industrial development pattern, the significance of small-scale industries, and the growth of the service sector in India.
CO4: Analyze the framework of economic planning (Planning Commission vs. NITI Aayog), and the impact of Monetary, Fiscal, and LPG policies.
CO5: Interpret India's external sector performance, including foreign trade composition, Balance of Payments, and the impact of Globalization and WTO.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	1	2	-	-	2	1	2	*	*
CO2	1	2	-	-	2	1	1	*	*
CO3	1	1	-	-	2	2	2	*	*
CO4	1	2	-	-	3	3	2	*	*
CO5	1	2	-	-	2	2	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

COURSE CONTENTS

UNIT-1: **(6 Periods)**

Basic features and problems of Indian Economy: Economic History of India; Nature of Indian

Economy, demographic features and Human Development Index, Problems of Poverty, Unemployment, Inflation, income inequality, Black money in India.

UNIT-2: **(5 Periods)**

Sectoral composition of Indian Economy: Issues in Agriculture sector in India, land reforms Green Revolution and agriculture policies of India,

UNIT-3: **(5 Periods)**

Industrial development, small scale and cottage industries, industrial Policy, Public sector in India, service sector in India.

UNIT-4: **(7 Periods)**

Economic Policies: Economic Planning in India, Planning commission v/s NITI Aayog, Five Year Plans, monetary policy in India, Fiscal Policy in India, Centre state Finance Relations, Finance commission in India. LPG policy in India**.**

UNIT-5: **(5 Periods)**

External sector in India: - India's foreign trade value composition and direction, India Balance of payment since 1991, FDI in India, Impact of Globalization on Indian Economy, WTO and India.

INSTRUCTIONAL STRATEGY

- Teachers should focus on conceptual clarity.
- An industrial visit can be organized in relevant industries. Audio-visuals aids should be used to teach.

MEANS OF ASSESSMENT

- Assignments and quiz/class tests
- Seminar, Presentation, Viva-voce.

RECOMMENDED BOOKS:

1. Dutt Rudder and K.P.M Sunderam (2017). Indian Economy. S Chand & Co. Ltd. New Delhi.
2. Mishra S.K & V.K Puri (2017). Indian Economy and –Its Development Experience. Himalaya Publishing House.
3. Singh, Ramesh, (2016): Indian Economy, Tata-McGraw Hill Publications, New Delhi.
4. Dhingra, I.C., (2017): March of the Indian Economy, Heed Publications Pvt. Ltd.
5. Karam Singh Gill, (1978): Evolution of the Indian Economy, NCERT, New Delhi
6. Kaushik Basu (2007): The Oxford Companion to Economics of India, Oxford University Press.

SUGGESTED DISTRIBUTION OF MARK

Topic No.	Time Allotted (periods)	Marks Allotted (%)
1	06	20
2	05	20
3	05	17
4	07	23
5	05	20
Total	**28**	**100**

THEORY	3.6 PROJECT MANAGEMENT (OE-1)	L	T	P
		2	-	-

COURSE OBJECTIVE

The aim of this course is to help the students to develop the idea of project plan, from defining and confirming the project goals and objectives, identifying tasks and how goals will be achieved.

COURSE OUTCOMES (CO):

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: Explain the fundamental concepts of project management, including the project life cycle and priorities, and construct a Work Breakdown Structure (WBS) for a given project.

CO2: Apply the capital budgeting process to generate and screen project ideas and analyze market feasibility using demand forecasting techniques.

CO3: Estimate project costs, working capital requirements, and prepare projected financial statements including Cash Flow and Break-Even analysis.

CO4: Evaluate the financial viability of projects using discounting (NPV, IRR) and non-discounting (Payback, ARR) capital budgeting techniques and social cost-benefit analysis.

CO5: Develop project schedules using Network Planning techniques (CPM/PERT) to analyze time-cost trade-offs and determine the least cost duration.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	2	1	1	-	-	3	1	*	*
CO2	2	2	-	-	1	3	2	*	*
CO3	2	2	-	-	-	3	1	*	*
CO4	2	2	-	-	2	3	2	*	*
CO5	2	3	1	2	-	3	1	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

COURSE CONTENTS

Unit-1: **(6 Periods)**

CONCEPT OF A PROJECT: Classification of projects- importance of project management- The project life cycle- establishing project priorities (scope-cost-time)project priority matrix- work break down structure.

Unit-2: **(6 Periods)**

CAPITAL BUDGETING PROCESS: Planning- Analysis-Selection-Financing-Implementation-Review. Generation and screening of project ideas- market and demand analysis- Demand forecasting techniques. Market planning and marketing research process- Technical analysis

Unit-3: **(5 Periods)**

FINANCIAL ESTIMATES AND PROJECTIONS: Cost of projects-means of financing-estimates of sales and production-cost of production-working capital requirement and its financing-profitability

projected cash flow statement and balance sheet. Break even analysis.

Unit-4: **(5 Periods)**

BASIC TECHNIQUES IN CAPITAL BUDGETING: Non discounting and discounting methods- payback period- Accounting rate of return-net present value-Benefit cost ratio-internal rate of return.

Project risk. Social cost benefit analysis and economic rate of return. Non-financial justification of

projects**.**

Unit-5: **(6 Periods)**

PROJECT ADMINISTRATION: progress payments, expenditure planning, project scheduling and network planning, use of Critical Path Method (CPM), schedule of payments and physical progress, time-cost trade off. Concepts and uses of PERT cost as a function of time, Project Evaluation and Review Techniques/cost mechanisms. Determination of least cost duration. Post project evaluation. Introduction to various Project management softwares.

INSTRUCTIONAL STRATEGY

- Teachers should focus on conceptual clarity.
- An industrial visit can be organized in relevant industries. Audio-visuals aids should be used to teach.

MEANS OF ASSESSMENT

- Assignments and quiz/class tests
- Seminar, Presentation, Viva-voce.

RECOMMENDED BOOKS:

1. Project planning, analysis, selection, implementation and review – Prasannachandra – Tata McGraw Hill
2. Project Management – the Managerial Process – Clifford F. Gray & Erik W. Larson – McGraw Hill

3. Project management - David I Cleland - Mcgraw Hill International Edition, 1999
4. Project Management – Gopala Krishnan – Mcmillan India Ltd.
5. Project Management- Harry-Maylor-Peason Publication

SUGGESTED DISTRIBUTION OF MARK

Topic No.	Time Allotted (periods)	Marks Allotted (%)
1	06	17
2	06	20
3	05	20
4	05	20
5	06	23
Total	**28**	**100**

THEORY	4.1 ADVANCE TEXTILE PRINTING	L	T	P
		6	-	-

COURSE OBJECTIVE

The course Advanced Textile Printing is designed to provide in-depth technical knowledge and practical competence in advanced textile printing processes and technologies. It focuses on discharge and resist printing on cotton using vat and reactive dyes, pigment printing techniques, and specialty prints such as raised, flock, and foam printing. The course covers printing on synthetic fibers and blends, including polyester, nylon, acrylic, and polyester-cotton, along with roller, flatbed, and rotary screen printing systems. Students will learn rotary screen preparation, squeegee mechanisms, process comparison, fault identification, and rectification methods. The curriculum also introduces polychromatic, transfer, and yarn printing, highlighting recent technological developments to equip learners with industry-ready skills and professional expertise.

COURSE OUTCOMES (CO):

The theory and experiment should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following **Students will be able to**

CO1 Explain and apply discharge and resist printing techniques on cotton using vat and reactive dyes, including pigment printing methods..

CO2 Demonstrate knowledge of specialty printing techniques such as raised, flock, and foam printing.

CO3 Apply appropriate printing methods for synthetic fibers and their blends, including polyester, nylon, acrylic, and polyester-cotton.

CO4 Understand roller printing techniques, identify common printing faults, and implement suitable rectification measures.

CO5 Operate and compare flatbed and rotary screen printing machines, including preparation of rotary screens and evaluation of different squeegee systems.

CO6 Explain the principles and applications of polychromatic printing and transfer printing processes.

CO7 Describe yarn printing techniques and evaluate the latest developments and technological advancements in textile printing.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	2	1	2	-	2	*	*
CO2	3	2	2	2	2	-	2	*	*
CO3	3	3	2	2	1	-	2	*	*
CO4	3	3	3	3	1	-	2	*	*

CO5	3	2	3	3	1	2	2	*	*
CO6	3	2	2	2	1	-	2	*	*
CO7	2	2	2	1	1	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

Unit 1. Discharge and resist style of printing on cotton using vat, reactive. Pigment printing using pigment separately and along with other colours. **(12 Periods)**

Unit 2. Various types of printing such as raised, Flock and Foam printing. **(12 Periods)**

Unit 3. Printing of synthetic and their blends-(Polyeste, Nylon, Acrylic and Polyester Cotton). **(12 Periods)**

Unit 4. Roller Printing, Printing technique, Common faults and their rectifications. **(12 Periods)**

Unit 5. Flatbed and rotary screen printing M/c. Preparation of rotary screens, Different squeezee system and their comparison with roller printing. **(12 Periods)**

Unit 6. Introduction to polychromatic printing and transfer printing. **(12 Periods)**

Unit 7. Introduction to printing of yarn. Latest development in Textile Printing**. (12 Periods)**

INSTRUCTIONAL STRATEGY

Student should be encouraged to participate in role play and other student centred activities in class room and actively participate in listening exercises

MEANS OF ASSESSMENT

- Assignments and quiz/class tests, mid-semester and end-semester written tests
- Actual practical work, exercises and viva-voce
- Presentation and viva-voce

RECOMMENDED BOOKS

1. Textile printing by Leslie W.C. Miles
2. Pretreatment of textile materials for dyeing and printing by Dr.M.S.Parmar published by NITRA
3. Introduction to textile finishing by J.T. Marsh
4. Textile finishing by V.A. Shenai
5. Principles of textile printing by Asim Kumar Roy Choudhury
6. Textile Printing by RS Prayceg.
7. Technology of Printing (Volume-IV) by V.A. Shenai, Pub-Sevak Publication
8. Textile Printing by LWC Miles (Revised Second Edition)

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	12	14
2	12	14
3	12	15
4	12	14
5	12	14
6	12	14
7	12	15
Total	84	100

THEORY	4.2 TEXTILE DESIGN-I	L	T	P
		4	-	-

COURSE OBJECTIVE

The course Textile Design-I is designed to develop students' skills in creating and applying textile designs using traditional and practical design techniques. Students will learn free-hand sketching, motif construction, design repeats, and the composition of bi-symmetrical and multi-symmetrical patterns. The course emphasizes arrangement of motifs, development of stripes and checks—including regular, irregular, counter-change, graduated, and modified patterns—and preparation of designs suitable for dobby and jacquard weaving. The objective is to provide students with a strong foundation in creative design, enabling them to produce visually appealing and technically feasible textile patterns for both weaving and printing applications.

COURSE OUTCOMES (CO):

The theory and experiment should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following

Students will be able to

CO1 □ Develop proficiency in free-hand sketching, and in the enlargement and reduction of design motifs

CO2 □ Construct motifs suitable for textile printing and weaving designs.

CO3□ Compose bi-symmetrical and multi-symmetrical designs for creative textile applications..

CO4□ Arrange motifs effectively to create cohesive and balanced design compositions.

CO5□ Develop stripe and check patterns, including simple, counter-change, graduated, and modified designs.

CO6□ Design patterns suitable for dobby and jacquard weaving with proper technical considerations.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	2	3	-	-	2	*	*
CO2	3	2	3	3	-	-	2	*	*
CO3	3	2	3	3	1	-	2	*	*
CO4	3	2	3	3	1	-	2	*	*
CO5	3	2	3	3	1	-	2	*	*
CO6	3	2	3	3	1	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

UNIT-1 **(8 Periods)**

Free hand sketching, enlargment and reduction of design. Concept of design repeats

UNIT-2 **(8 Periods)**

Construction of motif suitable for printing & weaving design.

UNIT-3 **(8 Periods)**

Composition of Bi-symmetrical and Multi-symmetrical.

UNIT-4 **(8 Periods)**

Preparation of motif and their arrangement.

UNIT-5 **(14 Periods)**

Development of stripe and check pattern -
1 Simple - Regular and Irregular patern.
2 Counter change pattern.
3 Graduated pattern.
4 Modified Pattern.

UNIT-6 **(10 Periods)**

Development of design - suitable for dobby and Jacquards.

INSTRUCTIONAL STRATEGY

Student should be encouraged to participate in role play and other student centred activities in class room and actively participate in listening exercises.

MEANS OF ASSESSMENT

- Assignments and quiz/class tests, mid-semester and end-
- semester written test
- Actual practical work, exercises and viva-voce
- Presentation and viva-voc

RECOMMENDED BOOKS

1. Fabric Structure and Design by N.Gokarveshan
2. Watson's textile design & colour by Z.J.Grosicki.
3. Woven fabric structure design and product planning by Dr. J. Hayavadana
4. Mastering weaves structure- Sharon Alderman-Inter weave Press

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	8	14
2	8	14
3	8	14
4	8	14
5	14	26
6	10	18
Total	**56**	**100**

PRACTICAL	4.3 TEXTILE DESIGN-I	L	T	P
		-	-	04

COURSE OBJECTIVE

The Textile Design-I aims to develop students' hands-on skills in sketching, motif creation, pattern development, and arrangement for textile applications. Students will learn free-hand sketching, enlargement and reduction of designs, and concept of design repeats. They will construct motifs suitable for weaving and printing, compose bi-symmetrical and multi-symmetrical designs, and arrange motifs into balanced compositions. The course emphasizes development of stripe and check patterns—including regular, irregular, counter-change, graduated, and modified designs—and prepares students to create designs suitable for dobby and jacquard weaving. The objective is to integrate creativity with practical textile design techniques to produce technically feasible and visually appealing patterns.

COURSE OUTCOMES (CO):

The theory and experiment should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following
Students will be able to

CO1 □ Execute free-hand sketching and apply enlargement, reduction, and design repeat concepts in textile design
CO2 □ Construct motifs suitable for printing and weaving applications.
CO3□ Compose bi-symmetrical and multi-symmetrical designs effectively for textile patterns.
CO4□ Arrange motifs into harmonious compositions for practical design applications.
CO5□ Develop stripe and check patterns, including simple, counter-change, graduated, and modified variations.
CO6□ Prepare designs suitable for dobby and jacquard weaving with technical accuracy.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	2	3	1	-	2	*	*
CO2	3	3	3	3	1	-	2	*	*
CO3	3	2	3	3	1	-	2	*	*
CO4	3	2	3	3	1	-	2	*	*
CO5	3	2	2	3	1	-	2	*	*
CO6	3	2	3	3	1	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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LIST OF PRACTICAL

1. Free hand sketching, enlargment and reduction of designs.Concept of design repeats **(09 Periods)**
2. Construction of motif suitable for printing & weaving design. **(09 Periods)**
3. Composition of Bi-symmetrical and Multi-symmetrical. **(09 Periods)**
4. Preparation of motif and their arrangement. **(09 Periods)**
5. Development of stripe and check pattern – **(11 Periods)**
    - Simple - Regular and Irregular pattern.
    - Counter change pattern.
    - Graduated pattern.
    - Modified pattern.
6. Development of design - suitable for dobby and Jacquards. **(09 Periods)**

RECOMMENDED BOOKS

1. Fabric Structure and Design by N.Gokarveshan
2. Watson's textile design & colour by Z.J.Grosicki.
3. Woven fabric structure design and product planning by Dr. J. Hayavadana
4. Mastering weaves structure- Sharon Alderman-Inter weave Press

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PRACTICAL	4.4 COMPUTER AIDED TEXTILE DESIGN-II	L	T	P
		-	-	4

COURSE OBJECTIVE

The Computer Aided Textile Design-II practicum aims to equip students with advanced digital skills for creating textile designs using industry-standard software such as Arahne, Digibunai, Nedgraphics, and similar tools. Students will learn to develop and edit dobby and jacquard weaves, generate drafts and peg plans, and simulate fabrics on end products. They will also gain proficiency in digital motif creation, arrangement, composition, color separation, and theme application for print design. The course integrates technical design knowledge with digital tools, enabling students to produce precise, professional-quality textile designs ready for weaving, printing, and garment applications.

COURSE OUTCOMES (CO):

The theory and experiment should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following
Students will be able to

CO1 Operate dobby designing software to develop, edit, and simulate woven fabrics digitally.
CO2 Generate drafts, peg plans, and weave structures for dobby fabrics using software tools.
CO3 Utilize jacquard designing software to create, edit, and compose motifs with integrated weave insertion.
CO4 Apply fabric simulation and draping tools to visualize woven and jacquard designs on end products.
CO5 Develop and arrange print designs digitally, perform color separation, and apply color palettes and themes for textile applications.
CO6 Integrate digital textile design tools to produce technically accurate and visually appealing designs for professional applications.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	3	3	1	-	2	*	*
CO2	3	2	3	3	1	-	2	*	*
CO3	3	2	3	3	1	-	2	*	*
CO4	3	2	3	3	1	-	2	*	*
CO5	3	2	3	3	1	-	2	*	*
CO6	3	2	3	3	1	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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LIST OF PRACTICAL

Software to be used for this course are – Arahne, Digibunai, Nedgraphics or other similar alternatives.

Practicals:

1. **On Dobby Designing software, the students should learn - (18 Periods)**
   - 1.1.Basic tools and interface
   - 1.2.Development of Weaves
   - 1.3.Weave editing tools
   - 1.4.Generation of draft, peg plan for weaves
   - 1.5.Fabric simulation and draping on end product
2. **On Jacquard Designing software, the students should learn - (18 Periods)**
   - 2.1.Basic tools and interface, different images formats
   - 2.2.Development of motifs and design composition
   - 2.3.Editing hand sketched motifs
   - 2.4.Insertion of weave
   - 2.5.Fabric Simulation and draping on end product
3. **On Print design software, the student should learn - (20 Periods)**
   - 3.1.Basic tools and interface, different images formats
   - 3.2.Development of motifs
   - 3.3.Arrangement of motifs and design composition
   - 3.4.Colour separation for screen development
   - 3.5.Colour palette and themes
   - 3.6.Fabric Simulation and draping on end product

RECOMMENDED BOOKS

1. Manual of Autotex, Texdesigner, Arhane weaves and Net graphics Software.

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THEORY	4.5 FABRIC MANUFACTURING PROCESS –I (POE-1)	L	T	P
		3	1	-

COURSE OBJECTIVE

The Fabric Manufacturing Process-I course provides students with a comprehensive understanding of the fundamental processes involved in transforming yarns into woven fabrics. It covers the preparation stages such as winding, warping, sizing, drawing-in, and beaming, emphasizing their objectives, techniques, and machinery. Students learn the passage of warp through looms, types of weaving machines, and essential elements of handlooms, power looms, and automatic looms. The course aims to develop technical knowledge and analytical skills necessary to identify faults, select appropriate machinery, and ensure efficient production while maintaining fabric quality and structural integrity.

COURSE OUTCOMES (CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following

Students will be able to

CO1 Explain the processes involved in weaving preparation, including winding, pirn winding, and fault identification.

CO2 Understand warping and sizing operations, types of machines, sizing ingredients, and their impact on yarn quality.

CO3 Apply knowledge of drawing-in and beaming processes, including reed count and head count concepts.

CO4 Identify and classify different types of weaving machines, including handloom, power loom, and automatic looms.

CO5 Describe the passage of warp through the loom and its essential parts to ensure proper fabric formation.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	2	2	2	-	1	*	*
CO2	3	3	2	2	2	-	1	*	*
CO3	3	3	3	3	2	-	2	*	*
CO4	3	2	3	2	2	-	2	*	*
CO5	3	2	3	2	2	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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DETAILED CONTENTS

UNIT-1 WEAVING PREPARATION (10 Periods)

1.1 Flow chart of the process involved in preparation for weaving.

1.2 Winding :

i. Its object, types on basis of machine speed and winding packages, passage of material through winding machine (slow speed) and any high speed drum winding machine.

ii. Faults found in winding package.

iii. General idea of pirn winding and its need and advantage.

UNIT-2 WARPING AND SIZING (10 Periods)

1.1 Its main objects, general idea of beam and sectional warping machine.

1.2 Sizing :-

i. Its main objects, methods of sizing on the basis of drying system used for drying wet yarn and on the basis of amount of size put on the yarn.

ii. Sizing ingredients for cotton and cotton blends.

iii. Passage of warp sheet through slasher sizing machine and knowledge of necessary part of machine.

UNIT-3 DRAWING IN & BEAMING (12 Periods)

Its main objects , different method used in textile industry, concept of reed and head count.

UNIT-4 INTRODUCTION TO WEAVING (12 Periods)

Classification of various types of weaving machine. Study of handloom, power loom and elementry knowledge of automatic looms**.**

UNIT-5 PASSAGE OF WARP ON LOOM (12 Periods)

Passage of warp on loom. Showing all its necessary parts**.**

INSTRUCTIONAL STRATEGY

Student should be encouraged to participate in role play and other student centred activities in class room and actively participate in listening exercises

MEANS OF ASSESSMENT

- Assignments and quiz/class tests, mid-semester and end-semester written tests
- Actual practical work, exercises and viva-voce

Presentation and viva-voce

RECOMMENDED BOOKS

- Yarn Preparation-Vol-I & II by Sengupta.
- Fibre to Fabric by PR Lord
- An introduction to winding & warping by M.K.Talukdar,
- Modern preparation & weaving machinery, by A. Ormerod, Textile Institute, U.K.
- Yarn winding by Banerjee and Alagirusamy (NCUTE publication).

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SUGGESTED DISTRIBUTION OF MARKS

Unit	Time Allotted (Periods)	Marks Allotted (%)
1	10	17
2	10	17
3	12	22
4	12	22
5	12	22
Total	56	**100**

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THEORY	4.5 TECHNICAL TEXTILE & NON WOVEN TECHNOLOGY (POE-1)	L	T	P
		3	1	-

COURSE OBJECTIVE

The course on Technical Textile and Nonwoven Technology provides students with a clear understanding of fibres, yarns, fabrics, and their applications in technical and industrial textiles. It covers the classification, properties, and functions of geotextiles, medical textiles, protective textiles, automotive textiles, and agro-textiles. Students also learn nonwoven fabric technologies, web formation, bonding methods, and applications, enabling them to analyze, select, and apply technical textiles and nonwovens effectively in diverse industrial, medical, and environmental contexts.

COURSE OUTCOMES (CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following.

Students will be able to

CO1 Understand the classification, properties, and applications of fibres, yarns, and fabrics used in technical textiles

CO2 Analyze the structure, functions, and performance of geotextiles, including their manufacturing and essential properties..

CO3 Explain the types, properties, and applications of medical textiles and protective textiles for healthcare and safety

CO4 Understand the applications of technical textiles in automotive and agro-industries and their functional requirements..

CO5 Describe nonwoven fabric technologies, including web formation, bonding techniques, and their industrial applications.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	-	-	2	-	2	*	*
CO2	3	3	2	2	2	-	2	*	*
CO3	3	3	2	2	2	-	2	*	*
CO4	3	3	2	2	2	-	2	*	*
CO5	3	2	2	2	2	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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COURSE CONTENTS

UNIT-1. Introduction (08 Periods)

Definition, classification, products, Fibres used in technical textiles, yarns and fabric structures in technical textiles and their relevant properties. Fibres used for technical textiles - their characteristics and application areas

UNIT-2. Geo Textiles (10 Periods)

Introduction of Geo textiles, classification of geo textiles, functions of geo textiles oil reinforcement, drainage (fluid transmission), filtration, separation, erosion control/absorption, objective of geo textiles, manufacturing of geo textile, essential properties of geo textiles.

UNIT-3. Medical Textiles and Protective textiles (14 Periods)

Medical textiles, fibres used, classification of medical textiles- non-implantable material wound dressings, bandages, plasters, etc, Extra-corporal devices, implantable material, Healthcare/ hygiene products, surgical gown, face mast etc.

Manufacture and properties of protective textile**s**- water proof/coated and water repellent, flame retardant, chemical resistance, mechanical resistance such as bullet proof, cut proof, stab proof.

UNIT-4. Automotive Textiles and Agro textiles (08 Periods)

Automotive textiles: type cord, seat belt, air bag, seat upholstery, carpets, headliners, helmets etc,
Agro textile: Shade net, green house film, Mulch net, crop cover, anti-hail and bird protection net, finishing net etc.

UNIT-5. Nonwoven (16 Periods)

Nonwovens: Overview of Nonwovens, Definition of Nonwoven, Classification of Nonwoven. Steps of making nonwoven. ii) Polymer based Technology : Melt blown, Spun bond, SMS iii) Staple fibre-based Technology: a) Formation of Web: Carding, Air laid, Rando web, Wet laid b) Bonding Technique: Mechanical (needle punching, Stitch bonding), Thermal bonding, Chemical Bonding, Water jet Bonding (SPUNLACE), Application area of Nonwoven.

INSTRUCTIONAL STRATEGY

Teachers should take theory lectures, demonstrate concepts and prototype

MEANS OF ASSESSMENT

- Assignments and quiz/class tests
- Mid-term and end-term written tests

BOOKS RECOMMENDED

1. Hand book on technical textile(Wood head publishing series in textile),A R Horrocks(Editor), Subhash C. Anand(Editor)
2. High performance technical textile by roshan Paul
3. Nonwoven Fabrics: Raw Materials, Manufacture, Applications, Characteristics, Testing Processes Edited by W. Albrecht, H. Fuchs, W. Kittelmann
4. Handook of Nonwoven Edited by S.J. Russell

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Websites for Reference:

1. https://nptel.ac.in/courses/116102057

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time allotted (Periods)	Marks allotted (%)
1	08	15
2	10	20
3	14	25
4	08	15
5.	16	25
Total	**56**	**100**

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THEORY	4.6 RENEWABLE ENERGY TECHNOLOGIES (OE 2)	L	T	P
		2	-	-

COURSE OBJECTIVE

The objectives of this course are to:

- Provide a comprehensive understanding of the **current and future global energy scenario**.
- Introduce students to **renewable and non-conventional energy sources** as alternatives to fossil fuels.
- Enable understanding of **solar, wind, and bio-energy systems** and their working principles.
- Develop the ability to **evaluate suitable renewable energy options** for a given location.
- Familiarize students with **economic, environmental, and sustainability aspects** of renewable energy technologies.

COURSE OUTCOMES (CO):

After successful completion of this course, the students will be able to:

CO1: Explain the global energy scenario, energy resources, and the need for renewable energy with economic and environmental perspectives.
CO2: Describe principles, components, and applications of solar energy systems including solar thermal and solar PV technologies.
CO3: Explain wind energy fundamentals, types of wind energy systems, site selection, and performance aspects.
CO4: Evaluate bio-energy generation methods such as biomass combustion, biogas, biofuels, and cogeneration systems.
CO5: Identify and compare alternative renewable energy sources such as tidal, wave, hydro, geothermal, hydrogen, fuel cells, and hybrid systems for suitable applications.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

Course Outcomes (COs)	PO1 Basics & Discipline Knowledge	PO2 Problem Analysis	PO3 Design & Development	PO4 Tools, Experimentation & Testing	PO5 Socio-Economic/ Environmental	PO6 Project Mgmt & Communication	PO7 Life-long Learning	PSO1	PSO2
CO1	3	1	–	–	2	–	2	*	*
CO2	3	2	2	1	1	1	1	*	*
CO3	2	2	2	–	1	1	1	*	*
CO4	2	2	1	1	2	1	1	*	*
CO5	2	3	1	1	3	1	1	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)
* PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

COURSE CONTENT

UNIT-1: **(5 Periods)**

Introduction: World Energy Use; Reserves of Energy Resources; Environmental Aspects of Energy Utilisation; Renewable Energy Scenario in India and around the World; Potentials; Achievements / Applications; Economics of renewable energy systems.

UNIT-2: **(8 Periods)**

Solar energy: Solar Radiation; Measurements of Solar Radiation; Flat Plate and Concentrating Collectors; Solar direct Thermal Applications; Solar thermal Power Generation Fundamentals of Solar Photo Voltaic Conversion; Solar Cells; Solar PV Power Generation; Solar PV Applications.

UNIT-3: **(5 Periods)**

Wind Energy: Wind Data and Energy Estimation; Types of Wind Energy Systems; Performance. Site Selection; Details of Wind Turbine Generator; Safety and Environmental Aspects.

UNIT-4: **(5 Periods)**

Bioenergy: Biomass direct combustion; Biomass gasifiers; Biogas plants; Digesters; Ethanol production; Bio diesel; Cogeneration; Biomass Applications.

UNIT-5: **(5 Periods)**

Other Renewable Energy Sources: Tidal energy; Wave Energy; Open and Closed OTEC Cycles; Small Hydro-Geothermal Energy; Hydrogen and Storage; Fuel Cell Systems; Hybrid Systems.

INSTRUCTIONAL STRATEGY

- Teachers should focus on conceptual clarity.
- An industrial visit can be organized in relevant industries. Audio-visuals aids should be used to teach.

MEANS OF ASSESSMENT

- Assignments and quiz/class tests
- Seminar, Presentation, Viva-voce.

RECOMMENDED BOOKS

1. O.P. Gupta, Energy Technology, Khanna Publishing House, Delhi (ed. 2018)
2. Renewable Energy Sources, Twidell, J.W. & Weir, A., EFN Spon Ltd., UK, 2006.
3. Solar Energy, Sukhatme. S.P., Tata McGraw Hill Publishing Company Ltd., New Delhi, 1997.
4. Renewable Energy, Power for a Sustainable Future, Godfrey Boyle, Oxford University Press,U.K., 1996.
5. Fundamental of Renewable Energy Sources, GN Tiwari and MK Ghoshal, Narosa, New Delhi,2007.

6. Renewable Energy and Environment-A Policy Analysis for India, NH Ravindranath, UK Rao, B Natarajan, P Monga, Tata McGraw Hill.
7. Energy and The Environment, RA Ristinen and J J Kraushaar, Second Edition, John Willey & Sons, New York, 2006.
8. Renewable Energy Resources, JW Twidell and AD Weir, ELBS, 2006.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time allotted (Periods)	Marks Allotted (%)
1.	05	19
2.	08	24
3.	05	19
4.	05	19
5.	05	19
Total	**28**	**100**

THEORY	4.6 ENERGY EFFICIENCY AND AUDIT (OE-2)	L	T	P
		2	-	-

COURSE OBJECTIVE

The objectives of this course are to:

- Develop competency to **identify and implement energy efficiency measures** in industrial facilities.
- Enable understanding of **energy-efficient equipment and systems** such as pumps, compressors, lighting, and electrical machines.
- Introduce **energy conservation principles, standards, and regulatory framework** applicable in India.
- Train students to **conduct basic energy audits**, analyze losses, and recommend improvement measures.
- Familiarize students with **co-generation concepts, tariffs, and economic evaluation** for reducing energy costs.

COURSE OUTCOMES (CO):

After successful completion of this course, the students will be able to:

CO1: Explain concepts of energy efficiency, energy conservation, national energy scenario, and regulatory framework in India.

CO2: Apply energy-efficient practices and evaluate energy conservation opportunities in pumping systems, fans, and blowers.

CO3: Explain energy efficiency measures and loss-reduction techniques for air compressors and diesel generator sets.

CO4: Apply energy conservation techniques and innovative measures in industrial and commercial lighting systems.

CO5: Explain energy-efficient electrical machines, drives, co-generation concepts, and tariff systems for reducing energy losses and costs.

CO6: Conduct a basic energy audit, analyze energy flows and losses, and prepare an energy audit report with simple economic evaluation.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

Course Outcomes (COs)	PO1 Basics & Discipline Knowledge	PO2 Problem Analysis	PO3 Design & Development	PO4 Tools, Experimentation & Testing	PO5 Socio-Economic/ Environmental	PO6 Project Mgmt & Communication	PO7 Life-long Learning	PSO 1	PSO 2
CO1	3	1	–	–	2	–	1	*	*
CO2	2	3	1	1	2	1	1	*	*
CO3	2	2	1	1	2	1	1	*	*
CO4	2	2	–	–	1	1	1	*	*
CO5	2	2	1	–	3	–	1	*	*
CO6	2	3	–	–	2	2	–	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

* PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

COURSE CONTENT

UNIT – 1 **(4 Periods)**

Introduction to Energy Efficiency
Energy Scenario: Energy demand and supply, National scenario.
Energy Efficiency and Energy Conservation; concepts
Indian Electricity Act 2001; relevant clauses of energy conservation
BEE and its Roles
Star Labelling: Need and its benefits.

UNIT – 2 **(5 Periods)**

Pumping Systems, Fans and Blowers
Factors affecting pump performance
Efficient Pumping system operation
Energy conservation opportunities in Pumping systems
Fan types, flow control strategies
Fan performance Assessment
Energy Conservation opportunities in Pumping systems
Tips for energy saving in fans and blowers

UNIT – 3 **(5 Periods)**

Air Compressors and Diesel Power Generator sets
Classification of compressors
Pneumatic System components
Effect of various parameters on efficiency of Compressor
Capacity control of Compressors
Checklist for Energy Efficiency in Compressed air systems
Operating guidelines for diesel generator, operational factors
Effects of improper ventilation of genset
Energy saving measures for DG sets

UNIT –4 **(4 Periods)**

Energy Conservation in Lighting System
Replacing Lamp sources
Using energy efficient luminaries
Using light controlled gears
Installation of separate transformers / servo stabilizer for lighting
Periodic survey and adequate maintenance programs
Innovative measures of energy savings in lighting

UNIT– 5 **(6 Periods)**

Energy Efficient Electrical Machines

Need for energy conservation induction motor and transformer

Energy conservation techniques in induction motor by:

Energy conservation techniques in Transformer

Energy Conservation Equipment: Soft starters, Automatic star delta converter, Variable Frequency Drives, Automatic p. f. controller (APFC)

Energy efficient motor; significant features, advantages, applications and Limitations

Energy efficient transformers, amorphous transformers; epoxy Resin cast transformers / Dry type of transformer

Aggregated Technical and commercial losses (ATC), Technical losses; causes and measures to reduce, Commercial losses: pilferage, causes and remedies

Application of tariff system to reduce energy bill

Co-generation and Tariff; concept, significance for energy conservation

UNIT– 6 **(4 Periods)**

Energy Audit of Electrical Systems

Energy audit (definition as per Energy Conservation Act)

Energy audit instruments and their use

Questionnaire for energy audit projects

Energy flow diagram (Sankey diagram)

Simple payback period, Energy Audit procedure (walk through audit and detailed audit).

Energy Audit report format.

INSTRUCTIONAL STRATEGY

- Teachers should focus on conceptual clarity.
- An industrial visit can be organized in relevant industries. Audio-visuals aids should be used to teach.

MEANS OF ASSESSMENT

- Assignments and quiz/class tests
- Seminar, Presentation, Viva-voce.

RECOMMENDED BOOKS

1. Guidebooks No. 1 and 3 for National Certification Examination for Energy Managers and Energy Auditors, Bureau of Energy Efficiency (BEE), Bureau of Energy Efficiency (Statutory body under Ministry of Power, Government of India) (Fourth Edition 2015).
2. O.P. Gupta, Energy Technology, Khanna Publishing House, Delhi, Edition 2018, (ISBN: 978-93-86173-683).
3. Henderson, P. D., India - The Energy Sector, University Press, Delhi, 2016. ISBN: 978-0195606539
4. Turner, W. C., Energy Management Handbook, Fairmount Press, 2012, ISBN

9781304520708
5. Sharma, K. V., Venkataseshaiah; P., Energy Management and Conservation, I K International Publishing House Pvt. Ltd; 2011 ISBN 9789381141298
6. Mehta,V. K., Principles of Power System, S. Chand andCo.New Delhi, 2016, ISBN 9788121905947
7. Singh, Sanjeev; Rathore, Umesh, Energy Management, S K KatariaandSons, New Delhi ISBN-13: 9789350141014.
8. Desai, B. G.; Rana, J. S.; A. Dinesh, V.; Paraman, R., Efficient Use and Management of Electricity in Industry, Devki Energy Consultancy Pvt. Ltd.
9. Chakrabarti, Aman, Energy Engineering and Management, e-books Kindle Edition

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time allotted (Periods)	Marks Allotted (%)
1.	04	15
2.	05	17
3.	05	17
4.	04	15
5.	06	21
6.	04	15
Total	**28**	**100**

AUDIT COURSE	4.7 ESSENCE OF INDIAN KNOWLEDGE AND TRADITION	L	T	P
		2	-	-

COURSE OBJECTIVES:

Understand the fundamental aspects of the Indian Knowledge System, its integration with modern science, principles of Yoga and holistic healthcare, and practical applications in contemporary contexts.

COURSE OUTCOMES(CO) :
At the end of the course, the student will be able to:

CO1: Explain the foundational structures of the Indian Knowledge System, including the Vedas, Upavedas, Vedangas, and Upangas, and discuss their historical significance.
CO2: Relate ancient Indian scientific and technological achievements to modern science and analyze the convergence of science and spirituality.
CO3: Describe the basic principles of Yoga and Holistic Healthcare and evaluate their benefits and potential for integration with modern medicine.
CO4: Analyze case studies to demonstrate the contemporary relevance and practical application of Indian Knowledge Systems in solving modern problems.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Engineering Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	1	-	-	-	3	-	2	*	*
CO2	2	2	-	-	2	-	2	*	*
CO3	-	-	-	-	3	2	3	*	*
CO4	1	2	2	-	3	1	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)
***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

COURSE CONTENTS

UNIT 1: INTRODUCTION TO INDIAN KNOWLEDGE SYSTEM (16 Periods)

Overview of Indian Knowledge System

Importance and relevance

1. Introduction to the Vedas
2. Upavedas
3. Vedangas
4. Upangas

UNIT 2: MODERN SCIENCE AND INDIAN KNOWLEDGE SYSTEM (06 Periods)

1. Relevance of Science and Spirituality,
2. Science and Technology in Ancient India,

UNIT 3: YOGA AND HOLISTIC HEALTHCARE (04 Periods)

1. Basic principles of Yoga
2. Benefits of holistic healthcare practices
3. Integration with modern healthcare

UNIT 4: CASE STUDIES / ASSIGNMENT (02 Periods)

Practical Applications / Case studies demonstrating the relevance of Indian Knowledge System in modern times.

INSTRUCTIONAL STRATEGY

This being one of the most important subject, teacher should lay emphasis on developing basic understanding of various concepts and principles and procedures involved herein. Teacher should involve students in different practices like meditation, yoga camp etc.

MEANS OF ASSESSMENT

- Viva -Voce Exam

RECOMMENDED BOOKS

1. Cultural Heritage of India-Course Material, V. Sivaramakrishna, Bharatiya Vidya Bhavan, Mumbai, 5th Edition, 2014
2. Modern Physics and Vedant, Swami Jitatmanand, Bharatiya Vidya Bhavan
3. Science of Consciousness Psychotherapy and Yoga Practices, R N Jha, Vidyanidhi Prakasham, Delhi, 2016.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time allotted (Periods)	Marks Allotted (%)
1.	16	50
2.	06	20
3.	04	15
4.	02	15
Total	**28**	**100**

THEORY	5.1 TEXTILE TESTING & QUALITY CONTROL	L	T	P
		3	-	-

COURSE OBJECTIVE

The Textile Testing & Quality Control course equips students with the fundamental knowledge and practical understanding of testing methods essential for ensuring textile quality and performance. It emphasizes principles of quality, quality control (QC), and quality assurance (QA), including accuracy, precision, and reproducibility. Students learn about yarn and fabric testing techniques, including measurement of yarn count, twist, hairiness, fabric strength, tensile and tear properties, abrasion resistance, drape, stiffness, and dimensional stability. The course also covers blend analysis and estimation of textile compositions, highlighting the importance of representative sampling, instrument calibration, and standard testing conditions. By the end of the course, students gain the ability to evaluate textile materials systematically, interpret test results, and make informed decisions for product development and quality improvement.

COURSE OUTCOMES (CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following.

Students will be able to

CO1 □ Understand the principles and objectives of textile testing, quality control, quality assurance, and the role of standard testing conditions.

CO2 □ Analyze yarn properties including count, twist, unevenness, and hairiness, and evaluate their impact on fabric quality.

CO3□ Measure and evaluate general fabric properties such as GSM, thickness, crimp, tensile strength, tear strength, bursting strength, and air permeability.

CO4 □ Assess mechanical performance and stability of fabrics, including abrasion resistance, drape, stiffness, dimensional stability, and resistance to water and perspiration.

CO5 □ Determine blend composition in textile materials using chemical and analytical methods, and understand the characteristics of common textile blends.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	-	3	1	-	2	*	*
CO2	3	3	2	3	1	-	2	*	*
CO3	3	3	2	3	1	-	2	*	*
CO4	3	3	3	3	1	-	2	*	*
CO5	3	3	3	3	1	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

UNIT-1(INTRODUCTION TO TEXTILE TESTING) (05 Periods)

Definition and objectives of Textile Testing, Scope and importance of testing in textile design, Definition of Quality, Quality Control (QC), and Quality Assurance (QA), Accuracy, precision, and reproducibility, Sampling: need, methods, and importance of representative samples, Conditioning and standard testing atmosphere (temperature and humidity), Calibration and maintenance of testing instruments, Difference between qualitative and quantitative tests, Concept of destructive and non-destructive testing

UNIT-2 (YARN TESTING) (09 Periods)

Yarn count: concept, systems of numbering, and methods of determination, Yarn twist: S and Z twist, turns per inch (TPI), Measurement of twist and introduction to twist measuring machines, CSP Concept. Short, medium, and long-term variations; Classimate analysis, Impact of yarn unevenness and irregularities on fabric appearance, Yarn Hairness.

UNIT-3 (GENERAL FABRIC TESTING) (09 Periods)

Measurement of GSM (grams per square meter), fabric thickness, crimp.

Fabric strength testing, tensile, tear and bursting, Air permeability, crease recovery.

UNIT- 4 FABRIC TESTING – MECHANICAL PERFORMANCE & STABILITY (10 Periods)

Water proof and water repellency tests, Abrasion resistance,

Concept of drape: measurement and importance, Fabric Stiffness, Flexural rigidity,

Dimensional stability, bowing, skewness, and residual shrinkage: concepts and evaluation, to crocking, perspiration

UNIT-5 (BLEND ANALYSIS) (09 Periods)

Introduction to commonly used blends in textile industry and their characteristics - Polyester/Cotton, Cotton/Viscose, Cotton/Linen, Polyester/Viscose, Polyester/Wool, Acrylic/Wool, Wool/ Nylon, Estimation of blend composition by chemical methods - Wool/Nylon, Polyester/Cotton, Acrylic/Wool, Cotton/Viscose, Polyester/Viscose

INSTRUCTIONAL STRATEGY

- Physical Demonstration of various textile testing instruments.
- Visit may be conducted for students to different textile testing laboratories.
- Practical's and file preparation

MEANS OF ASSESSMENT

- Assignments and quizzes
- Mid-term and End-term written tests
- Mini Model or chart preparation
- Actual lab and practical work
- Viva-voce

RECOMMENDED BOOKS

1- "Principles of Textile Testing" by J.E. Booth
2- "Physical Testing of Textiles " by B.P. Saville
3-

SUGGESTED DISTRIBUTION OF MARKS

Unit	Time Allotted (Periods)	Marks Allotted (%)
1	5	12
2	5	12
3	5	12
4	9	22
5	9	22
6	9	20
Total	**42**	**100**

PRACTICAL	5.2 TEXTILE TESTING & QUALITY CONTROL	L	T	P
		-	-	6

COURSE OBJECTIVE

The Textile Testing & Quality Control course provides hands-on experience in evaluating the quality and performance of yarns and fabrics using standard instruments and methods. Students learn to determine yarn count, twist, strength, and uniformity, as well as fabric properties including GSM, thickness, crimp, tensile and tear strength, crease recovery, abrasion resistance, stiffness, drape, and color fastness. The practicals emphasize accurate measurement, interpretation of results, and understanding the influence of fiber and yarn properties on fabric performance. By completing this course, students gain the ability to perform standardized textile tests, analyze data critically, and apply testing knowledge to maintain quality and ensure the reliability of textile products.

COURSE OUTCOMES (CO):

The experiment should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following.

Students will be able to

CO1 □ Determine yarn count using various methods including wrap reel, quadrant balance, and Beasley yarn balance, understanding their applications and limitations.

CO2 □ Measure yarn twist, lea strength, and CSP to evaluate yarn quality and uniformity.

CO3□ Evaluate fabric physical properties such as GSM, thickness, and crimp, ensuring accurate measurement and recording.

CO4 □ Assess fabric mechanical performance including tensile strength, tear strength, crease recovery, abrasion resistance, stiffness, and drape.

CO5 □ Test color and surface performance, such as rubbing fastness, and interpret results to maintain quality standards

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	-	3	1	-	2	*	*
CO2	3	3	2	3	1	-	2	*	*
CO3	3	3	3	3	1	-	2	*	*
CO4	3	3	3	3	1	-	2	*	*
CO5	3	3	3	3	1	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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LIST OF PRACTICAL

1. To find the count of yarn by using wrap reel and physical balance. **(6 Periods**)
2. To find the count of the yarn using Quadrant balance. **(6 Periods)**
3. To find the count of the yarn using Beasley yarn balance. **(6 Periods)**
4. Determine the twist of yarn per inch/per meter in double yarn and its individual components by twist tester. **(6 Periods)**
5. Find out lea strength of cotton yarn by lea strength tester (Power driven) and CSP. **(06 Periods)**
6. Measurement of GSM of given fabric using GSM Round Cutter and Weighing balance. **(6 Periods)**
7. Measurement of Fabric Thickness using Fabric Thickness tester. **(6 Periods)**
8. Measurement of crimp in the fabric using crimp tester. **(6 Periods)**
9. Measurement of Fabric Tensile strength using fabric tensile strength tester. **(6 Periods)**
10. Measurement of Fabric Tear strength using fabric tear strength tester. **(6 Periods)**
11. Measurement of Crease recovery of fabric using crease recovery tester. **(6 Periods)**
12. Measurement of Abrasion resistance of fabric using abrasion resistance tester. **(6 Periods)**
13. Measurement of Fabric stiffness and Drape coefficient of fabric. **(6 Periods)**
14. Measurement of Rubbing fastness of the fabric using a crock meter. **(6 Periods)**

RECOMMENDED BOOKS

1. “Principles of Textile Testing” by J.E. Booth
2. “Physical Testing of Textiles ” by B.P. Saville

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THEORY	5.3 TEXTILE DESIGN - II	L	T	P
		3	-	-

COURSE OBJECTIVE

The Textile Design – II course equips students with the skills to develop innovative and functional textile designs for woven and printed fabrics. The course emphasizes understanding pattern development through color and weave effects, the application of design principles, and the creation of motifs such as diamond ogee, half-drop, and reverse patterns. Students learn to modify colors effectively, transfer designs accurately onto graph paper, and integrate weaves in figured and ground portions. The course also introduces functional design applications for apparel and furnishing, enabling students to create aesthetically appealing and commercially viable textile products while adhering to quality standards and design principles.

COURSE OUTCOMES (CO):

The experiment should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following.

Students will be able to

CO1 Develop textile patterns by integrating color effects and weave structures.
CO2 Apply elements and principles of design to create decorative motifs for woven and printed fabrics.
CO3 Construct basic textile design patterns such as diamond ogee, curved line half-drop, and reverse motifs.
CO4 Modify and adapt colors in textile designs to achieve desired visual effects.
CO5 Transfer designs accurately onto graph paper, incorporating edging and weave insertions in figured and ground areas.
CO6 Design functional textile items for specific applications in apparel and furnishing, demonstrating creativity and usability.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	3	2	1	-	2	*	*
CO2	3	3	2	2	1	-	2	*	*
CO3	3	3	3	3	1	-	2	*	*
CO4	3	2	3	3	1	-	2	*	*
CO5	3	3	3	3	1	-	2	*	*
CO6	3	3	3	3	1	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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DETAILED CONTENTS

UNIT – 1 **(7 Periods)**

Development of pattern by colour and weave effect.

UNIT – 2 **(7 Periods)**

Elements and principles of preparing decorative designs for woven and printed fabrics

UNIT – 3 **(7 Periods)**

Basis of textile design like diamond ogee, curved line half drop, reverse etc.

UNIT – 4 **(5 Periods)**

Ways of modifying colours in textiles.

UNIT – 5 **(8 Periods)**

Transfering of design on graph Paper, edging and insertion of weaves in figured protion and on ground.

UNIT – 6 **(8 Periods)**

Types of design functional items designed for a specific purpose that may include examples from the following focus areas.

1. Apparel
2. Furnishing

INSTRUCTIONAL STRATEGY

Student should be encouraged to participate in role play and other student centred activities in class room and actively participate in listening exercises

MEANS OF ASSESSMENT

- Assignments and quiz/class tests, mid-semester and end-semester written tests
- Actual practical work, exercises and viva-voce
- Presentation and viva-voce

RECOMMENDED BOOKS

1. Fabric Structure and Design by N.Gokarveshan
2. Watson’s textile design & colour by Z.J.Grosicki.
3. Woven fabric structure design and product planning by Dr. J. Hayavadana
4. Mastering weaves structure- Sharon Alderman-Inter weave Press.
5. Advance Textile Design & coulour by Watson’s

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SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	7	15
2	7	15
3	7	15
4	5	15
5	8	20
6	8	20
Total	**42**	**100**

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PRACTICAL	5.4 TEXTILE DESIGN - II	L	T	P
		-	-	6

COURSE OBJECTIVE

The Textile Design – II course develops students' hands-on skills in creating functional and aesthetically appealing textile designs. Students gain practical experience in pattern development using color and weave effects, applying design elements and principles to woven and printed fabrics. The course emphasizes construction of basic textile motifs such as diamond ogee, half-drop, and reverse patterns, color modification techniques, and accurate transfer of designs onto graph paper with proper edging and weave insertion. Additionally, students design functional textile products for apparel and furnishing, bridging creativity with real-world application and quality standards.

COURSE OUTCOMES (CO):

The experiment should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following.

Students will be able to

CO1 Create textile patterns integrating color effects and weave structures.
CO2 Apply design elements and principles to develop decorative motifs for woven and printed fabrics.
CO3 Construct basic textile designs including diamond ogee, curved line half-drop, and reverse motifs
CO4 Modify colors effectively to achieve desired visual and functional outcomes.
CO5 Transfer designs accurately onto graph paper, incorporating edging and weave insertions.
CO6 Design functional textile items for apparel and furnishing, demonstrating practical creativity.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	3	2	-	-	2	*	*
CO2	3	3	3	2	-	-	2	*	*
CO3	3	3	3	3	-	-	2	*	*
CO4	3	2	3	2	-	-	2	*	*
CO5	3	3	3	3	-	-	2	*	*
CO6	3	3	3	3	2	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

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LIST OF PRACTICAL

1. Development of pattern by colour and weave effect. **(14 Periods)**
2. Elements and principles of preparing decorative designs for woven and printed fabrics **(14 Periods)**
3. Basis of textile design like diamond ogee, curved line half drop, reverse etc. **(14 Periods)**
4. Ways of modifying colours in textiles. **(14 Periods)**
5. Transfering of design on graph Paper, edging and insertion of weaves in figured portion and on ground. **(14 Periods)**
6. Types of design functional items designed for a specific purpose that may include examples from the following focus areas. **(14 Periods)**
    a) Apparel
    b) Furnishing

RECOMMENDED BOOKS

1. Fabric Structure and Design by N.Gokarveshan
2. Watson's textile design & colour by Z.J.Grosicki.
3. Woven fabric structure design and product planning by Dr. J. Hayavadana
4. Mastering weaves structure- Sharon Alderman-Inter weave Press.
5. Advance Textile Design & coulour by Watson's.

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THEORY	5.5 TREND RESEARCH & FORECASTING (POE-2)	L	T	P
		3	-	-

COURSE OBJECTIVE

The Trend Research & Forecasting course equips students with the knowledge and skills to analyze, interpret, and anticipate trends in textiles and fashion. It introduces the fundamentals of trend research, including understanding the differences between fads, trends, and classics, the trend cycle, and its life span. Students learn to identify trend sources through designers, brands, media, trade fairs, and street culture, while studying market directions, consumer behavior, and market segmentation. The course also examines the impact of cultural, social, and technological shifts on trends, emphasizing sustainability and ethical considerations. Finally, students gain introductory skills in trend forecasting techniques, including qualitative and quantitative methods, color and material forecasting, and the preparation of theme and concept boards to support informed design and product planning.

COURSE OUTCOMES (CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following.

Students will be able to

CO1 Understand the fundamentals of trend research and differentiate between fad, trend, and classic.
CO2 Identify and analyze sources of trends including designers, media, trade fairs, and street culture.
CO3 Evaluate market directions, consumer behavior, and segmentation for informed textile and fashion planning.
CO4 Examine cultural, social, and technological influences on trends, including sustainability and ethical considerations.
CO5 Apply basic trend forecasting techniques, including color and material forecasting, and develop theme and concept boards.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	2	-	-	-	2	*	*
CO2	3	3	2	-	-	-	2	*	*
CO3	3	3	3	-	-	-	2	*	*
CO4	3	2	3	-	3	-	2	*	*
CO5	3	3	3	3	2	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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UNIT–1 : INTRODUCTION TO TREND RESEARCH (09 Periods)

- Meaning and definition of trend
- Difference between fad, trend and classic
- Importance of trend research in textile and fashion industry
- Role of trend forecasting in design and product planning
- Trend cycle and life span of a trend
- Scope of trend research for textile designers

UNIT–2 : SOURCES OF TRENDS (09 Periods)

- Designers, brands and fashion leaders
- Media and communication channels
- Trade fairs, exhibitions and fashion shows
- Street fashion and youth culture

UNIT–3 : MARKET DIRECTIONS AND CONSUMER BEHAVIOUR (08 Periods)

- Meaning of market direction
- Understanding consumer needs and preferences
- Market segmentation

UNIT–4 : CULTURAL AND SOCIAL SHIFTS (08 Periods)

- Meaning of culture and cultural change
- Influence of tradition, heritage and craft on trends
- Impact of social changes on textile and fashion trends
- Role of technology and digital culture
- Sustainability and ethical considerations as emerging trends

UNIT–5 : TREND FORECASTING TECHNIQUES (08 Periods)

- Meaning and objectives of trend forecasting
- Short-term and long-term forecasting
- Qualitative and quantitative forecasting methods (introductory level)
- Colour forecasting and material forecasting
- Development of theme and concept boards
- Role of trend forecasting agencies (overview)

INSTRUCTIONAL STRATEGY

- Classroom lectures supported by visual references
- Analysis of trend reports and case studies
- Group discussions and presentations
- Preparation of trend boards and concept sheets
- Field visits to markets, exhibitions or fairs (where possible)

MEANS OF ASSESSMENT

- Internal assessment through class tests
- Assignments on trend research

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- Preparation and evaluation of trend boards
- Student presentations
- End-semester theory examination

RECOMMENDED BOOKS

1. Fashion Forecasting – Evelyn L. Brannon
2. The Fashion Handbook – Tim Jackson
3. Textile and Fashion Trend Analysis – B. L. Gupta
4. Fashion Marketing and Merchandising – S. Ramesh
5. Industry trend reports and fashion journals (for reference)

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time allotted (Periods)	Marks allotted (%)
1	09	21
2	09	21
3	08	19
4	08	19
5.	08	20
Total	42	**100**

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THEORY	5.5 KNIT-WEAR TECHNOLGY (POE-2)	L	T	P
		3	-	-

COURSE OBJECTIVE

The Knit-Wear Technology course provides students with a comprehensive understanding of knitted fabrics, including their properties, structures, and manufacturing technologies. Students learn to differentiate between woven and knitted fabrics, understand warp and weft knitting classifications, and gain knowledge of needle types and their applications. The course covers weft knit structures, their symbolic representation, ornamentation, and derivatives of plain knits. Detailed study of weft and warp knitting machines, including operation cycles, knitting elements, and machine types, equips students with practical knowledge of production processes. Additionally, students learn to identify common fabric defects in warp and weft knits, their causes, and remedies, along with basic production calculations, preparing them for effective design and quality control in knitwear manufacturing.

COURSE OUTCOMES (CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following.

Students will be able to

CO1 Understand the properties of knitted fabrics, classification of knitting machines, and comparison between woven and knitted fabrics

CO2 Identify and analyze weft knit structures, their features, symbolic representation, ornamentation, and derivatives of plain knits.

CO3 Explain the operation cycles, knitting elements, and mechanisms of weft knitting machines including plain, rib, interlock, and purl machines.

CO4 Describe warp knitting machines, including tricot and raschel machines, their parts, knitting cycles, and fabric comparisons.

CO5 Detect common warp and weft knit fabric defects, suggest remedies, and perform basic production calculations.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	2	-	-	-	2	*	*
CO2	3	3	3	-	-	-	2	*	*
CO3	3	3	3	2	-	-	2	*	*
CO4	3	2	3	2	3	-	2	*	*
CO5	3	3	3	-	2	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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UNIT-1 **(8 Periods)**

Introduction: Properties of Knitted Fabrics, Comparison of woven and knitted, Terms and Definitions, Classification of Warp and Weft knitting machines, Comparison of Warp and Weft knitting, Needle Types: Needle Types - Latch needle, Bearded Needle, Compound needle, Advantages and disadvantages of different needles.

UNIT-2 **(9 Periods)**

Weft Knit Structures: Symbolic representation, Features and Properties of Plain Single Jersey, Rib-, Interlock and Purl knit structures Designing of Weft Knit Structures Ornamentation of Plain-knit Fabrics Derivatives of plain knit (Single Jersey) – Knit and float, knit and tuck, knit, float and tuck.

UNIT-3 **(9 Periods)**

Weft Knitting Machines Plain Single Jersey knitting machine – Knitting Elements - Cams, Cylinder, Feed yarn carriers, Take-up mechanisms; Operation Cycle – Clearing, Feeding, Knitting Position Circular Rib knitting machine – Operation Cycle – Rest, Clearing, Feeding, Knitting Position Circular Interlock knitting machine– Operation Cycle Purl knitting machine – Operation Cycle.

UNIT-4 **(8 Periods)**

Warp Knitting Machines knitting Classification –Tricot Machine, Raschel Machine – Main machines Parts, knitting elements, Knitting cycle Comparison of Tricot and Raschel Fabrics.

UNIT-5 **(8 Periods)**

Fabric Defects: Warp and Weft knit defects and their remedies, Production calculation.

INSTRUCTIONAL STRATEGY

Teachers should take theory lectures, demonstration of concepts and prototype

MEANS OF ASSESSMENT

- Assignments and quiz/class tests
- Mid-term and end-term written tests

BOOKS RECOMMENDED

1. Spencer D J, “Knitting Technology”, 2nd Ed., Pergamon Press (1989)
2. Ajgaonkar D B, ―Knitting Technology‖, Universal Publishing Corporation (1998).
3. Reichman Charles, Lancashire J B and Darlington K D, ―Knitted Fabric Primer‖, National Knitted outwear Association, New York (1967).

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SUGGESTEDDISTRIBUTIONOF MARKS

Topic No.	Time allotted (Periods)	Marks allotted (%)
1	8	19
2	9	22
3	9	21
4	8	19
5.	8	19
Total	**42**	**100**

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THEORY	5.6 FABRIC MANUFACTURING PROCESS – II (POE-3)	L	T	P
		3	-	-

COURSE OBJECTIVE

The Fabric Manufacturing Process – II course equips students with in-depth knowledge of advanced weaving and knitting technologies. It covers primary, secondary, and auxiliary motions in weaving, as well as the operation and applications of drop box, dobby, and jacquard mechanisms. The course introduces knitted fabrics and familiarizes students with warp and weft knitting machines, highlighting their structure and working principles. Students also gain an understanding of modern shuttle-less weaving machines, including projectile, air-jet, water-jet, and rapier looms, their principles, and advantages. By the end of the course, students will be able to analyze fabric manufacturing processes, understand machinery operation, and integrate this knowledge into efficient fabric production and design decisions.

COURSE OUTCOMES (CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following.

Students will be able to

CO1 Understand primary, secondary, and auxiliary motions in weaving and their role in fabric formation.
CO2 Explain the working principles, applications, and differences of drop box, dobby, and jacquard mechanisms..
CO3 Identify various types of knitted fabrics and understand the operation of warp and weft knitting machines.
CO4 Describe the principles, working, and advantages of modern shuttle-less weaving machines including projectile, air-jet, water-jet, and rapier looms.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	2	-	-	-	2	*	*
CO2	3	3	2	2	-	-	2	*	*
CO3	3	3	3	3	-	-	2	*	*
CO4	3	3	3	3	3	-	3	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)
***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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DETAILED CONTENTS

UNIT-1 **(10 Periods)**

Primary, Secondary and Auxillary motions in weaving process**.**

UNIT-2 **(10 Periods)**

Brief study of drop box, dobby and jacquard**.**

UNIT-3 **(10 Periods)**

Introduction to knitted fabrics and various types of knitting machines (Warp knit and Weft knit machines only)

UNIT-4 **(12 Periods)**

Introduction & Principles of Modern Weaving Machines (Shuttle less looms) i.e Projectile, Air jet, water jet and Rapier looms.

INSTRUCTIONAL STRATEGY

Student should be encouraged to participate in role play and other student centred activities in class room and actively participate in listening exercises

MEANS OF ASSESSMENT

- Assignments and quiz/class tests, mid-semester and end-semester written tests
- Actual practical work, exercises and viva-voce
- Presentation and viva-voce

RECOMMENDED BOOKS

1. Weaving mechanism I & II, by N.N. Banerjee
2. Fabric manufacturing I & II by NCUTE
3. Wearing by Talukdar

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	10	23
2	10	23
3	10	23
4	12	31
Total	**42**	**100**

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THEORY	5.6 INDUSTRIAL SAFETY (POE-3)	L	T	P
		3	-	-

COURSE OBJECTIVE

The course aims to provide students with a thorough understanding of industrial safety principles and practices in the textile industry. It covers the importance of safe working conditions, legal and humanitarian considerations, and cost implications of accidents. Students will learn accident prevention theories, identification of unsafe acts and conditions, and methods to mitigate hazards in spinning, weaving, and chemical processing operations. The course also emphasizes the safe handling of materials, machine guarding, ergonomics, electrical safety, fire prevention, and health and welfare measures. Additionally, students will gain knowledge of relevant safety statutes, environmental regulations, and statutory provisions to ensure compliance and promote a safe, productive, and sustainable workplace.

COURSE OUTCOMES(CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following

Students will be able to

CO1 Understand the importance of industrial safety, its economic, social, and humanitarian impact, and the role of management and workers in promoting a safe workplace..

CO2 Identify accidents, unsafe acts, unsafe conditions, and hazards, and apply principles and methods of accident prevention.

CO3 Analyze safety requirements in spinning, weaving, and other textile operations, including machine guarding, incidental safety devices, and ergonomics of workstations.

CO4 Apply safety precautions in chemical processing, including bleaching, dyeing, printing, finishing, and management of chemical hazards and effluents.

CO5 Implement safety engineering principles for material handling, electrical safety, fire prevention, illumination, and health and welfare measures in the textile industry.

CO6 Understand relevant safety statutes, environmental regulations, and legislative provisions to ensure compliance and promote a safe and sustainable industrial environment.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	-	3	2	-	2	*	*
CO2	3	3	2	3	2	-	2	*	*
CO3	3	2	-	2	2	-	2	*	*
CO4	3	3	2	3	3	-	2	*	*
CO5	3	2	-	2	3	-	2	*	*
CO6	3	2	2	-	3	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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COURSE CONTENTS

UNIT-1 Introduction: (5 Periods)

Need for Industrial Safety - Legal Humanitarian, Economic and Social consideration. Safe working conditions and productivity, Unsafe conditions and Hazards. Cost of accidents- Direct or Indirect social cost, financial cost. Role of management and workers participation in Industrial Safety. Safety management principles and practices.

UNIT-2 Principles Of Accident Prevention: (6 Periods)

Definitions - Accident, Injury, Dangerous occurrences, Unsafe acts, Unsafe conditions and hazards. Theories of accidents prevention, Principles and methods of accidents preventions.

UNIT-3 Safety Precautions in Spinning and Weaving: (8 Periods)

Safeguarding of machines- Statutory provisions related to safeguarding of machinery and working near unguarded machines. Ergonomics of machine guarding. Types of guards and guarding machines in the textile industry. Incidental safety devices. Guarding of machines and safety precautions in Opening, Cleaning, Carding, Drawing, Combing, Fly frame, Ring frames, Rotors (spinning), Winding, Doubling, Warping, Sizing and Weaving operations.

UNIT-4 Safety Precaution in Chemical Process: (8 Periods)

Safety Precautions in Bleaching, Dyeing, Printing, Finishing and Accidental Hazards. Chemical Hazards in Wet Processing. Effluent in textile processing.

UNIT-5 Safety Engineering (10 Periods)

Material Handling:
Ergonomics of material handling, principles of correct methods of lifting objects of different sizes, shapes, and weights with safe use of accessories for manual handling.

Safety aspects of design, construction, and use of material handling machinery used in the textile industry – lifts, forklifts, motor trolleys, overhead cranes, and chain pulleys.

Principles of good illumination at the workplace and its recommended minimum standards. Lighting and colour.

Danger From Electricity:
Safe limits of amperage and voltages. Means for cutting overloads and short circuit protection. earth fault protection. Protection of joints and conductors.

Fire explosion, Common cause for industrial fire detection and alarm. Knowledge of water system, Carbon Dioxide System, Foam Extinguishers system and Dry Chemical Extinguishing Systems for extinguishing fire, Sprinklers.

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Health and Welfare:

Health hazards in Textile industry, Occupational diseases. Personal production equipments. Special precautions for specific work environment.

UNIT-6. Safety Statutes: (5 Periods)

Employees' welfare and legislation. Indian Boiler Act and Regulation. The Water (Control of Pollution) Act and Rules. The Air (Pollution) Act and Rules. The Noise (Pollution) Act and Rules.

INSTRUCTIONAL STRATEGY

Teachers should take lectures on theory, demonstrate concepts and prototypes

MEANS OF ASSESSMENT

- Assignments and quiz/class tests
- Mid-term and end-term written tests

BOOKS RECOMMENDED

1. Health and Safety for Textile Industry by R Vettriselvan, T Jeya Sudha
2. A Textbook on Industrial Safety by Harsimran Singh Sodhi, Doordarshi Singh

Websites for Reference:

1. https://nptel.ac.in/

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	5	10
2	6	12
3	8	20
4	8	20
5	10	28
6	5	10
Total	**42**	**100**

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AUDIT COURSE	5.7 INDIAN CONSTITUTION	L	T	P
		2	-	-

COURSE OBJECTIVES:

To provide a comprehensive understanding of the Indian Constitution's history and philosophy, and to familiarize them with the administrative structure, powers, and functions of the Union, State, and Local governments, along with the Judiciary and Election Commission.

COURSE OUTCOMES:

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: Explain the making of the Indian Constitution, interpret the Preamble, and discuss the significance of Fundamental Rights and Duties.

CO2: Describe the structure of the Union Executive, detailing the powers and roles of the President, Prime Minister, and Council of Ministers.

CO3: Distinguish between the functions of the Lok Sabha and Rajya Sabha and explain the jurisdiction and structure of the Supreme Court.

CO4: Discuss the administrative framework of State Governments, focusing on the roles of the Governor, Chief Minister, and State Secretariat.

CO5: Outline the hierarchy and functions of Local Administration, including District Administration, Municipal Corporations, and Zila Panchayats.

CO6: Examine the structure of the Election Commission of India and its critical role in conducting free and fair elections.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Engineering Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	-	-	-	-	3	1	3	*	*
CO2	-	-	-	-	2	2	2	*	*
CO3	-	-	-	-	3	1	2	*	*
CO4	-	-	-	-	2	2	2	*	*
CO5	-	-	-	-	3	2	2	*	*
CO6	-	-	-	-	3	1	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

* PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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COURSE CONTENT

UNIT – I: THE CONSTITUTION – INTRODUCTION **(06 Periods)**

The History of the Making of the Indian Constitution
Preamble and the Basic Structure, and its interpretation
Fundamental Rights and Duties and their interpretation

UNIT – II: UNION GOVERNMENT **(06 Periods)**

Structure of the Indian Union Government
President – Election, Role and Power
Prime Minister and Council of Ministers

UNIT – III: INDIAN LEGISLATURE & JUDICIARY **(06 Periods)**

Composition of Lok Sabha and Rajya Sabha
Powers & Functions of Lok Sabha and Rajya Sabha
Structure of Supreme Court including Appointment of Judges
Powers & Functions of Supreme Court

UNIT – IV: STATE GOVERNMENT **(03 Periods)**

Governor – Role and Power
Chief Minister and Council of Ministers
State Secretariat

UNIT – V: LOCAL ADMINISTRATION **(04 Periods)**

District Administration
Municipal Corporation
Zila Panchayat

UNIT – VI: ELECTION COMMISSION **(03 Periods)**

Structure of Election Commission of India
Role and Function of Election Commission

INSTRUCTIONAL STRATEGY

Teach the Indian Constitution through interactive methods like case studies, debates, and role-plays to engage students. Use visuals and simplified texts to explain key features like fundamental rights and

duties. Encourage discussions on amendments and landmark judgments. Incorporate quizzes and group projects to foster critical thinking and civic awareness.

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MEANSOF ASSESSMENT

- Class test/quizzes
- Home assignments
- Attendance
- Sessional Test
-

RECOMMENDED BOOKS:

1. Ethics and Politics of the Indian Constitution Rajeev Bhargava Oxford University Press, New Delhi, 2008
2. The Constitution of India B.L. Fadia Sahitya Bhawan; New edition (2017)
3. Introduction to the Constitution of India DD Basu Lexis Nexis; Twenty-Third 2018 edition
4. Our Constitution Subhash Chand Kashyap NBT New Delhi.

SUGGESTED SOFTWARE/LEARNING WEBSITES:

1.1.https://www.constitution.org/cons/india/const.html
1.2.http://www.legislative.gov.in/constitution-of-india
1.3.https://www.sci.gov.in/constitution
1.4.https://www.toppr.com/guides/civics/the-indian-constitution/the-constitution-of-india/
1.5.https://ncert.nic.in/textbook.php

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (periods)	Marks Allotted (%)
1	6	20
2	6	20
3	6	20
4	3	12
5	4	16
6	3	12
Total	**28**	**100**

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THEORY	6.1 PROFESSIONAL STUDIES	L	T	P
		4	-	-

COURSE OBJECTIVE

The Professional Studies course aims to equip textile and fashion students with practical knowledge of the professional and business aspects of the textile industry. It provides an understanding of the Indian textile industry, its organizational structure, and the challenges faced by designers, including sociological, psychological, and financial issues. The course covers essential management principles, marketing strategies, client relationship management, costing methods, and setting up a design studio. By integrating theoretical knowledge with practical exercises and role-play, students develop managerial skills, business acumen, and professional competence required to succeed as designers and industry professionals.

COURSE OUTCOMES(CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following COURSE OUTCOMES.

Students will be able to

CO1 Explain the organization, structure, and challenges of the Indian textile industry and suggest solutions for designers' problems.

CO2 Understand the principles, nature, and functions of management and their application in design business

CO3 Demonstrate knowledge of marketing management, including market research, product planning, sales promotion, and pricing.

CO4 Develop skills in client interaction, liaising, and maintaining professional human relations while understanding social responsibilities.

CO5 Analyze cost components including material, labor, overheads, and types of costing for effective business decision-making..

CO6 Understand the requirements and planning necessary to set up a functional design studio.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	3	2	-	-	-	2	*	*
CO2	3	2	2	-	1	-	2	*	*
CO3	3	2	3	-	1	-	2	*	*
CO4	3	3	2	-	2	-	2	*	*
CO5	3	2	3	-	2	-	2	*	*
CO6	3	3	2	-	3	-	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

UNIT-1 **(10 Periods)**

A brief idea about Textile Industry in India and its organisation. Problems faced by Designers, Sociological-psychological, Financial steps necessary to overcome them**.**

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UNIT-2 **(10 Periods)**

Nature of management, functions of management. The science and Art of management. (Brief ideas).

UNIT-3 **(10 Periods)**

Principles of Marketing management. Nature and importance, Meaning of Marketing. Marketing Techniques and skills-Market Research Sales Promotion, Product Planning pricing.

UNIT-4 **(10 Periods)**

Establish liaising with clients. Need for liaising with clients. Types of clients, how to deal with them. Social responsibilities of business (From Designers point of view). Need for human relations.

UNIT-5 **(10 Periods)**

Costing : Elements of costs : Materials, labour expense, prime cost and overheads. Fixed and variable cost. Type of cost : predetermined, standard and marginal.

UNIT-6 **(6 Periods)**

Basic requirements for setup of Design studio.

INSTRUCTIONAL STRATEGY

Student should be encouraged to participate in role play and other student centered activities in class room and actively participate in listening exercises

MEANS OF ASSESSMENT

- Assignments and quiz/class tests, mid-semester and end-semester written tests
- Actual practical work, exercises and viva-voce
- Presentation and viva-voce

RECOMMENDED BOOKS

1. The art of Management by Shiv shivakumar
2. Managers who make a difference by TV Rao.
3. Business Sutra: A very Indian approach to management by Devdutt Pattanaik.
4. Marketing management by Kevin dane Keller.

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SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	10	18
2	10	18
3	10	18
4	10	18
5	10	18
6	06	10
Total	**56**	**100**

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THEORY	6.2 ENTREPRENEURSHIP AND START-UPS	L	T	P
		2	-	

COURSE OBJECTIVES:

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

- Acquiring Entrepreneurial spirit and resourcefulness.
- Familiarization with various uses of human resources for earning dignified means of living.
- Understanding the concept and process of entrepreneurship - its contribution and role in the growth and development of individuals and the nation.
- Acquiring entrepreneurial quality, competence, and motivation.
- Learning the process and skills of creation and management of entrepreneurial ventures.

COURSE OUTCOMES:

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: Explain the concept of entrepreneurship, classify business structures, and distinguish between the roles of an entrepreneur, intrapreneur, and manager.

CO2: Identify feasible business ideas using activity maps and develop a preliminary Business Plan based on case study analysis.

CO3: Analyze market strategies using STP and SWOT analysis, and formulate the Vision, Mission, and Objectives for a start-up.

CO4: Discuss the fundamental functions of management, organizational structures, and the processes of recruitment, selection, and training.

CO5: Select appropriate financing methods (Govt schemes, Venture Capital) and apply Intellectual Property Rights (IPR) concepts to protect business ideas.

CO6: Describe the strategies for business succession, harvesting, and the legal types of dissolution.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Engineering Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	-	-	-	-	2	3	2	*	*
CO2	-	2	2	-	1	3	2	*	*
CO3	-	2	2	-	2	3	2	*	*
CO4	-	-	-	-	1	3	1	*	*
CO5	-	2	-	-	2	3	2	*	*
CO6	-	-	-	-	1	3	1	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

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COURSE CONTENTS

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Unit – I: Introduction to Entrepreneurship and Start – Ups (05 Periods)

Definitions, Classification of Entrepreneur
Traits of an Entrepreneur, Entrepreneurship, Motivation
Types of Business Structures- On the Basis of size and on the basis of ownership
Similarities/differences between entrepreneurs and managers

Unit – II: Business Ideas and their implementation (04 Periods)

Discovering ideas and visualizing the business
Activity map
Business Plan (Case Study)

Unit – III: Ideas to Start-up (08 Periods)

Marketing and Accounting- Definition and Importance.
Market Analysis – STP (Segmentation, Targeting, Positioning)
Competition evaluation and Strategy Development – Vision, Mission, Goal, Objectives.
Risk analysis- SWOT Analysis.

Unit – IV: Management (06 Periods)

Definition Concept and Functions of Management
Company's Organization Structure- Concept and Classification
Recruitment and Selection- Definition,
Training and Development- Importance.

Unit – V: Financing and Protection of Ideas (03 Periods)

Financing methods available for Entrepreneurship/ Startups in India (Government Scheme, Banking, NBFCs, SHG and Micro Financing).
Intellectual Property Rights- Overview of - Copyrights, Trademark, Geographical Indicators, Patenting and Licenses
Communication of Ideas to potential investors – Investor Pitch.

Unit – V: Succession, Dissolution and Harvesting strategy (06 Periods)

Ways of succession
Types of Dissolution

INSTRUCTIONAL STRATEGY

Some of the topics may be taught using question/answer, assignment, seminar or case study method. The teacher will discuss stories and case studies with students, which in turn will develop appropriate managerial and entrepreneurial and start- up qualities in the students. In addition, expert lecturers may also be arranged by outside experts and students may be taken to nearby industrial organizations on visit. Approach extracted reading and handouts may be provided.

MEANS OF ASSESSMENT

- Assignments and quiz/class tests

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- Mid-term and end-term written tests
- Model/Prototype making.

BOOKS RECOMMENDED

1. The Startup Owner's Manual: The Step-by-Step Guide for Building a Great Company – Steve Blank and Bob Dorf, K & S Ranch, ISBN: 978-0984999392
2. Entrepreneurship Development (A New Venture Creation) – Vasant Desai, Himalaya Publishing House
3. Entrepreneurship Development – Khanka S.S., S. Chand & Company Ltd., New Delhi
4. Entrepreneurship Development – Gupta and Srinivasan, S. Chand & Company Ltd., New Delhi
5. Demand: Creating What People Love Before They Know They Want It – Adrian J. Slywotzky with Karl Weber, Headline Book Publishing, ISBN: 978-0755388974
6. The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses – Eric Ries, Penguin UK, ISBN: 978-0670921607
7. The Innovator's Dilemma: The Revolutionary Book That Will Change the Way You Do Business – Clayton M. Christensen, Harvard Business Review Press, ISBN: 978-1422196021

SUGGESTED SOFTWARE/LEARNING WEBSITES:

1. https://www.fundable.com/learn/resources/guides/startup
2. https://corporatefinanceinstitute.com/resources/knowledge/finance/corporate-structure/
3. https://www.finder.com/small-business-finance-tips
4. https://www.profitbooks.net/funding-options-to-raise-startup-capital-for-your-business/
5. NPTEL Course on Entrepreneurship https://onlinecourses.nptel.ac.in/noc23_mg74/preview
6. National Geographic Channel you tube Video on "GI Tag Crafts of Bharat"

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SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (periods)	Marks Allotted (%)
1	05	17
2	04	14
3	08	20
4	06	17
5	03	21
6	02	11
Total	**28**	**100**

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PROJECT	6.3 PROJECT WORK	L	T	P
		4	-	16

COURSE OBJECTIVE

The Project course aims to provide students with hands-on experience in identifying, planning, and executing a textile or fashion-related design or research project. It enables students to apply theoretical knowledge to real-world problems by developing design concepts, planning processes, selecting materials and techniques, and implementing solutions. The course emphasizes systematic data collection, analysis, iterative design development, problem-solving, and practical execution using laboratory, workshop, or industry facilities. Students also learn to document their work professionally and communicate results effectively through a comprehensive project report and presentation, preparing them for industry-ready professional practice or higher studies.

COURSE OUTCOMES(CO):

The theory should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following COURSE OUTCOMES.

Students will be able to

CO1 Identify and define a project problem, formulate objectives, and plan a systematic approach for its execution..

CO2 Collect, analyze, and organize data, references, and materials to support project design or process development.

CO3 Execute the project by applying appropriate techniques, tools, and processes while recording observations and making improvements..

CO4 Prepare a comprehensive project report and effectively present the work, including methodology, results, discussion, and conclusions.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	3	3	3	3	3	2	*	*
CO2	3	3	3	2	1	3	2	*	*
CO3	3	3	3	3	1	3	2	*	*
CO4	3	2	3	3	2	3	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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PROJECT CONTENTS / GUIDELINES

UNIT–1 : PROJECT IDENTIFICATION AND PLANNING (14 Periods)

- Selection of project topic
- Identification of problem / design brief
- Objectives and scope of the project
- Literature survey / background study
- Preparation of project proposal
- Approval of project topic by department

UNIT–2 : DATA COLLECTION AND DESIGN / PROCESS DEVELOPMENT (14 Periods)

- Collection of data, samples or design references
- Study of existing methods or designs
- Selection of materials, tools and techniques
- Design development / process planning
- Preparation of drawings, layouts or flow charts
- Interim evaluation and progress review

UNIT–3 : IMPLEMENTATION AND EXECUTION (14 Periods)

- Execution of design / process / experiment
- Use of laboratory, workshop or industrial facilities
- Observation and recording of results
- Modifications and improvements based on results
- Problem-solving during execution stage

UNIT–4 : PROJECT REPORT PREPARATION AND PRESENTATION (14 Periods)

- Preparation of project report including:
- Introduction
- Objectives
- Methodology
- Results and discussion
- Conclusion
- Use of diagrams, photographs and charts
- Presentation of project work

Viva-voce examination

A viva voce examination shall be conducted at the end of the project for assessing the work of the student. The examination committee for this purpose shall consist of a professional designer, teacher who has guided the project. The project work should be properly displayed by the student.

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SUGGESTED PROBLEMS FOR PROJECT WORK : (54 Periods)

The theme will be discussed in the theory period. For each submission the students are required to submit :

(a) 20 Ideas (croquis)
(b) Final design with repeat.
(c) 5 colourways
(d) Design printed on fabric.

All work will have to be executed in the theory class, studio and laboratory under the supervision of a lecturer, Studio Assistant or Laboratory Assistant.

1. Theme : Floral pattern in stylised and naturalistic form. For : Saree for summer wear.
   Fabric : Saffron
   Method : Hand painted
   Dye : Acrymen
   Placement : Of your choice
   Colour scheme : No limit Practical
   Submission : On 5.5 meter fabric.

   Special feature : Placement and colour scheme, as in this method you can have light and dark shades, the play of the fine artwork with brush. Each report to have the characteristic of the flow of the hand as you are not allowed to trace the design of the fabric. Each report to be in origional form.

2. Theme : Indian mythology depicting a Mahabharat or Ramayana scene. The design you could use the salient feature of mythology e.g. the chariot wheels. The armour used for warriors or the decorative form of architecture arches etc.
   For : bed cover / floor covering.
   Method : Screen printing lacquer method.
   Fabric : Of your choice.
   Placement : Of your choice.
   Dyes : Acramyn.
   Repeat : Based on the theme.
   Colour scheme : Minimum five colours.
   Practical Submission: Double Bed Covers/Floor covering.
   Special feature : The choice of the fabric, and to create a harmony in the theme for all the objects as they will placed in one room the ingenuity lies in your design to use minimum screens from small layout to large layout.

3. Theme : Batik and block printing technique in geometrical or abstract design.
   For : Set of dinning room consisting of
   1. Table cloth and napkins or table mats and napkins.
   2. Oil painting in the theme of still life of ceramics and fruits.
   Fabric : Khadi/cotton
   Placement : Your choice based on the need.
   Method : The above three techniques.
   Dyes : Pigment
   Repeat : Based on the placement and theme.
   Colour scheme : Minimum three colours including the back ground.
   Practical submission: Standard sizes of the requirement.
   Special feature : The application of the technique its limitations and its scops for

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effects.

4. Theme : Paisley motifs with decorative form of floral pattern increased with black out line work.
   For : Silk screen.
   Method : Block printing on dyed fabric for discharge colourings.
   Placement : Border on four sides with centre motif.
   Dyes : Direct dyes for dyeing the cloth and discharge dyes for printing the block designs. Size of the fabric for practical submission 36"X 36".
   Repeat : Based on the placement and formation of the blocks implied. Colour scheme
   : Black outline. Coloured background and two colours of the pattern.
   Special feature : The discharge technique, as this technique replaces the original colours and white on coloured back-ground, the intermingling of colour effect.
5. Theme : Sea Animals (Fishes), sea weeds and sea shells.

   For : Bath room set.
   Bath towel, bath mat, Hand towel, guest towel. Bath room curtains.
   Fabric : Ready made set or toweling material for the towel set and cambric for the curtain.
   Method : Lacquer screen printing.
   Placement : Your choice.
   Dyes : Acramyn
   Repeat : Of your choice.
   Colour scheme : On white back ground three stages one colour shades . Practical submission: Standard sizes towels.
   Special feature : The placement of designs and the colour effect.

6. Theme : Floral pattern, flower heads buds, leaves and stem in intricate fine line work.
   For : Cambric.
   Method : Photographic screen printing.
   Dyes : Fancy dyes.
   Colour scheme : Two colour only.
   Placement : All cover.
   Repeat : 30 cm X 90 cm
   practical Submission: On 3(three) meter piece.
   Special feature : Photographic screen printing which has a good effect of the line work.

7. Theme : Floral pattern
   For : Sari.
   Fabric : Nylon or organdie.
   Method : Nozzle printing.
   Dyes : Enamel paint.
   Colour scheme : One colour only.
   Placement : All over.
   Repeat : Your choice.
   Submission of practical: A complete sari.
   Special feature : The free hand moving.

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8. Theme : Floral pattern
For : Dress.
Fabric : Cotton.
Method : Spray painting with the stencil technique.
Colour scheme : One colour only.
Repeat : Your choice.
Dyes : Mordant dyes.
Placement : Half drop.
Submission : 3 meter fabric.
Special feature : Subdued effect of the stencil and spraying effect of the dyes.

Design for Roller printing and photographic screens on paper only.

A. Theme : Stylised floral pattern.
For : Sarees
Fabric : Synthetic material.
Method : Photographic screen printing.
Placement : All over.
Dyes : Pigments.
Repeat : 40 cm. X 120 cm.
Colour Scheme : Four colours on white back ground.

B. Theme : Trees in perspective.
For : Curtains.
Fabric : Cotton satin.
Method : Roller printing.
Placement : In horizontal stripes.
Dyes : Acramin.
Repeat : 24 inch X 48 inch
Colour scheme : Trees colours during Autumn

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THEORY	6.4 ARTIFICIAL INTELLIGENCE (OE-3)	L	T	P
		2	-	-

COURSE OBJECTIVES
The objectives of this course are to:

- Introduce students to the fundamental concepts, goals, and applications of Artificial Intelligence.
- Enable understanding of intelligent agents and their interaction with different environments.
- Develop basic knowledge of search algorithms and problem-solving techniques used in AI.
- Familiarize students with fuzzy logic systems and their role in decision-making.
- Introduce neural network concepts and their applications in intelligent systems.

COURSE OUTCOMES (CO):
After successful completion of this course, the students will be able to:

CO1: Explain the concept, goals, history, and applications of Artificial Intelligence.
CO2: Describe intelligent agents, their types, and properties of environments.
CO3: Apply basic search algorithms and heuristic techniques for problem solving.
CO4: Explain principles and components of fuzzy logic systems.
CO5: Describe the structure and working of neural networks including perceptron and back-propagation.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

Course Out-comes (COs)	PO1 Basics & Discipline Knowledge	PO2 Problem Analy-sis	PO3 Design & Development	PO4 Tools, Exper-imentation & Testing	PO5 Socio-Economic/ Environ-mental	PO6 Project Mgmt & Communi-cation	PO7 Lifelong Learn-ing	PSO 1	PSO 2
CO1	3	1	–	–	–	–	1	*	*
CO2	2	2	–	–	–	–	1	*	*
CO3	2	3	–	–	–	–	1	*	*
CO4	2	2	–	–	–	–	1	*	*
CO5	2	2	1	–	–	–	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)
* PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

COURSE CONTENT:

Unit 1 – Introduction to Artificial Intelligence (06 Periods)
• Artificial Intelligence (AI) definition
• Goals of AI
• History of AI
• Applications of AI

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Unit 2 – Agents and Environments (06 Periods)
• Agent Terminology, Types of Agents – Simple Reflex Agents, Model Based Reflex Agents, Goal Based Agents
• Nature of Environments, Properties of Environments

Unit 3 – Search Algorithms Terminology (06 Periods)
• Brute Force Search Strategies – Breadth First Search, Depth First Search.
• Heuristic Search Strategies, Local Search Algorithms.

Unit 4 – Fuzzy Logic Systems (05 Periods)
Introduction to Fuzzy Logic and Fuzzy systems,
• Membership functions,
• Fuzzification/Defuzzification

Unit 5 – Neural Networks (05 Periods)
Basic structure of Neural Networks
• Perceptron
• Back-propagation

RECOMMENDED BOOKS

Artificial Intelligence By Example: Develop machine intelligence from scratch using real artificial Intelligence use cases Denis Rothman Packt Publishing ISBN – 978-1788990547

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (periods)	Marks Allotted (%)
1	06	15
2	06	25
3	06	20
4	05	20
5	05	20
Total	**28**	**100**

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THEORY	6.4 DISASTER MANAGEMENT (OE-3)	L	T	P
		2	-	-

COURSE OBJECTIVES:

Following are the objectives of this course:

- To learn about various types of natural and man-made disasters.
- To know pre- and post-disaster management for some of the disasters.
- To know about various information and organisations in disaster management in India.
- To get exposed to technological tools and their role in disaster management.

COURSE OUTCOMES:

After competing this course, student will be:

CO1: Acquainted with fundamental concepts of disaster, hazard, vulnerability, risk, and capacity, and explain their inter-relationships.

CO2 : Classify various types of disasters (Geological, Hydro-meteorological, Biological, Man-made) and analyze their causes, trends, and consequences.

CO3 : Apply the Disaster Management Cycle (Pre, During, Post) and global frameworks (Hyogo, IDNDR) to plan for risk assessment and mitigation.

CO4 : Familiarised with institutional and legal mechanism of Disaster Management in India, including the DM Act 2005 and the role of various agencies.

CO5: Able to select scientific tools (GIS, RS, GPS) and engineering practices (structural/non-structural mitigation) for disaster preparedness and safe construction.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Engineering Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PS O 1	PSO 2
CO1	2	-	-	-	3	-	1	*	*
CO2	3	2	-	-	3	-	2	*	*
CO3	1	2	1	-	3	2	2	*	*
CO4	2	-	-	-	3	1	2	*	*
CO5	3	2	1	2	3	2	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

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COURSE CONTENTS

UNIT – I: UNDERSTANDING DISASTER (04 Periods)

Understanding the Concepts and definitions of Disaster, Hazard, Vulnerability, Risk, Capacity – Disaster and Development, and disaster management.

UNIT–II: TYPES, TRENDS, CAUSES, CONSEQUENCES AND CONTROL OF DISASTERS (05 Periods)

Geological Disasters (earthquakes, landslides, tsunami, mining); Hydro-Meteorological Disasters (floods, cyclones, lightning, thunder-storms, hail storms, avalanches, droughts, cold and heat waves) Biological Disasters (epidemics, pest attacks, forest fire); Technological Disasters (chemical, industrial, radiological, nuclear) and Manmade Disasters (building collapse, rural and urban fire, road and rail accidents, nuclear, radiological, chemicals and biological disasters) Global Disaster Trends – Emerging Risks of Disasters – Climate Change and Urban Disasters.

UNIT - III: DISASTER MANAGEMENT CYCLE AND FRAMEWORK (06 Periods)

Disaster Management Cycle – Paradigm Shift in Disaster Management. Pre-Disaster – Risk Assessment and Analysis, Risk Mapping, zonation and Micro zonation, Prevention and Mitigation of Disasters, Early Warning System; Preparedness, Capacity Development; Awareness. During Disaster – Evacuation – Disaster Communication – Search and Rescue – Emergency Operation Centre – Incident Command System – Relief and Rehabilitation – Post-disaster – Damage and Needs Assessment, Restoration of Critical Infrastructure – Early Recovery – Reconstruction and Redevelopment; IDNDR, Yokohama Strategy, Hyogo Framework of Action.

UNIT – IV: DISASTER MANAGEMENT IN INDIA (05 Periods)

Disaster Profile of India – Mega Disasters of India and Lessons Learnt. Disaster Management Act 2005 – Institutional and Financial Mechanism, National Policy on Disaster Management, National Guidelines and Plans on Disaster Management; Role of Government (local, state and national), Non-Government and Inter Governmental Agencies 457 Open Elective Courses

Unit–V: APPLICATIONS OF SCIENCE AND TECHNOLOGY FOR DISASTER MANAGEMENT (08 Periods)

Geo-informatics in Disaster Management (RS, GIS, GPS and RS). Disaster Communication System (Early Warning and Its Dissemination). Land Use Planning and Development Regulations, Disaster Safe Designs and Constructions, Structural and Non-Structural Mitigation of Disasters S&T Institutions for Disaster Management in India

RECOMMENDED BOOKS:

1. Publications of National Disaster Management Authority (NDMA) on Various Templates and Guidelines for Disaster Management.
2. Bhandani, R. K., An overview on natural & man-made disasters and their reduction, CSIR, New Delhi.
3. Srivastava, H. N., and Gupta G. D., Management of Natural Disasters in developing countries, Daya Publishers, Delhi.
4. Alexander, David, Natural Disasters, Kluwer Academic London.
5. Ghosh, G. K., Disaster Management, A P H Publishing Corporation.
6. Murthy, D. B. N., Disaster Management: Text & Case Studies, Deep & Deep Pvt. Ltd.

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SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (periods)	Marks Allotted (%)
I	02	10
II	05	19
III	08	28
IV	05	19
V	08	24
Total	**28**	**100**

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GUIDELINES FOR ASSESSMENT OF STUDENT-CENTRED ACTIVITIES (SCA)

It was discussed and decided that the maximum marks for SCA should be 50 as it involves a lot of subjectivity in the evaluation. The marks may be distributed as follows:

i. 15 Marks for general behaviour and discipline
(by HODs in consultation with all the teachers of the department)

ii. 10 Marks for attendance as per following:
(by HODs in consultation with all the teachers of the department)

a)	75 - 80%	6 Marks
b)	80 - 85%	8 Marks
c)	Above 85%	10 Marks

iii. * Even Semester:

25 Marks maximum for Sports/NCC/Cultural/Co-curricular/NSSactivities as per following: (by In-charge Sports/NCC/Cultural/Co-curricular/NSS)

a) State/National Level participation
b) Participation in two of above activities
c) Inter-Polytechnic level participation

****Odd Semester:**

25 Marks maximum

a) Language Lab Practices / foreign language practices
b) Group Discussion and Personality Development
c) Industrial Visits/Industrial Talks
d) Power Point Presentations and Resume Making
e) Development of Aptitude and Reasoning Skills
f) Participation in the technical Exhibitions, Symposiums, Seminars, Workshops at the Institute /District/State/National Level.

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8. RESOURCE REQUIREMENT

A. PHYSICAL RESOURCES

a. Space requirement

Norms and standards laid down by All India Council for Technical Education (AICTE) are to be followed to work out space requirement in respect of classrooms, tutorial rooms, drawing halls, laboratories, space required for faculty, student amenities and residential area for staff and students.

b. Equipment Requirement:

Following Laboratories are required:

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Textile Design(Printing) Curriculum													
Practical Subjects and Laboratory Mapping													
Sem	Code	Subject	Laboratory Name	Design Studio		Dyeing and Printing Lab		Weaving Lab		CATD Lab		Textile Testing Lab	
				ODD	EVEN	ODD	EVEN	ODD	EVEN	ODD	EVEN	ODD	EVEN
1	1.2	PRINCIPLES OF DESIGN & SKETCHING (PRACTICAL)	Design Studio	**6**									
2	1.5	TEXTILE MATERIALS (PRACTICAL)	Textile Testing Lab									**6**	
3	2.2	TEXTILE COLORATION	Dyeing and Printing Lab				**6**						
4	2.3	INDIAN TRADITIONAL DESIGN	Design Studio		**6**								
5	2.5	DRAWING, RENDERING & STUDY OF OBJECTS	Design Studio		**6**								
6	3.2	TEXTILE PRINTING & FINISHING	Dyeing and Printing Lab			**6**							
7	3.4	FABRIC STRUCTURE	Weaving Lab					**6**					
8	3.5	COMPUTER AIDED TEXTILE DESGIN-I	CATD Lab							**6**			
9	4.3	TEXTILE DESIGN –I (Lab)	Design Studio, Weaving Lab		**2**				**2**				
10	4.4	COMPUTER AIDED TEXTILE DESGIN-II	CATD Lab								**4**		
11	5.2	TEXTILE TESTING & QUALITY CONTROL (Lab)	Textile Testing Lab									**6**	
12	5.4	TEXTILE DESIGN –II (Lab)	Design Studio, Weaving Lab	**3**				**3**					
			Total weekly load	**9**	**14**	**6**	**6**	**9**	**2**	**6**	**4**	**12**	**0**

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Dyeing and Printing Lab				
S. No.	**Item**	**Specification**	**Quantity**	**Estimated cost per unit**
1	Physical Balance	(Electronic)	4	15,000=00
2	WATER BATH :	Plastic /Aluminium	15	500=00
3	Dye post	porcelain ; Stainless steel	60	500=00
4	Glass rods per Kg.			100=00
5	Winchester Bottle	(5 liters)	5	500=00
6	Buckets	Plastic 20L	5	250=00
7	Mugs	Plastic 500ml	10	50=00
8	Measuring Cylinders	250ml, 500ml,1000ml	30	1000=00
9	Test tube with holder	20ml	30	100=00
10	Beaker	250ml,500ml	30	1000=00
11	Printing Table	(5' X 20'x2.5') Wooden	1	25,000=00
12	Exposing Table	(3' X 5'X2.5') with glass screen and lighting arrangements	1	20,000=00
13	Screens of Various sizes		10	400=00
14	Electrically heated steam ager	1kw	1	50,000=00
15	No.of blocks of various De-sign	various size	100	150=00
16	Bhagona (Utensil)	5L, 10L and 20L	2	2500=00
17	(a) Jigger Dyeing Machine	Working width 450mm to 600mm Temperature up 98degree Celsius, Speed 6 MPM, Volume of dye liquor 1.80 liter, Heating load 1.5kw and SS-316	1	250000=00
	(b) Padding Mangle	Working width 450mm to 600mm Working pressure 4kg/cmsq max Speed 3 MPM Bowl Hardness 70 shore	1	
	(c) Winch Dyeing Machine	MLR 1:20 Dimension 650mm/500mm/600mm appro net wet 55kg and 80kg	1	180,000=00
	(d) Model of Roller Printing M/c		1	14,00,000=00
18	THERMOMETERS			
	(a) 0-100 C		20	500=00
	(b) 100-200 C		20	500=00
19	Ironing Station with steam iron	Industrial	1	16000=00

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Weaving Lab				
S. No.	**Item**	**Specification**	**Quantity**	**Estimated cost per unit**
1	Table top looms 8 shafts	Manually operated 8 shaft table top looms, small weaving width with necessary accesories like reeds, healds, 4 shuttles, pirns Reed space 24", etc.	5	60000
2	Table top looms 4 shafts	Manually operated 4 shaft table top looms, small weaving width with necessary accesories like reeds, healds, 4 shuttles, pirns, Reed space 24", etc.	5	58000
3	Table top looms 2 shafts	Manually operated 2 shaft table top looms, small weaving width with necessary accesories like reeds, healds, 4 shuttles, pirns Reed space 24", etc.	5	55000
4	Pirn winding machine (manual)	Manually operated pirn winding machine with accesories	5	5000
5	Dobby Loom	Dobby loom with 36 Shaft capacity - 15-24 inch weaving width. with acessories - reeds, healds, shuttle, pirns, pattern chain lattice, pegs and others as needed	1	2,00,000
6	Jacquard loom	Manual Jacquard loom with 100 hooks Installed at ,handloom small size 48", reed, beam, Fabric Rolls , Extra pirn, extra shuttle and all the necessary items required to run the loom.	1	2,00,000
7	Fully automatic electronic Jacquard	Fully automatic electronic jacquard 200 hooks, installed at rapier loom with reed space with 48", Warp beam, fabric beam should be given in running conditon.	1	30,00,000
8	Warping machine	Sampling size manual warping machine, it should be prepare warp beam of upto 48" reed space loom.	1	1,00,000
9	Card punching machine	Computerised card punching machine	1	2,00,000

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CATD Lab				
S. No.	**Item**	**Specification**	**Quantity**	**Estimated cost per unit**
1	Desktop Computers with latest configuration	Desktop Computers i5 or i7 with latest configuration. with higher RAM, Graphics card suitable for designing work and wifi	30	70,000
2	Laptop Computer	Laptop Computer with latest configuration with higher RAM and Graphics card suitable for designing work	1	70,000
3	Graphics tablet with pen	10 inches	30	12,000
4	Wifi Router	Sufficient for connecting upto 50 devices	1	10,000
5	Plotter B/W	36 Inch wide printing capacity	1	80,000
6	Flat bed Scanner	A3 Size Scanner	1	35,000
7	Colour Printer	A3 Inkjet Printer, photo quality	1	35,000
8	B/W Laser Printer	A4 double sided high speed printer	1	25,000
9	Online UPS	5 KVA on line UPS with minimum 30 minute battery backup along with maintenance free batteries.	2	2,50,000
10	Inverter	2KVA inverter with double 12 Volt batteries	2	50,000
11	Computer Tables	Computer tables	30	8,000
12	Computer Chairs	Revolving, arm chairs with wheels	30	6,000
13	Air conditioners	Split air Conditioners 1.5 ton	4	60,000
14	Vaccum Cleaner	Vaccum cleaner dry and wet	1	20,000
15	Interactive smart board	75 inch interactive touch smart board	1	3,50,000
16	CATD Software	Computer Aided textile design software multi user - Dobby, Jacquard and Print Designs with draping facility	1	8,00,000
17	Vector Graphics Software	Inkscape (Open source) or Corel Draw Adobe Illustrator or similar	30	Free (Open Source) or as Propreiter's prevailing rates
18	Image Editor Software	GIMP (Open Source) or Adobe Photoshop or similar	30	Free (Open Source) or as Propreiter's prevailing rates
19	Pendrives	Higher 128 GB or higher	15	1,500
20	External SSD	1 TB or Higher	1	5,000

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Textile Testing Lab				
S. No.	**Item**	**Specification**	**Quantity**	**Estimated cost per unit**
1	Dry & wet bulb Hydrometer	Mercury Filled Hygrometer -5 to 50 deg C with equivalent deg F, with wet and dry bulb tables for determining humidity levels,Temperature Range : -8°C to +50°C (20°F to 120°F), with all complete accessories	1	3000=00
2	Wrap reel Electronic	To produce skeins of yarn of a predetermined length and number of turns for count and/or strength testing. 1 meter, 1 yard, or 54" circumference collapsible swift (specify), Complete with yarn package stand and pretension device, fitted with predetermined counter, electronic, with all complete accessories	1	60000=00
3	Electronic balance	weighing capacity-5 kg, accuraxy - 0.01 gm, with all complete accessories	4	35000=00
4	Beesley Yarn balance	Precision Jewel Bearing, Black acrylic template to prepare sample with all accessories-Acrylic Template, Two Riders & pointing Needle, with all complete accessories	4	30000=00
5	Twist Tester	test length - 25 to 250 mm, load on test specimen-0 to 100 gm, five digit revolution counter, with all complete accessories	2	30000=00
6	Lea strength tester	Single Phase 220 Volt AC,Capacity: 1000 kgf, with all complete accessories	1	80000=00
7	Drape Meter	Accuracy +- upto 1.50, Imaging sensor CCD, Rotation speed 10 to 120 RPM, Drape Coefficient Ratio 0 to 100%, Dimensions of specimen-240mm to 360mm	1	60000=00
8	Abrasion Resistance Tester	Spcimens at a time - 4, with all complete accessories	1	150000=00
9	Textile Tensile Strength testing Machine	Capacity of Tester: 500kgf, Traverse Speed: Fixed 100 & 300mm/min, Min. Grip Separation: 25 mm,Motor: 0.5 HP Single phase 220V 50 Hz.	1	130000=00
10	Fabric Stiffness tester	Material: Mild Steel, with all complete accessories	1	30000=00
11	Fabric crimp tester	with all complete accessories	1	50000=00
12	Crease recovery tester	with all complete accessories	2	30000 = 00
13	Crock Meter with Grey Scale	Stainless steel, with all complete accessories	1	40000=00
14	Tearing Strength Tester	Checking Weight: 1600g, 3200g, 6400g, with all complete accessories	1	60000=00
15	GSM round cutter	Automation Grade: Manual, ample Cut: 100 cm2, with all complete accessories	1	20000=00

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16	Fabric Thickness Tester	Thickness Measurement, with all complete accesso-ries	3	20000=00
17	Quadrant Balance	with all complete accessories	1	20000=00

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Design Studio Lab				
S. No.	**Item**	**Specification**	**Quantity**	**Estimated cost per unit**
1	Large worktables for layout and cutting	10 x 4 x 2 Feet	4	₹15,000
2	Projector with screen	Ceiling Mounted, HDMI, Latest configuration	1	₹60,000
3	Interactive smart board	75 inch interactive touch smart board	1	₹4,50,000
4	Tracing Box	2 x 3 Feet	1	₹30,000
5	Drawing tables with (tilting /flat boards)		30	₹15,000
6	Mood board/ Display boards	4 x 2 Feet	2	₹5,000
7	Ergonomic chairs	Revolving, Height Adjustable, without arm, low back	30	₹4000
8	Almirah Storage units for art materials	Full Size	4	₹20000
9	Storage Racks	Open rack, Steel	8	₹10000
10	Cutting tools	Cutting mats, paper scalpels, scissors, rotary cutters,paper Knives etc	Misc	₹10000
11	Still-life stand	2.5-3ft	4	₹3,000
12	Computer System/Laptop	Latest Configuration	1	₹120000
13	Digitizer/ Tablet and Pen	Latest Configuration	4	₹35,000
14	Stationery	Various Color Mediums / PencilsDifferent Types,Rulers,erasers ,tracing sheets	Misc	₹10,000
15	Drawing Tools	T square,set square, Brushes, Compass, Liners etc.	Misc	₹10,000

B. Furniture Requirement

Norms and standards laid down by AICTE -APH (latest) be followed for working out furniture requirement for diploma courses

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C. Human Resources:

Weekly work schedule, annual work schedule, student teacher ratio for various group and class size, staffing pattern, workload norms, qualifications, experience and job description of teaching staff workshop staff and other administrative and supporting staff be worked out as per norms and standards laid down by the AICTE.

9. EVALUATION SCHEME GUIDELINES: As Per AICTE ATTACHED (ANNEXURE- 2)

a. Theory Courses:

- Internal Assessment: 40%
- End Semester Examination: 60%
- Passing Criteria: A student must secure a minimum of 40% marks separately in both internal assessment and end semester examination to pass the course.

b. Practical Courses:

- Internal Assessment: 60%
- End Semester Examination: 40%
- Passing Criteria: A student must secure a minimum of 40% marks separately in both internal assessment and end semester examination to pass the course.

c. Summer Internship / Projects / Seminars, etc.:

- Evaluation is based on the following components:
  - Quality of work completed
  - Report preparation and documentation
  - Viva-voce performance
  - Presentation skills

Note:
Internal assessment is conducted based on the student's overall performance, which includes:

- Two best out of three mid-semester tests
- Quizzes and assignments
- Class participation and attendance
- Viva-voce and lab records (for practical subjects)

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ANNEXURE- 2

1. EVALUATION METHOD for THEORY

	Internal Assessment (40 marks)				External Assessment (60 marks)
	IA 1	**IA 2**	**IA 3**	**IA 4**	
Mode	**Written Test**	**Written Test**	**Attendance and Assignments**	**Pre – Semester Examination**	**End Semester Examination**
Portion	2 units	2 units	Regularly	All units	All units
Duration1hr	1hr	1hr	-	3hrs	3hrs
Exam Marks	20	20	20	60	60
Converted to	10	10	15	15	60
Tentative Schedule	5^{th} Week	10^{th} Week	Regularly	12^{th} -13^{th} Week	

IA1 and IA2: A written assessment test worth 20 marks should be conducted for two units. The marks earned (20 marks) will be converted to 10 marks. The best of the two assessments will be evaluated for an internal 10-mark assessment.

IA3: Assignments given after the completion of each unit, along with attendance throughout the semester, will be assessed for a total of 15 marks.

IA4: The pre-semester examination should follow the end-semester examination question pattern. The marks should be adjusted to 15 for internal assessment.

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2. EVALUATION METHOD for PRACTICAL

	Internal Assessment (60 marks)				External Assessment (40 marks)
	IA 1	**IA 2**	**IA 3**	**IA 4**	
Mode	**Practical Test**	**Practical Test**	**Attendance and Practical Documentation**	**Practical Test and Quiz – Viva Voce**	**Practical Examination**
Portion	50% Practical	50% practical	All practical	All practical	All practical
Duration	3hrs	3 hrs	Regularly	3 hrs	3hrs
Exam Marks	20	20	20	20	40
Tentative Schedule	5th Week	10th Week	Regularly	12th -13th Week	

IA1 and IA2: Complete all exercises and experiments as outlined and retain them for the practical test. The test should be conducted in accordance with the evaluation scheme. The best of the two practical tests will be internally evaluated for a total of 20 marks.

IA3: Maintain a practical file for each exercise while ensuring attendance throughout the semester. Submit the required documents for the practical file, quiz, and practical test along with a valid certificate (Progress Card). This will be assessed for 20 marks.

IA4: The pre-semester practical examination, quiz, and viva-voce should follow the end-semester practical examination pattern, with marks adjusted to 20 for internal assessment.

SUGGESTED DISTRIBUTION OF MARKS FOR **INTERNAL** EVALUATION

Part	Description	Marks Allotted
A.	Objective	**5**
B.	Circuit Diagram	**5**
C.	Procedure and Connections	**10**
D.	Observation Table and Calculation	**10**
E.	Result and its Discussion, Conclusion	**10**
F.	Practical Test	**20**
	Total	**60**

SUGGESTED DISTRIBUTION OF MARKS FOR **EXTERNAL** EVALUATION

Part	Description	Marks Allotted
A.	Objective	**5**
B.	Circuit Diagram	**5**
C.	Procedure and Connections	**5**
D.	Observation Table and Calculation	**5**
E.	Result and its Discussion, Conclusion	**10**
F.	Viva-Voce	**10**
	Total	**40**

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3. EVALUATION METHOD for PRACTICUM (End Exam-Practical)

	Internal Assessment (60 marks)				External Assessment (40 marks)
	IA 1	**IA 2**	**IA 3**	**IA 4**	
Mode	**Practical Test**	**Practical Test**	**Attendance and Practical Documentation**	**Micro Project**	**Practical Examination**
Portion	50% practical	50% practical	All practical	All practical	All practical
Duration	3hrs	3 hrs	Regularly	Regularly	3hrs
Exam Marks	20	20	20	20	40
Tentative Schedule	5th Week	10th Week	Regularly	12th -13th Week	

- **IA1 and IA2:** Complete all exercises and experiments as instructed and retain them for the practical test. The test should be conducted according to the evaluation scheme. The best of the two practical tests will be internally assessed for a total of 20 marks.
- **IA3:** Maintain a practical file for each exercise, ensuring attendance throughout the semester. Submit the required documents for the practical file, quiz, practical test, and end-semester examination, along with a valid certificate (Progress Card). This will be evaluated by 20 marks.
- **IA4:** Submit a micro-project report along with a fabrication model or analysis report. The performance of each student in the group will be assessed by both the laboratory supervisor and an internal examiner. This evaluation will contribute 20 marks.

SUGGESTED DISTRIBUTION OF MARKS FOR **INTERNAL** EVALUATION

Part	Description	Marks Allotted
A.	Objective	**5**
B.	Circuit Diagram	**5**
C.	Procedure and Connections	**10**
D.	Observation Table and Calculation	**10**
E.	Result and its Discussion, Conclusion	**10**
F.	Mini Project	**20**
	Total	**60**

SUGGESTED DISTRIBUTION OF MARKS FOR **EXTERNAL** EVALUATION

Part	Description	Marks Allotted
A.	Objective	**5**
B.	Circuit Diagram	**5**
C.	Procedure and Connections	**5**
D.	Observation Table and Calculation	**5**
E.	Result and its Discussion, Conclusion	**10**
F.	Viva-Voce	**10**
	Total	**40**

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4. EVALUATION METHOD for PRACTICUM (End Exam-Theory)

	Internal Assessment (40 marks)						External Assessment (60marks)
	IA 1		IA 2		IA 3	IA 4	
Mode	**Written Test**	**Practical Test**	**Written Test**	**Practical Test**	**Attendance and Practical Documentation**	**Pre Semester Examination and Micro Project**	**End Semester Examination**
Portion	2 units	Practical related to the units	2 units	Practical related to the units	All unit	All Practical	All unit
Duration	1hr	3hrs	1hr	3 hrs	3hrs	Regularly	3hrs
Exam Marks	10	20	10	20	60	60	60
	30		30				
Converted to	10		10		15	15	60
Tentative Schedule	5th Week		10th Week		Regularly	12th -13th Week	

IA1 and IA2: A written assessment test worth 10 marks should be conducted for two **UNIT**s. Complete all exercises and experiments as outlined and retain them for the practical test worth 20 marks. The practical test should be conducted in accordance with the evaluation scheme. The total marks earned (30 marks) will be converted to 10 marks. The best of the two assessments will be internally evaluated for a total of 10 marks.

IA3: Attendance and the pre-semester examination should follow the end-semester examination question paper pattern. The marks should be adjusted to 15 for internal assessment.

IA4: Maintain a practical file for each exercise. Submit the required documents for the practical file, quiz/viva-voice, practical test, and end-semester examination, along with a valid certificate (Progress Card). This will be assessed for 40 marks. Additionally, submit a micro-project report along with a fabrication model or analysis report. The performance of each student in the group will be evaluated by both the laboratory supervisor and an internal examiner. The total of 60 marks will be converted to 15 marks.

SUGGESTED DISTRIBUTION OF MARKS FOR **INTERNAL** EVALUATION FOR IA4

Part	Description	Marks Allotted
A.	Objective	**5**
B.	Circuit Diagram	**5**
C.	Procedure and Connections	**5**
D.	Observation Table and Calculation	**5**
E.	Result and its Discussion, Conclusion	**10**
F.	Attendance & Mini Project	**10**
	Total	**40**

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10. LIST OF EXPERTS

1. Shri Pankaj Yadav, HOD Textile Design, GP Jigirsand, Sikandarpur, Ballia.
2. Shri. Umesh Chandra Sonkar, Lecturer, GGP Varanasi.
3. Shri Pawan Kumar Chaurasia, Lecturer, Textile Design ,GP Jigirsand, Sikandarpur, Ballia.
4. Shri Himanshu Mauriya, Lecturer, Textile Design, GGP Prayagraj.
5. Smt. Goldi Jaiswal, Lecturer, Textile Design, GGP Prayagraj.
6. Shri. Prabhakar Singh, Lecturer, Textile Design, GGP Gorakhpur.
7. Smt. Jyoti Singh, Lecturer, Textile Design, GGP Gorakhpur.
8. Shri Vishesh Kumar, Lecturer, Textile Tech. Baheri, Barilley.
9. Ankit Agarwal, Demand Planner, Herschel Supply Company, Vancouver, Canada.

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(ANNEXURE-I)

PROCEDURES / FORMATS FOR ORGANIZING INTERNSHIPS.

STUDENT INTERNSHIP PROGRAM APPLICATION

Complete and submit to the TPO/ Internship Program Coordinator.

1. Student Name:		Enroll. No.:	
2. Campus Address:		Phone:	
3. Home Address:		Phone:	
4. Student email address:			
5. Branch:		6. Internship Semester: _____	
7. Internship Preferences			
	Company/Industry	Core Area	Location
Preferance-1			
Preferance-2			
Preferance-3			
Faculty mentor Signature: _____Date_____.			
Student Signature: _____Date_____. Signature confirms that the student agrees to the terms, conditions, and requirements of the Internship Program			

Signature with seal
HOD/Principal

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(ANNEXURE-I)

REQUEST LETTER FROM INSTITUTE TO INTERNSHIP/INDUSTRIAL TRAINING PROVIDER

Ref. No.: _____ Date: _____

To,
The HR Manager/Training Coordinator
……
……

Subject: Request for Internship/Industrial Training for Diploma Students

Sir/Madam,

We are pleased to introduce……., a premier institution affiliated with Board of Technical Education, Uttar Pradesh, offering diploma programs in various diploma disciplines.

As a part of the curriculum, our students are required to undergo Internship/Industrial Training to gain practical exposure and enhance their technical competencies. Therefore, we kindly request your esteemed organization to provide Internship/Training opportunities to our students during the period from …….. to ……..

S. No.	Name	Enroll. No.	Semester/Year	Discipline

Yours sincerely,

(Head of Department/Principal)

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(ANNEXURE-II)

PROFORMA FOR EVALUATION OF INTERNSHIP BY INDUSTRY

Student Name: ……Evaluation Date: ……

Industry Supervisor Name: ……

Company/Organization: ……

Title of the Project: ……

Please evaluate your intern by indicating the frequency with which you observed the following behaviors:

Parameters	Max. Marks	Marks Given
Attendance and Punctuality	20	
Discipline and Professional Behavior	20	
Technical Knowledge and Understanding of Processes	30	
Practical Skills and Quality of Work	20	
Ability to Apply Theoretical Knowledge	20	
Problem Solving and Analytical Ability	10	
Communication and Interpersonal Skills	20	
Teamwork and Collaboration	10	
Internship Report/Documentation	20	
Presentation and Viva-Voce	30	
Total Marks	200	

Additional comments, if any:

Signature with seal of Industry supervisor

HR Manager

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(ANNEXURE-II)

INTERNSHIP REPORT

STUDENT'S DIARY/ DAILY LOG

The main purpose of writing daily diary is to cultivate the habit of documenting and to encourage the students to search for details. It develops the students' thought process and reasoning abilities. The students should record in the daily training diary the day to day account of the observations, impressions, information gathered and suggestions given, if any. It should contain the sketches & drawings related to the observations made by the students.

The daily training diary should be signed after every day by the supervisor/ in charge of the section where the student has been working. The diary should also be shown to the Faculty Mentor visiting the industry from time to time and got ratified on the day of his visit.

Student's Diary and Internship Report should be submitted by the students along with attendance record and an evaluation sheet duly signed and stamped by the industry to the Institute immediately after the completion of the training. It will be evaluated on the basis of the following criteria:

- Regularity in maintenance of the diary.
- Adequacy & quality of information recorded.
- Drawings, sketches and data recorded.
- Thought process and recording techniques used.
- Organization of the information.

INTERNSHIP REPORT

After completion of Internship, the student should prepare a comprehensive report to indicate what he has observed and learnt in the training period. The student may contact Industrial Supervisor/ Faculty Mentor/TPO for assigning special topics and problems and should prepare the final report on the assigned topics. Daily diary will also help to a great extent in writing the industrial report since much of the information has already been incorporated by the student into the daily diary. The training report should be signed by the Internship Supervisor, TPO and Faculty Mentor. The Internship report will be evaluated on the basis of following criteria:

i. Originality.

ii. Adequacy and purposeful write-up.

iii. Organization, format, drawings, sketches, style, language etc.

iv. Variety and relevance of learning experience.

v. Practical applications, relationships with basic theory and concepts taught in the course.

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(ANNEXURE-II)

MONITORING & EVALUATION OF INTERNSHIP

The industrial training of the students will be evaluated in three stages:

1. Evaluation by Industry.
2. Evaluation by faculty supervisor of Industry.
3. Evaluation through seminar presentation/viva-voce at the Institute.

1. EVALUATION BY INDUSTRY

The industry will evaluate the students based on the Punctuality, eagerness to learn, Maintenance of Daily Diary and skill test in addition to any remarks.

2. MONITORING/ SURPRISE VISIT BY TPO/ STAFF/ FACULTY MENTOR

TPO/Staff/ Faculty Mentor of the institutes will make a surprise visit to the internship site, to check the student's presence physically, if the student is found absent without prior intimation to the T & P Cell, entire training will be cancelled. Students should inform the TPO, faculty mentor as well as the industry supervisor at least one day prior to availing leave by email. Students are eligible to avail 1-day leave in 4 weeks and 2 days leave in 6 weeks of the internship period apart from holidays and weekly offs.

3. EVALUATION THROUGH SEMINAR PRESENTATION/VIVA-VOCE AT THE INSTITUTE

The student will give a seminar based on his training report, before an expert committee constituted by the concerned department as per norms of the institute. The evaluation will be based on the following criteria:

- Quality of content presented.
- Proper planning for presentation.
- Effectiveness of presentation.
- Depth of knowledge and skills.
- Attendance record, daily diary, departmental reports shall also be analyzed along with the Internship Report.

Seminar presentation will enable sharing knowledge & experience amongst students & teachers and build communication skills and confidence in students.

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