Veermata Jijabai Technological Institute (V.J.T.I)

(Central Technological Institute, Maharashtra State, INDIA)

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PROGRAMME NAME: DIPLOMA IN TEXTILE ENGINEERING

Programme Code	**: DTE**	**With Effect From Academic Year**	**: 2023-24**
Duration of Programme	**: 6 Semester**	**Duration**	**: 16 Weeks**
Semester	**: Sixth**	**Scheme**	**: R-2023**

Sr No	Course Title	Abbreviations	Course Type	Course Code	Total IKS Hrs for Sem.	Learning Scheme					Credits	Assessment Scheme												
						Actual Contact Hrs./Week			Self-Learning (Term Work + Assignment)	Notional Learning Hrs. /Week		Paper Duration (hrs.)	Theory					Based on LL & TL				Based on Self Learning		Total Marks
																		Practical						
						CL	TL	LL					FA-TH (MST)	SA-TH		Total		FA (CA)		SA (PR/OR)		SLA		
													Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
1	PROCESS CONTROL IN SPINNING	PCS	DSC	236TE61	-	3	-	3	-	6	3	3	30	70	28	100	40	25	10	25#	10	-	-	150
2	PROCESS CONTROL IN WEAVING	PCW	DSC	236TE62	-	3	-	3	-	6	3	3	30	70	28	100	40	25	10	25#	10	-	-	150
3	TECHNICAL TEXTILES-II	TT-II	DSC	236TE63	-	4	2	-	1	7	3.5	3	30	70	28	100	40	25	10	-	-	25	10	150
4	ELECTIVE	ELE	DSE	236TE64E	-	3	1	-	1	5	2.5	3	30	70	28	100	40	25	10	-	-	25	10	150
5	ENTREPRENEURSHIP AND STARTUPS	ESU	SEC	236TE65	-	-	-	2	1	3	1.5	-	-	-		-	-	50	20	-	-	50	20	100
6	INDUSTRY INSTITUTE INTERACTION	III	SEC	236TE66	-	-	-	2	-	2	1	-	-	-		-	-	50	20	-	-	-	-	50
7	PROJECT (MAJOR)	PRO	INP	236TE67	-	-	-	8	-	8	4	-	-	-	-	-	-	100	40	100#	40	-	-	200
Total					-	13	3	18	3	37	18.5		120	280		400		300		150		100		950

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# On Line Examination, @$ Internal Online Examination

Course Category: Discipline Specific Course Core (DSC): 3, Discipline Specific Elective (DSE):5, Value Education Course (VEC): 0, Intern/Apprentice/Project./Community (INP) : 1, Ability Enhancement Course (AEC) : 1, Skill Enhancement Course (SEC) : 2, Generic Elective (GE) : 0

Curriculum Coordinator

Head Diploma in Textile Engineering

Dean - Diploma

DIPLOMA PROGRAMME	**: DIPLOMA IN TEXTILE ENGINEERING**
PROGRAMME CODE	**: DTE**
SEMESTER	**: SIXTH**
COURSE TITLE	**: PROCESS CONTROL IN SPINNING**
COURSE CODE	**: 236TE61**

1.TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME												
CL	TL	LL	Self - learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
3	-	3	-	3	3	30	70	28	100	40	25	10	25#	10	-	-	150

Total IKS Hrs for Sem. : 0 Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

Course Category: Discipline Specific Course Core (DSC): 1

II.RATIONALE

The aim of any production activity is to produce desirable quality at minimum cost. It is imperative to understand the scope and role of process control in spinning. This course thoroughly prepares the students to meet the knowledge, skills, and attitude required to take on the challenges of day today working of a spinning mill. This course is designed to impart the students the knowledge of selection of raw material and the controlling the processes by using correct process parameters for the targeted achievements.

III.COURSE OUTCOMES (COs)

Students will be able to achieve the following COs on completion of course based learning

- CO1 Establish norms and standards for control of key variables and control of mixing quality
- CO2 Choose key variables for the spinning preparatory process.
- CO3 Take corrective steps in a spinning mill for energy conservation and machinery audit.
- CO4 Choose key variables for ring spinning department.
- CO5 Understand the control of key variables in rotor spinning and identify causes and remedies Package defects in rotor spinning.
- CO6 Define indices of productivity and measures to improve productivity.

IV. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION – I								
Unit & Sub-Unit		Topics/Subtopics	Hours	Marks	COs	R Level	U Level	A Level
1		**Principles of process control and Raw material control:** Evolving a system for process control, Role and scope for process control, Key variables for process control, establishing norms and standards, collection and interpretation of data, Taking corrective action **Control of mixing quality and cost:** Evaluation of cotton quality, traditional instruments, HVI and AFIS, Control of mixing through Fibre characteristics, FQI, Simultaneous control of mixing cost, quality index, Bale management using HVI. **Yarn Realization:** Definition and importance, Records for estimating yarn realization and waste, Norms for yarn realization of carded and combed yarn.	08	12	CO1	20%	40%	40%

2		**Process control in Spinning Preparatory departments** **Blow room:** methods of measurement, norms and control of trash con tent and cleaning efficiency, Waste losses, Lap uniformity C.V.% (within and between lap) and lap rejection. Bat control in Chute feed, Nep control. **Card and Draw frame:** Methods of measurement, norms and control of: a cleaning efficiency, Waste losses, Nep, Fibre rupture, CV% of sliver wrapping and U%. Sliver breakage rate. **Comber:** Methods of measurement, norms and control of Noil within comber and between combers, Influence of comber preparatory on comber performance, Nep, sliver uniformity and wrapping, Comber stoppages. **Speed frame:** Methods of measurement, norms and control of: CV% of sliver, wrapping and roving U%, Roving bobbin defects and roving breakage rate	10	15	CO2	20%	40%	40%
3		**Energy conservation and Machinery audit:** **Energy Conservation:** Significance of Energy Management in the Spinning Mill, Energy Conservation in the Spinning Mill. **Machinery Audit:** Definition, Implementation in each department in spinning and test instrument for machinery audit.	6	8	CO3	20%	40%	40%

SECTION – II								
Unit & Sub-Unit		Topics/Subtopics	Hours	Marks	Cos	R Level	U Level	A Level
4		**Process control in Ring frame department:** Methods of measurement, norms, and control of CV% of lea count variations (within and between bobbin count variations). Factors affecting spinning tension in ring spinning, Control of end breakage rate in ring spinning, Factors affecting end breakage rates, Control of fly generation and twist variations **Yarn U%, Yarn imperfections:** Random and periodic irregularity, Control of yarn irregularity and imperfections. **Yarn and package defects and remedies:** Slubs, crackers, spinners, doubles, slough-off, bad piecing, snarls, lapping, and Yarn hairiness.	10	15	CO4	40%	40%	20%
5		**Process control in Rotor spinning** Control of end breakage rate and twist loss, Causes and remedies for idle spindles, Control of yarn irregularities, Yarn and package defects and remedies	08	12	CO5	20%	40%	40%
6		**Productivity and Implementation of process control in Spinning:** Definition of Indices of Productivity and measurement of productivity, Measures to improve productivity, Maximizing efficiency in ring spinning.	06	08	CO6	20%	40%	40%
Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxanomy).								

V. LIST OF PRACTICALS

Sr. No.	Practical Title	No. of Hours	Relevant COs
1	Evaluate process control parameters in Blow room.	3	CO1
2	Calculate yarn realization.	3	CO1

3	Identify lea count variation by analysing within and between bobbin lea count variation.	3	CO1/CO2
4	Evaluate process control parameters in Card and Draw frame.	3	CO2
5	Evaluate process control parameters in Comber and Speed frame.	3	CO2
6	Determine losses in efficiency at ring frame.	3	CO4
7	Determine end breakage rate at ring frame and analyze causes for end breaks.	3	CO4
8	Compare variations in hank meter production of ring frame.	3	CO4
9	Classify and analyse defects and package faults produced at ring frame.	3	CO4
10	Determine within and between bobbin lea, CSP variations.	3	CO4
11	Evaluate process control parameters in Rotor.	3	CO5
12	Calculate productivity.	3	CO6
13	Calculate FQI.	3	CO6

VI. ASSESSMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)

- Midterm Test Exam
- Self-learning
- Term Work
- Seminar/Presentation

Summative Assessment (Assessment of Learning)

- End Term Exam
- Practical Performance

VII. SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes * (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO- 1	PSO- 2
CO1	3	3	3	-	1	-	3	2	1
CO2	3	3	3	1	1	1	3	2	1
CO3	3	3	3	2	3	1	3	2	1
CO4	3	3	3	1	1	1	3	2	1
CO5	3	3	3	1	1	1	3	2	1

CO6	3	3	3	-	-	-	3	2	-

Legends: High:03, Medium:02, Low:01, No Mapping: -

PSO1: Ability to apply knowledge of selecting raw materials, machines and process parameters using standard methods and engineering tools for designing solutions to meet specific needs of the textile industry.

PSO2: Understand the impact of textile processes in societal and environmental context and demonstrate the knowledge for sustainable development through teamwork and effective communication for lifelong learning.

VIII. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFERENCE BOOKS/WEBSITES

Author	Title	Publisher
Abhijit Majumdar, Apurba Das, R. Alagirusamy and V. K. Kothari	Process control in Textile Manufacturing	Woodhead Publishing
A. R. Garde, T. A. Subramanian	Process Control in Spinning	ATIRA Book Publications

Curriculum coordinator

Head of the Department

Dean Diploma

BOS VJTI Approval Dt. 23/5/2025

DIPLOMA PROGRAMME	**: DIPLOMA IN TEXTILE ENGINEERING**
PROGRAMME CODE	**: DTE**
SEMESTER	**: SIXTH**
COURSE TITLE	**: PROCESS CONTROL IN WEAVING**
COURSE CODE	**: 236TE62**

I.TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME												
CL	TL	LL	Self - learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
3	-	3	-	3	3	30	70	28	100	40	25	10	25#	10	-	-	150

Total IKS Hrs for Sem.: 0 Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

Course Category: Discipline Specific Course Core (DSC): 13

II. RATIONALE:

In the textile industry optimizing process parameters are essential for ensuring both efficiency and product quality. Students need to analyze the impact of these parameters and effectively interpret process-related data to achieve the required production, quality and manufacturing cost of textile products.

III. COURSE OBJECTIVES:

Student should able to

1. Acquire principles of process control of every stage of weaving
2. Study of relevant process control methodology in winding machines.
3. Understand relevant process control methodology in warping machines.
4. Know the relevant process control methodology in sizing machines.
5. Understand relevant process control methodology in weaving machines.
6. Know relevant process control methodology in Drawing -in machines.
7. Use the relevant process control methodology on fabric inspection.

IV. COURSE OUTCOMES (COs)

Students will be able to achieve the following COs on completion of course based learning

CO1	Apply principles of process control at every stage of weaving.
CO2	Select standard process variables to control winding and pirn winding processes to produce good quality material.
CO3	Adopt standard process control methodology in direct and sectional warping.
CO4	Control sizing process parameters to achieve required quality of beams.
CO5	Use the required process parameters to produce good quality drawn beams.
CO6	Produce woven fabric with required quality and specifications.

V. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION-I								
Unit & Sub Unit		**Topics/Sub-topics**	**Hours**	**Marks**	**CO**	**R Level**	**U Level**	**A Level**
1		**Introduction to Process Control:** Introduction to process control, Scope of process control and its approach, Loom productivity, Methodology of direct control, Setting Norms and Schedule of Checks, Machinery Audit.	4	8	CO1	20%	30%	50%
2		**Process control in Winding:** Scope and approach of process control in winding, Process control parameters of splicer, tensioner, cradle pressure, package hardness for the given winding machine, Optimizing quality of preparation, Unwinding tension variation during winding, Knot factor , realization, retained spliced strength, Control of Productivity, Package defects in winding, Control of Hard waste, Calculations. **Process control in Pirn winding:** Process Control in Pirn Winding, Minimizing End Breaks, Productivity Package defects in pirn winding, Control of Hard waste	12	17	CO2	20%	30%	50%
3		**Process Control in warping**	8	10	CO3	20%	30%	50%

		Scope of process control in warping Minimizing End Breaks in Warping Performance of Warping, Quality of Warping Beams, Control of Productivity, Package defects in warping, Control of Hard waste, Calculations.						

SECTION-II

Unit & Sub Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
4		**Process control in sizing:** Scope and approach to process control in sizing, Choice of size recipe and size pick up. Control of Size pick up, Control of yarn stretch, Control of Moisture in Sized yarns, Quality of Sized Beams, Devices for Improving weavability of Sized yarn Control of Productivity and Control of Size Losses, Package defects in sizing Control of Hard waste, Calculations.	10	15	CO4	20%	30%	50%
5		**Process control in Drawing in and Warp Tying:** Scope and approach, Precautions to be taken during drawing and tying of warp, Productivity, Control of Hard waste.	04	5	CO5	20%	30%	50%
6		**Process control for Productivity in loomshed:** Control of Productivity in Loomshed, Scope and approach, Control of Loom speed, Control of Loom efficiency, Control of Loom Stops, Methods to assess loom performance by snap study, quality round, loom data and centralized control, Expected loom efficiency on automatic and non-automatic loom and shuttleless looms, Fabric defects and its remedies, 4 point and 10 point fabric grading systems, Control of Hard waste, set norms for hard waste, Fabric value loss, Looms allocation.	10	15	CO6	20%	30%	50%

			48	**70**				

Legends: R- Remember, U – Understand, A – Apply and above levels (Bloom's Revised Taxonamy).

VI. LIST OF PRACTICALS

Sr. No.	Practicals	Approx. Hours	Relevant CO's
1	Prepare the list of process control studies with their norms in the following departments: 1) Winding 2) Warping, 3) Sizing 4) Drawing-in and Knotting5) Loomshed	3	CO1
2	i) Use winding machine to prepare the winding package. ii) Observe winding package faults and describe them iii) Calculate production and efficiency of winding machine	3	CO2
3	Report on the classmate yarn faults.	3	CO2
4	i) Use the warping machine to produce warper's beam. ii) Observe and report package defects in warping.	3	CO3
5	Calculate size add-on and size pick up of the given yarn.	3	CO4
6	Observe the drawing-in process on a loom.	3	CO5
7	Observe different types of healds, Reed, Drop pins used on shuttleless looms.	3	CO5, CO^
8	Prepare a report on the cleaning and lubrication schedule in different departments.	3	CO2, CO3, CO4, CO5, CO6
9	Collect information about 4 points and 10 points fabric grading methods and AI based technologies available in industry.	3	CO6
10	Loom running practice – Starting & stopping of loom – one pick Two pick – attending warp and weft breaks.	3	CO6
11	Determine loomshed efficiency by snap study.	3	CO6
12	Prepare a fabric with a given weft colour pattern on the loom.	3	CO6
13	Collect defective woven fabric samples and display it in your journal along with its causes and remedies.	3	CO6
14	Analyze the given fabric samples.	3	CO6

VII. ASSESSMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)

- Tutorials
- Midterm Test Exam
- Self-learning
- Term Work
- Seminar/Presentation

Summative Assessment (Assessment of Learning)

- End Term Exam
- Tutorial Performance

VIII. SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes * (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO- 1	PSO- 2
CO1	2	1	-	-	-	-	3	1	-
CO2	3	2	2	3	-	-	3	3	-
CO3	3	2	2	3	-	-	3	3	-
CO4	3	2	2	3	-	-	3	3	-
CO5	3	2	2	3	-	-	3	3	-
CO6	3	2	2	3	3	3	3	3	-

Legends :- High:03, Medium:02, Low:01, No Mapping: -

PSO1: Ability to apply knowledge of selecting raw materials, machines and process parameters using standard methods and engineering tools for designing solutions to meet specific needs of the textile industry.

PSO2: Understand the impact of textile processes in societal and environmental context and demonstrate the knowledge for sustainable development through teamwork and effective communication for lifelong learning.

IX. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFERENCE BOOKS/WEBSITES

Sr. No	Author	Title	Publisher
1	Paliwal and Khimothi,	Process control in weaving	Published by ATIRA, 1974.
2	Mujumdar, Abhijit; Apurba Das, R.Alagirusamy, Kothari V.K.	Process Control in Textile Manufacturing	Woodhead Publishing India,2013, ISBN:0857090275
3	Dr. Mukesh Kumar Singh	Industrial Practices in Weaving preparatory	Woodhead Publishing India,2014 ISBN: 9789380308296

X. LEARNING WEBSITES & PORTALS:

Sr. No.	Link / Portal	Description
1	https://nptel.ac.in/courses/116102005	Process control in warping, sizing, loom shed
2	https://mytextilenotes.blogspot.com/2008/09/process-control-in-warping-2.html	Process control in warping
3	https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SFDA1301.pdf	Traditional Weaving Techniques

Curriculum Coordinator

Head of the Department

Dean Diploma

BOS VJTI Approval Dt. 23/5/2025

DIPLOMA PROGRAMME	**: DIPLOMA IN TEXTILE ENGINEERING**
PROGRAMME CODE	**: DTE**
SEMESTER	**: SIXTH**
COURSE TITLE	**: TECHNICAL TEXTILES - II**
COURSE CODE	**: 236TE63**

1.TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME												
CL	TL	LL	Self - learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
4	2	-	1	3.5	3	30	70	28	100	40	25	10	-	-	25	10	150

Total IKS Hrs for Sem.: 0 Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

Course Category: Discipline Specific Course Core (DSC): 1

II.RATIONALE

The field of technical textiles is rapidly evolving, playing a critical role in various industries such as healthcare, automotive, construction, filtration, sports, and industrial manufacturing. Unlike traditional textiles, technical textiles are engineered to provide specific functional properties such as high strength, durability, thermal and chemical resistance, and enhanced performance. This course is designed to equip students with specialized knowledge and practical skills in the production, processing, and application of technical textiles across multiple sectors. The course offers a comprehensive curriculum covering key domains of technical textiles, including filtration fabrics, automotive and protective textiles, geotextiles, sports textiles, medical textiles, fabric coating and lamination, and industrial yarns and fabrics.

III. COURSE OUTCOMES (COs)

Students will be able to achieve the following COs on completion of course based learning

- CO1 – Explain significance of textile reinforcement and matrix and compare various composite manufacturing methods
- CO2 – Describe the filtration mechanisms, analyze and identify filter fabrics and equipment used in industrial filtration systems
- CO3 – Analyze textile material requirements and performance properties for automotive and sports applications
- CO4 – Differentiate between coating and lamination techniques
- CO5 – Apply the knowledge of types, materials in protective and defense textiles
- CO6 – Identify production methods and applications of various industrial yarns and specialty fabrics

IV. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION – I								
Unit & Sub-Unit		Topics/Subtopics	Hours	Marks	COs	R Level	U Level	A Level
1		**Textile Composites**	**08**	**09**	CO1	40%	40%	20%
	1.1	Reinforcement materials, Matrix materials, Classification of textile reinforcement structures, Preforms, Prepegs.	03					
	1.2	Manufacturing methods: Hand and Machine lay-up, Vacuum bag and pressure bag moulding, Injection moulding, Autoclave, Pultrusion, Compression moulding, Resin Transfer moulding	04					
	1.3	Composite Testing- Compression test, Flexural test, Impact toughness test, inter-laminar shear strength test	01					
2		**Filtration fabrics**	**12**	**13**	CO2	40%	40%	20%
	2.1	Definition, objective, Mechanism of dry filtration: Interception, Inertial deposition, Random diffusion, Electrostatic deposition, Gravitational forces	03					
	2.2	Mechanism of wet filtration: Screening, Depth filtration, Cake filtration Filter design for dry filtration	03					

	2.3	Filtration Equipments: Filter bags, Rotary drum filters, Rotary disk filters, filter press, Belt filters Dry filtration: Dust Filters – Filters in air conditioning e.g. HVAC, HEPA and ULPA Wet filtration: Solid-liquid separation, e.g. bolting cloth.	06					
3		**Automotive and Sport textiles**	**12**	**13**	CO3	40%	40%	20%
	3.1	Automotive Textiles: Seat belts, air bags, seat covers, Tyre cord fabrics (tyre cord yarn), Roof liners	06					
	3.1	Nets, balls, sports surfaces (Artificial grass and Needle punch pile grass): Types and properties	04					
	3.2	Sportswear and Sports footwear: Property requirements, Stretch fiber and fabrics (lycra)	02					

SECTION – II

Unit & Sub-Unit		Topics/Subtopics	Hours	Marks	COs	R Level	U Level	A Level
4		**Fabric Coating and Lamination**	**08**	**09**	CO4	40%	40%	20%
	4.1	Coating: Coating techniques such as knife coating, Calendar coating, roller, nip, dip and cast coating, Extrusion coating, spray coating, Foam coating, Powder coating	06					
	4.2	Laminates: Classification – Rigid, Flexible Fabric & Waterproof breathable laminates	02					
5		**Protective and Defense Textiles**	**12**	**13**	CO5	40%	40%	20%
	5.1	Protective clothing: Ballastic Protection-principle, Fibers and Fabrics used, Chemical and Biological Protection, Nuclear Protection, Environment Protection, Camouflage bulletproof fabrics, flame retardant fabrics, Knife and Slash/cut resistance	08					
	5.2	Defense Textiles: Parachute fabrics, tent fabrics: Yarn and fabric properties	04					
6		**Industrial Yarns and Fabrics**	**12**	**13**	CO6	40%	60%	-
	6.1	Industrial Yarns: Conductive yarn, Rope Types-methods of production and applications, functional requirements, structure and properties	02					

	6.2	Industrial Fabrics: Multiaxial warp knitted, Triaxial fabric: Knotted Fabric, Braided Fabric_ Structure, properties and applications	05					
	6.3	3D Textiles: Woven, Knitted and Nonwoven – Types, advantages and applications	05					
Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxanomy).								

V. LIST OF ASSIGNMENTS/TUTORIALS

Sr. No.	Practical/Assignment/Tutorial Title	No. of Hours	Relevant COs
1	Study the flame retardant property of fabrics	2	CO5
2	Study the impact resistance for Textile Composite	2	CO1
3	Study the moisture absorption property for fabrics	2	CO3
4	Study the filtration properties for woven /nowoven fabrics	2	CO2
5	Study of braided / knotted / multiaxial fabric structure	2	CO6
6	Study the tensile properties for high performance yarn / fabric	2	CO6
7	Study the application of narrow fabrics / webbings	2	CO6
8	Collect one flexible and one rigid textile composite and explain its use for the application for it is manufactured.	2	CO4

VI. LIST OF SELF LEARNING ASSIGNMENTS

Sr. No.	Self Learning Assignment Title	No. of Hours	Relevant COs
1	Identify one Indian company manufacturing composite part for specialized application (e.g., for aerospace, automotive, or wind energy). Briefly describe the product and process and the tests required for that application	1	CO1
2	Explain dry and wet filtration mechanisms. Describe the design considerations of filter fabrics for one common industrial application. Study the Indian and global demand for HEPA/ULPA filters	1	CO2
3	Discuss the use of technical textiles in automotive and sports for seat belts, airbags, sports shoes and artificial turf. Identify the Indian sports equipment manufacturers and sports brands manufacturing / using textiles materials.	1	CO3
4	Compare the coating techniques (knife, dip, foam, powder, extrusion). Examine any two coated textile products for its given applications.	1	CO4
5	Write a detailed report on textile materials used for ballistic and environmental protection. Include fiber type, fabric structure, and performance standards.	1	CO5
6	Discuss the structure, properties, and uses of the following industrial fabrics: i) Multiaxial warp knitted fabric, ii) Triaxial woven fabric and iii) Knotted and braided fabrics	1	CO6

VII. ASSESSMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)

- Tutorials
- Midterm Test Exam
- Self-learning
- Term Work
- Seminar/Presentation

Summative Assessment (Assessment of Learning)

- End Term Exam
- Tutorial Performance

VIII. SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes * (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO- 1	PSO- 2
CO1	3	1	1	-	1	-	1	3	2
CO2	3	1	1	-	2	-	2	3	1
CO3	3	1	1	-	1	-	2	3	2
CO4	3	1	1	-	1	-	2	3	2
CO5	3	1	1	-	1	-	2	3	2
CO6	3	1	1	-	1	-	2	3	2

Legends: High:03, Medium:02, Low:01, No Mapping: -
PSO1: Ability to apply knowledge of selecting raw materials, machines and process parameters using standard methods and engineering tools for designing solutions to meet specific needs of the textile industry.
PSO2: Understand the impact of textile processes in societal and environmental context and demonstrate the knowledge for sustainable development through teamwork and effective communication for lifelong learning.

XI. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFERENCE BOOKS/WEBSITES

Sr. No	Author	Title	Publisher

1	Sabit Adanaur	Wellington Sear's Handbook of Industrial Textiles	Technomic Publishing Co. Inc, 1995
2	Edited by A R Horrocks and S C Anand	Handbook of Technical Textiles	Woodhead Publication Ltd, 2000
3	R. H. Gong	Specialist yarn and fabric structures	Woodhead publishing limited
4	Anand, Subhash C. & Horrocks, A. Richard	Handbook of Technical Textiles (Second Edition), Volume 2: Technical Textile Applications	Woodhead Publishing, 2016
5	R. Senthil Kumar	Textiles for industrial applications	CRC Press, Taylor & Francis Group
6	Jinlian HU	3D Fibrous Assemblies - Properties, Applications and Modelling of Three-Dimensional Textile Structures	Woodhead Publishing in Textiles:

X. LEARNING WEBSITES & PORTALS

Sr. No	Link / Portal	Description
1	https://nptel.ac.in/courses/116102057	Technical Textiles, IIT Delhi Dr. Apurba Das
2	https://puritytex.com/ https://www.rpfedder.com/	Filtration Textiles
3	https://www.beekaylon.com/automotive https://www.freudenberg-pm.com/markets/automotive	Automotive Textiles

Curriculum coordinator

Head of the Department

Dean Diploma

BOS VJTI Approval Dt. 23/5/2025

DIPLOMA PROGRAMME	**: DIPLOMA IN TEXTILE ENGINEERING**
PROGRAMME CODE	**: DTE**
SEMESTER	**: SIXTH**
COURSE TITLE	**: MAINTANENCE MANAGEMENT (Elective)**
COURSE CODE	**: 236TE64E1**

I. TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME												
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
3	1	-	1	2.5	3	30	70	28	100	40	25	10	-	-	25	10	150

Total IKS Hrs for Sem.: 0 Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

Course Category: Discipline Specific Elective (DSE) :1

II. COURSE OUTCOMES (COs)

Students will be able to achieve the following COs on completion of course based learning

CO1	Understand the need of maintenance, its functions, types, planning & scheduling
CO2	Understand the maintenance practices in spinning preparatory & spinning processes
CO3	Understand the concepts of maintenance audit, SQC synchronization and recording the maintenance activities.
CO4	Understand the maintenance practices in weaving preparatory & weaving processes.
CO5	Understand the purpose of maintenance budgeting and costing.
CO6	Understand the basic and resent trends in maintenance managements

III. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION-I								
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		**Introduction**	**8**	**12**				
	1.1	Concept, importance & objectives of maintenance management breakdown, function and responsibility of maintenance department.		05	CO1	30%	50%	20%
	1.2	Planning, steps in planning, planning techniques, scheduling principles, schedule type and techniques, PERT, CPM and other technique for planning		07	CO1	20%	40%	40%
2		**Spinning Department**	**8**	**13**	CO2	30%	30%	40%
	2.1	Spinning Preparatory, Schedules, precaution and method to be followed during maintenance activities, tools and gauges used for maintenance.						
	2.2	Ring frame & Rotor Spinning Machine, schedules, staff, precaution & methods to be followed, Tools & gauges and lubricant used. Study of aprons & cots used in spinning & their maintenance.						
3		**Machine Audit and SQC**	**8**	**10**	CO3	20%	40%	40%
	3.1	Machine audit – concept and auditing of spinning and weaving machines. Energy conservation in spinning						
	3.2	SQC synchronization with maintenance – SQC activities useful for maintenance in various departments of spinning and weaving.						

SECTION-II								
Unit & Sub Unit		Topics/Sub-topics	Hours	Mark s	CO	R Leve l	U Leve l	A Leve l
4		**Weaving Department**	**8**	**13**	**CO4**	**30%**	**30%**	**40%**
	4.1	Weaving preparatory machines, schedules, critical points of maintenance, precautions to be taken during maintenance operations.						
	4.2	Maintenance of plain & auto loom - Schedules, critical points, precautions, auditing of plain & auto loom. Maintenance of shuttle less weaving machines. Critical maintenance points of various shuttle less						

		weaving machines and different lubricants.						
5		**Maintenance budgeting, costing and cost control**	**8**	**10**	**CO5**	**30%**	**30%**	**40%**
	5.1	Introduction, classification of maintenance cost, maintenance cost components, maintenance cost analysis, purpose of cost control, maintenance budget						
6		**TERO Technology**	**8**	**12**	**CO6**	**30%**	**30%**	**40%**
	6.1	Latest concepts training (HRD) of maintenance personal safety assessment, work environment, fire prevention and control, management of emergencies.						
			48	70				
Legends: R- Remember, U – Understand, A – Apply and above levels (Bloom's Revised Taxonamy).								

V. LIST OF TUTORIALS

Sr. No.	Tutorial Title	Approx. Hours	CO
1	Explain the importance of maintenance management in textile industry	2	CO1
2	Describe the different types of maintenance with suitable example.	2	CO1
3	Explain the concept of PERT and CPM with example	2	CO1
4	Explain the different charts used for maintenance in spinning department.	2	CO2
5	Explain the different tools and gauges used for maintenance in textile industry.	2	CO2
6	Explain the importance of machine audit with suitable example.	2	CO3
7	Explain the role and activity of SQC department in spinning department.	2	CO3
8	Explain the different charts used for maintenance in Weaving preparatory department.	2	CO4
9	Explain the precaution need to take for shuttleless loom to avoid breakdown maintenance.	2	CO4
10	Explain the need to control the maintenance cost.	2	CO5
11	Explain the personal safety measures need to take during maintenance of machinery.	2	CO6
12	Describe the emergencies may occur during maintenance process.	2	CO6
13	Explain the importance of training in the industry.	2	CO6

VI. LIST OF SELF LEARNING ASSIGNMENT

Sr. No.	Self Learning Assignment Title	Approx. Hours	Learning CO
1	Explain the concept of maintenance management in textile.	1	CO1
2	Explain the effect advantages and disadvantages of spinning maintenance.	1	CO2
3	Corelate the activity associate with the machine audit and SQC.	1	CO3
4	Explain the role of effective maintenance in the weaving.	1	CO4
5	Elaborate on the cost factor related with the maintenance.	1	CO5
6	Explain about new concept about maintenance management and sustainability.	1	CO6

VII. ASSESSMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)

- Tutorials
- Midterm Test Exam
- Self-learning
- Term Work
- Seminar/Presentation

Summative Assessment (Assessment of Learning)

- End Term Exam
- Tutorial Performance

VIII. SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Program me Specific Outcomes * (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Developmen t of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO- 1	PSO- 2
CO1	3	1	1	3	1	-	3	2	1
CO2	3	3	2	3	2	1	3	3	2
CO3	3	2	2	3	3	1	3	3	2
CO4	3	3	2	3	2	1	3	3	2
CO5	3	3	1	1	1	1	3	3	2
CO6	3	2	1	3	2	1	3	3	3

Legends: High:03, Medium:02, Low:01, No Mapping: -
PSO1: Ability to apply knowledge of selecting raw materials, machines and process parameters using standard methods and engineering tools for designing solutions to meet specific needs of the textile industry.
PSO2: Understand the impact of textile processes in societal and environmental context and demonstrate the knowledge for sustainable development through teamwork and effective communication for lifelong learning.

VIII. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFERENCE BOOKS/WEBSITES

Sr. No	Author	Title	Publisher
1	T. V. Ratnam & K. P. Chellamani	Maintenance Management in Spinning	5th Ed, SITRA
2	A. T. Shahani, B.P.Todankar, C. K. Mistry and N. Balasubramanian	Maintenance in Ring Spinning	
3	T. Granovsky	Repair and Adjustment of Textile Machineries	MIR publisher Moscow (1984)

Curriculum Coordinator | Head of the Department | Dean Diploma

BOS VJTI Approval Dt. 23/5/2025

DIPLOMA PROGRAMME	**: DIPLOMA IN TEXTILE ENGINEERING**
PROGRAMME CODE	**: DTE**
SEMESTER	**: SIXTH**
COURSE TITLE	**: NANOTECHNOLOGY AND COMPOSITES (Elective)**
COURSE CODE	**: 236TE64E2**

I. TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME												
CL	TL	LL	Self - learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
3	1	-	1	2.5	3	30	70	28	100	40	25	10	-	-	25	10	150

Total IKS Hrs for Sem.: 2 Hrs

Abbreviations: CL- Classroom Learning , TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

Course Category: Discipline Specific Elective (DSE) : 1

II. COURSE OUTCOMES (COs)

Students will be able to achieve the following COs on completion of course based learning

CO1	Understand the field of nanomaterial's used in the textile and allied area.
CO2	Understand the methodology and design of Nano science and technology
CO3	Understand the emerging challenges and opportunity in the advance textile area.
CO4	Understand the importance of composites in Textile filed.
CO5	Understand the principle and production process of composite.
CO6	Understand application of textile composites in various field of engineering.

III. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION-I								
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		**Introduction to Nanotechnology:**	**8**	**12**	**CO1**	**30%**	**30%**	**40%**
		Fundamental of Nano science Nanotechnology, Introduction to nanomaterial: Definition, Concept, Requirement						
2		**Production of Nano materials:**	**10**	13	**CO2**	**30%**	**30%**	**40%**
		Principle and production of Nano materials, nanoparticles, nonosphers etc. Top down and bottom down approaches for production of Nano materials. Electro-spinning technique						
3		**Nanofibers and Nano finishes for Textile Applications:**	**6**	**10**	**CO3**	**20%**	**40%**	**40%**
		Production of Nano fibers, Applications of Nano fibers. Anti-microbial fabric other advanced technique in field of various engineeringg. Nano formulations for dyes, Nano coatings and Nano finishing.						
SECTION-II								
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
4		**Introduction to Composites**	6	10	CO4	30%	30%	40%
		Importance of composites materials, Classification and fiber formation, composition, structure, properties.						
5		**Principle, Classification and Characterization**	10	13	CO5	30%	30%	40%
		Classification of composites on the basis of reinforcement and matrix, Major composite classes: polymer matrix, metal matrix, ceramic matrix, carbon, and intermetallic composites. Hybrid composites, Laminated composites.						
		Introduction to testing technique (SEM, XRD, AFM, TEM, Particle size and Particle size distribution, Stability etc).						
6		**Applications of composites**	8	12	CO6	30%	30%	40%

		Applications of advanced composite materials. Environmental effects in Composites, Green composites.; Synthesis and Properties of Nano composites.						
			48	**70**				

Legends: R- Remember, U – Understand, A – Apply and above levels (Bloom's Revised Taxonamy).

V. LIST OF TUTORIALS

Sr. No.	Tutorial Title	Approx. Hours	CO
1	Explain the concept of nanotechnology used in textile	2	CO1
2	Compare the conventional product with advance incorporated through nanotechnology.	2	CO1
3	Explain any textile application made up of nanomaterial.	2	CO2
4	Explain the nanomaterial synthesisation of any materials.	2	CO2
5	Explain the different applications of AgO2 in textile.	2	CO3
6	Explain the application of nanomaterial with lamination and coating method.	2	CO3
7	Describe the application of textile composite material in transportation.	2	CO4
8	Compare the conventional and composite material.	2	CO4
9	Explain the different types of characterization used in composite.	2	CO5
10	Explain different types of composite with their application.	2	CO5
11	Explain the application of nanotechnology and composite to maintain environmental balance.	2	CO6

VI. LIST OF SELF LEARNING ASSIGNMENT

Sr. No.	Self Learning Assignment Title	Approx. Hours	Learning CO
1	Explain the available textile products using nanotechnology application.	02	CO1
2	Explain the lamination and coating technology used in nanotechnology application in textile.	02	CO2
3	Explain the different material used in nanotechnology for specific application.	02	CO3
4	Explain the different application of composite material in mobitech.	02	CO4
5	Explain the different fibre used in composite material with their specific property.	02	CO5
6	Explain the advancement in the testing of composite materials.	02	CO6

VII. ASSESSMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)

- Tutorials
- Midterm Test Exam
- Self-learning
- Term Work
- Seminar/Presentation

Summative Assessment (Assessment of Learning)

- End Term Exam
- Tutorial Performance

VIII. SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes * (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO- 1	PSO- 2
CO1	3	-	3	2	2	1	1	3	2
CO2	3	2	2	2	2	1	2	3	2
CO3	3	-	2	1	3	1	2	2	2
CO4	3	-	3	2	2	1	1	3	2
CO5	3	2	2	2	2	1	2	3	2
CO6	3	-	2	1	3	1	2	2	2

Legends :- High:03, Medium:02, Low:01, No Mapping: -

PSO1: Ability to apply knowledge of selecting raw materials, machines and process parameters using standard methods and engineering tools for designing solutions to meet specific needs of the textile industry.

PSO2: Understand the impact of textile processes in societal and environmental context and demonstrate the knowledge for sustainable development through teamwork and effective communication for lifelong learning.

IX. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFERENCE BOOKS/WEBSITES

Sr. No	Author	Title	Publisher
1	P Brown and K Stevens	Nano fibers and nanotechnology in textiles	USA Woodhead
2	Long A C	Design and Manufacture of Textile Composites	Woodhead Publishing Ltd., U. K, 2005.
3	Adanur, S., and Ascioglu, B.	Processing Characterization of PVA Nano fibers in Electro spinning	Hilton Head
4	Gupta L.	Advanced Composite Materials	Himalayan Books

Curriculum Coordinator

Head of the Department

Dean Diploma

BOS VJTI Approval Dt. 23/5/2025

DIPLOMA PROGRAMME	**: DIPLOMA IN TEXTILE ENGINEERING**
PROGRAMME CODE	**: DTE**
SEMESTER	**: SIXTH**
COURSE TITLE	**: SUSTAINABLE TEXTILES (Elective)**
COURSE CODE	**: 236TE64E3**

1.TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME												
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
3	1	-	1	2.5	3	30	70	28	100	40	25	10	-	-	25	10	150

Total IKS Hrs for Sem.: 0Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

Course Category: Discipline Specific Elective (DSE): 1

II.RATIONALE

This course will provide students with a comprehensive knowledge in sustainability of textiles, problems in the process, eco labeling, life cycle assessment. Students will also be able to learn the 4 R's of sustainability- recycle, reuse, reduce and recover and how to make use of these in day to day life

III.COURSE OUTCOMES (COs)

Students will be able to achieve the following COs on completion of course based learning

CO1: Evaluate concepts of sustainability and life cycle assessment

CO2: Understand the key issues and ethical practices

CO3: Summarize the sustainability in raw materials

CO4: Discuss eco labeling for apparel

CO5: Understand sustainable chemical processing

CO6: Demonstrate recycling of textile products

IV. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION – I								
Unit & Sub-Unit		Topics/Subtopics	Hours	Marks	Cos	R Level	U Level	A Level
1		Concepts of Sustainability, Benefits of Sustainability, 4 R's of Sustainability- Reuse, Recycle, Reduce, Recover.	6	10	CO1	40%	40%	20%
	1.1	Introduction to concept of Life Cycle Assessment and Carbon Footprint						
2		Key issues of Sustainability in textiles: problems and how to address them, ethical practices, certifications, compliances	6	10	CO2	40%	40%	20%
3		Sustainable Raw materials: Natural fibres, Manmade fibres, Challenges and future trends	12	15	CO3	40%	40%	20%
SECTION – II								
Unit & Sub-Unit		Topics/Subtopics	Hours	Marks	Cos	R Level	U Level	A Level
4		Eco-labeling for textiles and apparel: Key principles of eco labeling, standards and eco labeling for textiles	8	12	CO4	40%	40%	20%
5		Sustainable chemical processing in Textiles: Introduction, challenges, solutions, achieving results	8	13	CO5	40%	40%	20%
6		Sustainability in Recycling of Textile products: Waste management, recycling constituents and future trends	8	10	CO6	40%	40%	20%
Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxanomy).								

V. LIST OF TUTORIALS

Sr. No.	Tutorial Title	No. of Hours	Relevant COs
1	Explain the benefits of sustainability in the textile industry with real-life examples.	1	CO1
2	Compare the environmental impacts of sustainable vs. non-sustainable textile production methods.	1	CO1
3	Summarize Life Cycle Assessment (LCA)? List its key phases.	1	CO1
4	Choose a textile product and outline its LCA stages, from raw material extraction to disposal.	2	CO1
5	Identify three key sustainability issues in the textile industry.	1	CO2

6	List five examples of natural fibres and five examples of manmade fibres used in sustainable textiles.	2	CO3
7	Select a sustainable fiber and create a brief report on its production process, benefits, and challenges.	1	CO3
8	Describe how a well-known textile brand uses eco-labelling to promote its sustainability efforts	2	CO4
9	Identify five sustainable chemicals or dyes used in textile processing.	1	CO5
10	Choose a textile processing stage and describe how eco-friendly chemicals can be used instead of harmful ones.	1	CO5
11	List down three methods used to recycle textile waste and explain briefly	1	CO6
12	Research a recycled textile product and explain the process	1	CO6

VI.ASSESSMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)

- Tutorials
- Midterm Test Exam
- Self-learning
- Term Work

Summative Assessment (Assessment of Learning)

- End Term Exam
- Tutorial Performance
- self learning assignments

VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SELF LEARNING)

Seminar:

1. Role of Life Cycle Assessment in achieving textile sustainability
2. Innovations in eco-friendly dyes and chemicals
3. Impact of textile recycling on environmental conservation

Assignment:

1. Compare the environmental footprint of cotton and bamboo fiber production
2. List key eco-labels used globally for textiles and their certification criteria
3. Identify and explain three common sustainable issues in textile wet processing

Micro Project:

1. Conduct a mini LCA of a common textile product

2. Develop a poster or brochure explaining the 4 R's of sustainability in textile industry
3. Prepare a sample database of sustainable raw materials and their sources
4. Create a simple prototype or report on textile waste recycling methods used locally

Note:

- Above is just a suggestive list of microprojects and assignments; faculty must prepare their own bank of microprojects, assignments, and activities in a similar way.
- The faculty must allocate judicial mix of tasks, considering the weaknesses and / strengths of the student in acquiring the desired skills.
- If a microproject is assigned, it is expected to be completed as a group activity.
- SLA marks shall be awarded as per the continuous assessment record.

VIII. SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Program me Specific Outcomes * (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Developmen t of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO- 1	PSO- 2
CO1	3	1	1	1	3	1	2	1	3
CO2	3	2	1	1	3	1	3	1	3
CO3	3	2	1	1	3	1	3	1	3
CO4	3	1	1	1	3	1	3	1	3
CO5	3	1	1	1	3	1	3	1	3
CO6	3	2	1	1	3	1	3	1	3

Legends :- High:03, Medium:02, Low:01, No Mapping: -

PSO1: Ability to apply knowledge of selecting raw materials, machines and process parameters using standard methods and engineering tools for designing solutions to meet specific needs of the textile industry.

PSO2: Understand the impact of textile processes in societal and environmental context and demonstrate the knowledge for sustainable development through teamwork and effective communication for lifelong learning.

IX . SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFERENCE BOOKS/WEBSITES

Author	Title	
Subramanian Senthil kannan Muthu	Sustainable Fibers and Textiles	Woodhead Publishing
R. S. Blackburn	Sustainable textiles Life cycle and environmental impact	Woodhead Publishing
Marion,Tobler-Rohr	Handbook of Sustainable Textile Production	Woodhead Publishing
Subramanian Senthil kannan Muthu	Life Cycle Assessment for Sustainable Textiles: Environmental and Chemical Risk Aspects	Springer

Curriculum Coordinator

Head of the Department

Dean Diploma

BOS VJTI Approval Dt. 23/5/2025

DIPLOMA PROGRAMME	**: DIPLOMA IN TEXTILE ENGINEERING**
PROGRAMME CODE	**: DTE**
SEMESTER	**: SIXTH**
COURSE TITLE	**: RECYCLED TEXTILES AND CIRCULARITY (Elective)**
COURSE CODE	**: 236TE64E4**

I. TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME												
CL	TL	LL	Self-learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
3	1	-	1	2.5	3	30	70	28	100	40	25	10	-	-	25	10	150

Total IKS Hrs for Sem.: 0 Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

Course Category: Discipline Specific Elective (DSE) :1

II. COURSE OUTCOMES (COs)

Students will be able to achieve the following COs on completion of course based learning

CO1	Illustrate the introduction to Sustainable Textiles and Circular Economy
CO2	Acquire knowledge of Textile Waste and Recycling
CO3	Understand Materials and Fibers in Recycled Textiles
CO4	Acquire knowledge of Circular Design and Business Models
CO5	Understand the Use of Environmental and Social Impacts of Recycled Textiles
CO6	Know Future of Recycled Textiles and Circular Economy

III. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION-I								
Unit & Sub-Unit		Topics/Sub-topics	Hours	Marks	CO	R Level	U Level	A Level
1		**Introduction to Circular Textiles**	**4**	**8**	**CO1**	**30%**	**40%**	**30%**
		Definition of sustainability in textiles Principles of a circular economy, Global challenges and environmental impact of textile production, Circular economy vs. linear economy in textiles						
2		**Textile Waste and Recycling**	**10**	**15**	**CO2**	**30%**	**40%**	**30%**
		Types of textile waste (pre-consumer vs. post-consumer waste), Challenges in textile waste management, Methods of textile recycling: (Mechanical recycling Chemical recycling, Biological recycling), The role of sorting technologies in textile recycling						
3		**Materials and Fibers in Recycled Textiles**	**10**	**12**	**CO3**	**30%**	**40%**	**30%**
		Types of fibres commonly used in textiles (natural, synthetic, and blended) Characteristics of fibers suitable for recycling , Recycled fibers and their properties (e.g., recycled polyester, cotton, wool), Innovations in fibre development (bio-based and biodegradable fibers)						
SECTION-II								
Unit & Sub-Unit		Topics/Sub-topics	Hours	Mark s	CO	R Leve l	U Leve l	A Leve l
4		**Circular Design and Business Models**	**8**	**12**	**CO4**	**30%**	**40%**	**30%**
		Principles of circular design in the textile industry, Design for disassembly, durability, and recyclability, Business models for circular fashion (e.g. take-back schemes, closed-loop systems), Extended Producer Responsibility (EPR) and its role in promoting circularity						
5		**Environmental and Social Impacts of Recycled Textiles**	**8**	**11**	**CO5**	**30%**	**40%**	**30%**
		Environmental benefits of recycling textiles (energy savings, water usage, CO2 reduction), Social implications of circular						

		textiles (fair labour, community development), Ethical issues and standards (e.g. Certifications for recycled products, Life cycle assessment (LCA) of recycled textile products						
6		**Future of Recycled Textiles and Circular Economy**	**8**	**12**	**CO6**	**30%**	**40%**	**30%**
		Introduction to ESG, Emerging trends and innovations in textile recycling, The role of collaboration among stakeholders (manufacturers, consumers, policymakers),Future challenges and opportunities in textile circularity, Marketing and Consumer Behavior in Circular Textiles, Consumer perceptions of recycled textiles Branding and marketing strategies for circular products ,Challenges in changing consumer behaviour towards sustainability ,The role of transparency and traceability in consumer trust						
Legends: R- Remember, U – Understand, A – Apply and above levels (Bloom's Revised Taxoam).								

IV.LIST OF PRACTICALS/ASSIGNMENTS/TUTORIALS

Sr. No.	Tutorial Title	Approx. Hours	CO
1	Test different recycled fabrics for durability, comfort, and quality	1	CO1
2	Learn and apply textile recycling processes like sorting, cleaning, and processing waste textiles	1	CO1
3	Understand a lifecycle assessment of a product made from recycled textiles	1	CO1
4	Identify types of textile waste generated, and propose methods to minimize or recycle these materials.	1	CO2
5	Identify different strategies for textile recycling, waste reduction, and circular business models.	1	CO3
6	Explore the use of textile waste as a resource for energy generation.	1	CO3
7	Investigate and analyze companies or brands that are successfully implementing textile recycling and circularity.	1	CO3
8	Develop a business model for a circular fashion brand that uses only recycled textiles and has a closed-loop system	1	CO4
9	Compare the durability, performance, and environmental impact of recycled fabrics versus virgin fabrics	1	CO5
10	Identify types of textile waste generated, and propose methods to minimize or recycle these materials	1	CO6

VI. LIST OF SELF LEARNING ASSIGNMENTS

Sr. No.	Self-Learning Assignment Title	Hours	Relevant COs
1	Find and write down 3 interesting facts about textile waste in your country.	1	CO1
2	Create a timeline showing how a cotton t-shirt can go from new to recycled.	1	CO1
3	Draw and explain 3 recycling symbols found on textile products or packaging.	1	CO3
4	Draft a simple plan for a clothing swap event in your class.	1	CO3
5	Make a table showing biodegradable vs. non-biodegradable fabrics.	1	CO3
6	List 5 common textile materials that can be recycled.	1	CO3
7	List 5 brands that promote sustainable fashion.	1	CO3
8	List down the process for steps in the textile recycling process	1	CO3
9	Draw the circular fashion lifecycle.	1	CO4
10	Visit a local thrift store or recycling centre and write your experience.	1	CO5

VII. ASSESSMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)

- Tutorials
- Midterm Test Exam
- Self-learning
- Term Work
- Seminar/Presentation

Summative Assessment (Assessment of Learning)

- End Term Exam
- Tutorial Performance

VIII. SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes * (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO- 1	PSO- 2
CO1	3	2	-	1	3	1	3	3	3
CO2	3	2	-	1	3	1	3	3	3
CO3	3	2	-	1	3	1	3	3	3
CO4	2	2	-	1	3	1	3	3	3
CO5	2	2	-	-	3	1	3	3	3
CO6	2	2	-	1	3	1	3	3	3

Legends: - High:03, Medium:02, Low:01, No Mapping: -
PSO1: Ability to apply knowledge of selecting raw materials, machines and process parameters using standard methods and engineering tools for designing solutions to meet specific needs of the textile industry.
PSO2: Understand the impact of textile processes in societal and environmental context and demonstrate the knowledge for sustainable development through teamwork and effective communication for lifelong learning.

IX. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFERENCE BOOKS/WEBSITES

Sr. No.	Author	Title	Publisher
1	Kate Fletcher	Sustainable Fashion and Textiles: Design Journeys	Earthscan
2	Rajeev S. Chitale	Textile Recycling: The Ultimate Guide	CRC Press
3	S. J. Bhuiyan	Circular Economy: A Critical Literature Review	Springer

IX. LEARNING WEBSITES & PORTALS

Sr. No	Link / Portal	Description
1	www.textileblog.com	
2	https://www.thomasnet.com/	

Curriculum Coordinator

Head of the Department

Dean Diploma

BOS VJTI Approval Dt. 23/5/2025

DIPLOMA PROGRAMME	**: DIPLOMA IN TEXTILE ENGINEERING**
PROGRAMME CODE	**: DTE**
SEMESTER	**: SIXTH**
COURSE TITLE	**: ENTREPRENEURSHIP AND STARTUPS**
COURSE CODE	**: 236TE65**

1.TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME												
CL	TL	LL	Self - learning	CR	PAPER HRS	FA-TH (MST)		SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
												FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
-	-	2	1	1.5	-	-		-	-	-	-	50	20	-	-	50	20	100

Total IKS Hrs for Sem.: 0 Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

Course Category: Skill Enhancement Course (SEC): 1

II.RATIONALE

Entrepreneurship and Startup is introduced in this curriculum to develop the entrepreneurship traits among the students before they enter into the professional life. By exposing and interacting with entrepreneurship and startup eco-system, student will develop the entrepreneurial mind set. The innovative thinking with risk taking ability along with other traits are to be inculcated in the students through micro projects and training. This exposure will be instrumental in orienting the students in transforming them to be job generators after completion of Diploma in Engineering.

III.COURSE OUTCOMES (COs)

Students will be able to achieve the following COs on completion of course based learning

- CO1 – Identify one's entrepreneurial traits.
- CO2 – Use information collected from stakeholder for establishing/setting up founding stars up.
- CO3 – Search support system available for starts up.
- CO4 – Prepare project plans to manage the enterprise effectively.

IV. LIST OF TUTORIALS

Sr. No.	Tutorial Title	No. of Hours	Relevant COs
1	Prepare report on Interview of an Entrepreneur	2	CO1
2	*Preparation of report on entrepreneurship as a career	2	CO1
3	*Case study on 'Risks associated with enterprise	2	CO1
4	*Preparation of report on 'Development of new Product'	2	CO1 & CO2
5	*Preparation of Report on 'Process selection' for new startup	2	CO1, CO2 & CO3
6	*Market survey for setting up new Start up'.	2	CO2 & CO3
7	A Case study on 'Technology life cycle' of any successful entrepreneur'.	2	CO3
8	*Preparation of report on 'Information for setting up new startup' from MCED/MSME/KVIC etc.	2	CO3 & CO4
9	*Preparation of report on 'feasibility of any Techno-commercial business".	2	CO4
10	*A case study based on 'Unique selling Proposition (USP) of any successful enterprise.	2	CO4
11	*Prepare project report for starting new startup using 'Atal incubation center (AIC)'.	2	CO1, CO2, CO3 & CO4
12	Preparation of report on 'Brake even point calculation' of any enterprise.	2	CO3 & CO4
13	Collect information about Textile Starts up in India.	2	CO1 & CO2
14	Analyse the factors affecting growth of entrepreneurship in India.	2	CO1
15	Collect information about knitting, Technical Textile and Garment Manufacturing startups.	2	CO1 & CO2

Note:
1) '*' marked Practicals are mandatory.
2) Minimum 80% of the above list of Lab experiments are to be performed

V. LIST OF SELF LEARNING ASSIGNMENT

Sr. No.	Self Learning assignment Title	Relevant COs
1	Prepare a 'Women entrepreneurship business plan' Choose relevant government scheme for the project/service.	CO1
2	Prepare a 'Pitch – desk' for your chart.	CO1
3	Prepare a business plan for a) Market research b) Advertisement Agency c) Placement Agency d) Repair and Maintenance agency e) Tour and Travel agency.	CO1 &CO2
4	Prepare a "Social entrepreneurship business plan for CSR funding.	CO1
5	Prepare a business plan for identified projects by using entrepreneurial eco system for the same (Schemes, incentives, incubators etc.)	CO1, CO2 &CO3
6	Collect information about government Government's initiatives for startup in Textile and Fashion Industry.	CO3
7	Launching of a New product in the market.	CO4
8	Collect information about sources of funding for New Startup.	CO3

Note:

- Above is just a suggestive list of microprojects and assignments; faculty must prepare their own bank of microprojects, assignments, and activities in a similar way.
- The faculty must allocate judicial mix of tasks, considering the weaknesses and / strengths of the student in acquiring the desired skills.
- If a microproject is assigned, it is expected to be completed as a group activity.
- SLA marks shall be awarded as per the continuous assessment record.

VI. ASSESSMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)

- Tutorials
- Midterm Test Exam
- Self-learning
- Term Work
- Seminar/Presentation

Summative Assessment (Assessment of Learning)

- End Term Exam
- Tutorial Performance

VII. SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes * (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO- 1	PSO- 2
CO1	2	2	2	-	-	3	2	-	-
CO2	2	2	2	2	-	3	2	-	-
CO3	2	2	2	2	-	3	2	-	-
CO4	2	2	2	2	-	3	2	-	-

Legends: High:03, Medium:02, Low:01, No Mapping: -
PSO1: Ability to apply knowledge of selecting raw materials, machines and process parameters using standard methods and engineering tools for designing solutions to meet specific needs of the textile industry.
PSO2: Understand the impact of textile processes in societal and environmental context and demonstrate the knowledge for sustainable development through teamwork and effective communication for lifelong learning.

VIII. SUGGESTED LEARNING MATERIALS TEXTBOOKS/REFERENCE BOOKS/WEBSITES

Sr. No	Author	Title	Publisher
1	Dr. Nishith Dubey, Aditya Vyas, Annu Soman, Anupam Singh	Un-boxing Entrepreneurship your self help guide to setup a successful business	Indira Publishing House, ISBN-2023, 987-93-93577-10-2
2	Donald F. Kuratko and Richard M. Hodgetts	Entrepreneurship: Theory, Process, and Practice	Sandra Burke
3	Gujral, Raman	Reading Material of Entrepreneurship Awareness Camp	Entrepreneurship Development Institute of India (EDI), GOI, 2016 Ahmedabad
4	Chitale, A. K.	Product Design and Manufacturing	PHI Learning, New Delhi, 2014; ISBN: 9788120348738
5	Khanka, S.S.	Entrepreneurship and Small Business Management	S. Chand and Sons, New Delhi, ISBN: 978-93-5161-094-6
6	Mukesh Mohan and Nishith Rastogi	Textile and Clothing Management	New Age International (P) Ltd., Publishers

7	Sandra Burke	The Fashion Entrepreneur: Starting Your Own Fashion Business	Bloomsbury Visual Arts
8	David Bornstein and Susan Davis	Social Entrepreneurship: What Everyone Needs to Know	Oxford University Press
9	Eric Ries	The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Business	Currency
10	Alexander Osterwalder and Yves Pigneur	The Business Model Canvas: Designing Business Models That Work	Wiley

X. LEARNING WEBSITES & PORTALS

Sr. No	Link / Portal	Description
1	http://www.mced.nic.in/allproduct.aspx	MCED Product and Plan Details
2	http://niesbud.nic.in/Publication.html	The National Institute for Entrepreneurship and Small Business Development Publications
3	http://niesbud.nic.in/docs/1standardized.pdf	Courses: The National Institute for Entrepreneurship and Small Business Development
4	https://www.nabard.org/content1.aspx?id=23andcatid=23andmid= 530	Government Schemes
5	https://www.nabard.org/Tenders.aspx?cid=501andid=24	NABARD - Information Centre
6	http://www.startupindia.gov.in/pdffile.php?title=Startup%20India%20Action%20Planandtype=Actionandq=Action%20Plan.pdfandcontent_type=Actionandsubmenupoint=action	Start Up India
7	http://www.ediindia.org/institute.html	About - Entrepreneurship Development Institute of India (EDII)
8	http://www.nstedb.com/training/training.htm	NSTEDB - Training

Note:
Teachers are requested to check the creative common license status /financial implications of the suggested online educational resources before use by the students

Curriculum coordinator | Head of the Department | Dean Diploma

BOS VJTI Approval Dt. 23/5/2025

DIPLOMA PROGRAMME	**: DIPLOMA IN TEXTILE ENGINEERING**
PROGRAMME CODE	**: DTE**
SEMESTER	**: SIXTH**
COURSE TITLE	**: INDUSTRY INSTITUTE INTERACTION**
COURSE CODE	**: 236TE66**

I . TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME												
CL	TL	LL	Self - learning	CR	PAPER HRS	FA-TH (MST)	SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
											FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
-	-	2		1	-	-	-	-	-	-	50	20	-	-	-	-	50

Total IKS Hrs for Sem.: 0Hrs

Abbreviations: CL- Classroom Learning, TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination, @$ Internal Online Examination

Course Category: Skill Enhancement Course (SEC): 1

II.RATIONALE

The course aims to bridge the growing gap between academic knowledge and industrial practices. With the rapid technological advancements evolving in the industry, it is essential to provide exposure to the students regarding the dynamic trends, tools, and real-world applications that go beyond the classroom instruction.

Furthermore, the course encourages informed career planning, strengthens industry-academia collaboration, and fosters a culture of lifelong learning and technology-driven thinking.

III. COURSE OUTCOMES (COs)

Students will be able to achieve the following COs on completion of course based learning

CO1 Gain knowledge about real-time industry practices, emerging technologies, and professional challenges beyond the classroom and to keep abreast with industry expectations, work culture, current trends and ethical practices

CO2 Participate in professional networking, critical thinking, and curiosity through visits and knowledge-sharing sessions and encourage to participate in national / state level technical paper, project & quiz competition

IV. COURSE CONTENTS WITH SPECIFICATION TABLE

Unit & Sub-Unit		Topics/Subtopics	Marks	COs
1		**Industry Liaison:** Prepare a comprehensive list of professional and technology from different domains and develop association through various means of • Talks • Guest lectures • Research collaboration • Students project guidance • Seminars • Videos of various technical projects etc.	30	CO1
2		**Industrial Visits /Technical Exhibitions:** Encourage the students to visit wide range of industries technical exhibitions, to keep them abreast of the scenario prevailing in their field of study.	20	CO2

V. LIST OF ASSIGNMENTS

Sr. No.	Assignment Title	Relevant COs
1	Industry Liaison: Students will prepare the report of the activity in a group of 8-10 students.	CO1
2	Industrial Visits /Technical Exhibitions: Students will prepare the report of the activity in a group of 8-10 students.	CO2

VI. ASSESSMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)

- Self-learning
- Term Work
- Seminar/Presentation

Summative Assessment (Assessment of Learning)

- Seminar/Presentation performance assessment

VII. SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Program Outcomes (POs)							Program Specific Outcomes * (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO- 1	PSO- 2
CO1	3	-	2	1	2	-	3	1	2
CO2	3	-	2	1	2	-	3	1	2

Legends:- High:03, Medium:02, Low:01, No Mapping: -

PSO1: Ability to apply knowledge of selecting raw materials, machines and process parameters using standard methods and engineering tools for designing solutions to meet specific needs of the textile industry.

PSO2: Understand the impact of textile processes in societal and environmental context and demonstrate the knowledge for sustainable development through teamwork and effective communication for lifelong learning.

Curriculum coordinator

Head of the Department

Dean Diploma

BOS VJTI Approval Dt. 23/05/2025

DIPLOMA PROGRAMME	**: DIPLOMA IN TEXTILE ENGINEERING**
PROGRAMME CODE	**: DTE**
SEMESTER	**: SIXTH**
COURSE TITLE	**:PROJECT (MAJOR)**
COURSE CODE	**: 236TE67**

1.TEACHING AND EXAMINATION SCHEME

TEACHING SCHEME					EXAMINATION SCHEME												
CL	TL	LL	Self - learning	CR	PAPER HRS	FA-TH (MST)		SA-TH (ESE)		TOTAL		Based on LL & TL Practical				Based on Self-learning		TOTAL MARKS
												FA-PR (CA)		SA-PR (PR/OR)		SLA		
						Max		Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	
-	-	8		4	-	-		-	-	-	-	100	40	100#	40	-	-	200

Total IKS Hrs for Sem.: 0Hrs

Abbreviations: CL- Classroom Learning , TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment, SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, *# Online Examination , @$ Internal Online Examination

Course Category: Discipline Specific Course Core (DSC) : 3, Discipline Specific Elective (DSE) : 0, Value Education Course (VEC) : 1, Intern/Apprentice/Project/Community (INP) : 0, Ability Enhancement Course (AEC) : 2, Skill Enhancement Course (SEC) : 2, Generic Elective (GE) : 0

II.RATIONALE

The students are expected to take up any subject related to textiles and study it in detail and make a presentation on their plan of action. In the next semester provision is made for the students to conduct a study or fabricate the elements if necessary and present them as a continuation of their project.

III.COURSE OUTCOMES (COs)

CO1 Work in a team, plan and coordinate the work

CO2 Analyze the project requirements and review the available literature

CO3 Formulate the methodology to solve the identified problem

CO4 Apply the principles, tools and techniques from the acquired knowledge to solve the problem

CO5 Develop technical writing skills with effective communication

Students will be able to achieve the following COs on completion of course based learning

IV. COURSE CONTENTS WITH SPECIFICATION TABLE

SECTION – I								
Unit & Sub-Unit		Topics/Subtopics	Hours	Marks	COs	R Level	U Level	A Level
1		Perform introductory Task: form groups, identify a topic according to area of interest			CO1	20%	20%	60%
2		Perform Literature Survey : refer various Periodicals, Journals, Books, Internet literature related to project topic			CO2	20%	20%	60%
3		Plan and perform the project work			CO3	20%	20%	60%
4		Test Project work			CO4	20%	20%	60%
5		Test Project work			CO4	20%	20%	60%
6		Prepare a brief report: Each group shall submit one soft and one hard copy of the project report. The project report shall be of 50 to 70 pages. The structure of the report shall be as follows: • Title page • Certificate • Abstract • Acknowledgement • Table of contents • List of tables and figures (if applicable) • Introduction • Objective of project • Methodology used: Design, Drawing Assembly, Testing, Costing			CO5	20%	20%	60%

		• Results • Conclusions • Scope for future work • References • Annexure The format shall be as below: • Font type – Times new roman • Font size: Heading – 14 font (bold), content – 12 font • Alignment – Justified • Line spacing – 1.5 • Header content – left side – name of department, right side – name of project • Footer – Page number (Center) • Numbering of chapters, sections and subsections: Decimal form e.g. Chapter • 2, section 2.1, 2.2, etc and subsection 2.2.1, 2.2.2, etc. • Numbering of tables and figures: Chapter wise e.g. Chapter 2, Table No. 2.1, • 2.2, etc. and Figure No. 2.1, 2.2, etc.						
7		Present project work			CO5	20%	20%	60%
Legends: R- Remember, U – Understand, A – Apply and above levels (Blooms's Revised Taxanomy).								

VI.ASSESSMENTS METHODOLOGIES /TOOLS

Formative assessment (Assessment for Learning)

- Self-learning
- Term Work
- Seminar/Presentation

Summative Assessment (Assessment of Learning)

- Seminar/Presentation performance assessment

VII. SUGGESTED COS-POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes * (PSOs)	
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO- 1	PSO- 2
CO1	2	2	3	0	1	3	3	3	3
CO2	2	3	2	2	1	1	1	2	1
CO3	2	1	3	2	1	1	1	3	2
CO4	3	1	2	3	3	2	2	3	1
CO5	1	0	0	0	0	3	2	1	3

Legends : High:03, Medium:02, Low:01, No Mapping: -
PSO1: Ability to apply knowledge of selecting raw materials, machines and process parameters using standard methods and engineering tools for designing solutions to meet specific needs of the textile industry.
PSO2: Understand the impact of textile processes in societal and environmental context and demonstrate the knowledge for sustainable development through teamwork and effective communication for lifelong learning.

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