DKTE Society's

TEXTILE & ENGINEERING INSTITUTE

Rajwada, Ichalkaranji 416115 (An Autonomous Institute)

DEPARTMENT: TEXTILE.

CURRICULUM

B.Tech. Textile Plant Engineering Program

First Year

With Effect From 2020-2021



Promoting Excellence in Teaching Learning & Research

			Semester					
	Course Code	Name of the Course	Group					
Sr. No.				Theory Hrs/ Week	Tutorial/ Drawing Hrs/ Week	Practical Hrs/ Week	Total	Credits
1	TPL161	Textile Mathematics - I	В	3			3	3
2	TPL162	Applied Mechanics	C	3			3	3
3	TPL163	Electrical Technology	C	3			3	3
4	TPL164	Textile Fibres	D	3			3	3
5	TPL165	Yarn Manufacturing Machinery - I	D	3			3	3
6	TPP166	Electrical Technology Lab	С			2	2	1
7	TPP167	Professional Communication Lab	А	1		2	3	2
8	TPP168	Yarn Manufacturing Machinery - I Lab	D			2	2	1
		Total		16	0	6	22	19

First Year UG Program in B. Tech. Textile Plant Engineering Semester-I

Group Details

- A: Humanities, Social Science & Management
- B: Basic Science
- C: Engineering Science
- D: Professional Core Courses
- E: Professional Electives
- F: Open Elective
- G: Project / Seminar / Internship
- H: Mandatory non-Credit Courses

First Year B. Tech. Semester – I TPL161: TEXTILE MATHEMATICS- I

Teaching Scheme			Evaluation Scheme		
Lectures	3Hrs. / Week		SE-I	25	
Total Credits	3		SE-II 25		
			SEE	50	
			Total	100	

Course O	bjectives
1.	Introduce students with normal form, echelon form and rank of matrix. Prepare
	them to solve the problems of finding rank and solve system of equations.
2.	Introduce students with the theory of finding derivative numerically and fitting
	curve to given data. Prepare them to solve problems of numerical differentiation and
	curve fitting.
3.	Introduce students with basic concept of statistical data, collection and types of data,
	classification, graphical representation, frequency distribution with construction,
	central tendency and dispersion of data, measures of central tendency and
	dispersion. Prepare them to solve problem of these concepts with interpretation.
4.	Introduce students with concept of skewness and kurtosis, measures of skewness
	and kurtosis. Prepare them to solve and interpret problems of skewness.

Course Outcomes

At the end of the course students have understood

1 10 0110 0110	
1.	The theory of normal form, echelon form and rank of matrix. Also, they can solve
	problems of finding rank and solve system of equations.
2.	The theory finding derivative numerically and fitting curve to given data. Also, they
	are able to solve problems related to numerical differentiation and curve fitting.
3.	Basic concept of statistical data, collection and types of data, classification, graphical
	representation, frequency distribution with construction, central tendency and
	dispersion of data, measures of central tendency and dispersion. Also, they are able to
	analyse and interpret given statistical data using these concepts.
4.	Concept of skewness and kurtosis, measures of skewness and kurtosis. Also, they are
	able to solve and interpret problems of skewness.

	Course Contents			
Unit 1.	Matrix: Rank of matrix (Normal form of matrix, Echelon form of Matrix)			
	Solution of simultaneous linear equations (Homogeneous & Non-			
	Homogeneous) Characteristic equation, eigen values, eigen vectors. Caley			
	Hamilton's theorem.			
Unit 2.	Successive Differentiation & Partial Differentiation: Introduction,	7		
	standard results, Leibnitz rule. Introduction of p. d., total differentiation,			

	Euler's theorem on homogeneous function. Jacobean (J.J'=1) only, Errors	
	& approximation.	
Unit 3.	Numerical Differentiation & curve fitting: Newton's forward & backward	6
	formulae, Sterling's formula. Newton's divided difference formula.	
	Fitting of curves: y=a+bx, y=a+bx+cx2, y=a.x^b by least square method	
Unit 4.	Introduction of Statistics: Definitions of Population, Variable, Attribute,	7
	Census Survey, Sample Survey, Random sample. Raw statistical data,	
	collection, classification, Frequency distribution, class limits & boundary,	
	class width, mid-point. Histogram, Frequency polygon, Frequency curve.	
	Measures of central tendency: Arithmetic Mean (A.M.), Median, Mode,	
	Combined Mean & Computation Partition values : Quartiles deciles and	
	percentiles & Computation	
Unit 5.	Measures of dispersion: Range, Quartile deviation, Mean deviation,	7
	Standard deviation as Absolute measures of dispersion, Coefficient of	
	range, quartile deviation, mean deviation, coefficient of variation as	
	Relative measures of dispersion, consistency of data & computation	
Unit 6.	Measures of Skewness& kurtosis: Skewness, types, Karl Pearson's &	5
	Bow ley's coefficient of skewness& Computation. Kurtosis definition and	
	types only. (No Examples of Kurtosis)	

Refe	Reference Books		
1	A textbook of applied mathematics VolI & II by P.N. & J.N. Wartikar		
2	Higher engineering mathematics by B.S. Grewal		
3	A textbook of applied mathematics by Bali, Saxena&Iyangar.		
4	Mathematical Statistics by J.E. Fruend.		
5	Probability & Statistics for engineers by Johnson.		
6	Statistical methods by Kumbhojkar		

First Year B. Tech. Semester – I TPL162: APPLIED MECHANICS

Teaching Scheme		Evaluation	n Scheme
Lectures	3 Hrs. /Week	SE-I	25
Total Credits 3		SE-II	25
		SEE	50
		Total	100

Course O	Course Objectives				
1.	To understand the concept of forces and various laws related to force with basic				
	principles, theorems and concepts of mechanics.				
2.	To understand the concepts like equilibrium, support reactions, friction, moment of				
	inertia and use of simple machines				
3.	To study and analyse the effect of various types of forces on the bodies in static				
	and dynamic conditions.				
4.	To interpret the concept of transmission of motion and power in various machines				
	by using various drives and bearings used in textile machines				

Course Outcomes					
At the end	At the end of the course students will be able to				
1.	Understand the concept of forces and various laws related to force with basic				
	principles, theorems and concepts of mechanics.				
2.	Understand the concepts like equilibrium, support reactions, friction, moment of				
	inertia and use of simple machines.				
3.	Analyse the effect of various types of forces on the bodies in static and dynamic				
	conditions.				
4.	Interpret the concept of transmission of motion and power in various machines by				
	using various drives and bearings used in textile machines				

	Course Contents	Hrs.				
Unit 1.	Fundamentals of statics					
	Statics, dynamics, Fundamental units of measurements, Metric system of					
	units, SI. System, Scalar and Vector quantities. Force, system of forces,					
	Resultant force and equilibrant, principle of transmissibility of force,					
	moment of force. Couple, Law of parallelogram of forces, Varignon's					
	theorem, Composition and resolution of Coplanar concurrent and non-					
	concurrent forces.					
Unit 2.	Equilibrium	7				
	Equilibrium of Coplanar forces, Conditions of equilibrium, free body					
	diagram, Lami's theorem.					
	Friction: Introduction to friction, types of friction, Laws of friction. Cone					

	of Friction.	
	Beams: Types of beams, Types of Loads, Types of supports, Analysis of	
	Simply supported beams.	
Unit 3.	Moment of Inertia	7
	Centroid and Centre of gravity, Centroid of composite areas, Radius of	
	gyration, parallel axis theorem, perpendicular axis theorem, Moment of	
	inertia of composite sections.	
Unit 4.	Lifting Machines	6
	Mechanical advantage, velocity ratio, efficiency, law of machine, effort	
	lost in friction, load lost in friction, Study and numerical examples on	
	simple machines- Simple screw jack, Simple axle and wheel, differential	
	axle and wheel, worm and worm wheel.	
Unit 5.	Kinematics and Kinetics	8
	Kinematics of Linear motion: Equations of linear motion with constant	
	and variable acceleration, motion under gravity.	
	Kinematics of Angular motion: Relation between angular motion &	
	linear motion, Equations of angular motion, Centrifugal & centripetal	
	forces, Motion along a curved path, Banking of roads.	
	Kinetics: Newton's laws of motion, Mass moment of inertia,	
	D'Alemberts principle, work, power, energy, impulse, Work- Energy	
	Principle, Impulse- Momentum Principle, Principle of conservation of	
	energy.	
Unit 6.	Transmission of motion and power	6
	Belt, rope, chain and gear drives, P.I.V. drives, Type of gears and gear	
	drives, Gear trains, velocity ratio, advantages of gear drives, uses in	
	textile machines, Concept of epicyclic gearing. Types of bearing and their	
	applications (Only theory, no numerical examples on this topic)	

Refe	Reference Books		
1	Engineering Mechanics by R. K. Bansal and Sanjay Bansal, Laxmi Publications.		
2	Applied Mechanics by R.S. Khurmi, S. Chand Publications.		
3	Engineering Mechanics by S. S. Bhavikatti, New Age International Pvt. Ltd.		
4	Engineering Mechanics by S. Ramamrutham, DhanpatRai and Sons.		
5	Fundamentals of Engineering Mechanics by S. Rajasekaran, Sankarasubramanian, Vikas		
	Publishing House.		
6	Applied Mechanics by S.N. Saluja, SatyaPrakashan, New Delhi		
7	Engineering Mechanics by S. B. Junnarkar, Charotar Publishing House Pvt. Ltd.		
8	Vector Mechanics for Engineers Vol. I & II, by Beer & Jonhstan, Tata Mc-Graw Hill		
	Publication		

First Year B. Tech. Semester – I TPL163: ELECTRICAL TECHNOLOGY

Teaching Scheme	
Lectures	3 Hrs. /Week
Total Credits	3

Evaluation Scheme	
SE-I	25
SE-II	25
SEE	50
Total	100

Course Objectives		
1.	To understand basic concepts involved in electrical & magnetic circuits.	
2.	To understand concepts of elements & parameters in single phase and three phase	
	AC circuits. Three phase Induction motor .	
3.	To understand working and importance of electrical transformer.	
4.	To study different types of electrical accessories, electric earthling & Lamps.	
	Energy auditing and Power quality.	

Course Outcomes		
At the end of the course students will be able to		
1.	Apply the fundamental laws and principles to solve the electrical & magnetic circuits.	
2.	Analyse the behaviour of any element with respect to AC supply	
3.	Analyse the characteristics behaviour of electrical transformer.	
4.	Apply the knowledge of switchgear and lamps in electrical installation.	

	Course Contents	Hrs.
Unit 1.	D. C. Circuit	8
	Basic electrical quantities, Concept of E.M.F, Potential Difference,	
	current, Resistance, Ohm's Law, Kirchhoff's laws, mesh and node	
	analysis, Energy Bill calculation. Numericals	
Unit 2.	Magnetic Circuits	6
	Flux, flux density, Reluctance, field intensity, permeability, mmf,	
	comparison of Electric and Magnetic circuit, leakage and fringing, B-H	
	curve, series magnetic circuits. Numericals.	
Unit 3.	Single Phase A.C. Circuits	8
	Faraday's Laws, Lenz's Law, types of emfs, generation of sinusoidal	
	voltage, R.M.S. & Average value, form factor, peak factor, phasor	
	representation of A.C. quantities, impedance, R-L, R-C, R-L-C series	
	circuits, powers, power factor and its improvement by capacitor method.	
	Numericals	
Unit 4.	Three Phase A.C. Circuits	8
	Introduction to three phase supply and its advantages, Generation of three	
	phase A.C. voltage, balanced system, relation between line and phase	

	quantities in star and delta. Numericals. Three Phase Induction Motor	
	Working Principle, Constructional Details, Types, Rotating Magnetic	
	Field Theory. Speed Control Methods, Necessity of starters, Types of	
	Starters, modern starter variable Frequency Drive (VFD), application in	
	Textile Industry	
Unit 5.	Single Phase Transformer	6
	Construction, operating principle, Types, EMF equation, Concept of Ideal	
	Transformer, Transformation Ratio, operation on no load and with load,	
	losses, efficiency, voltage regulation, testing, applications. Numericals.	
Unit 6.	Electrical Switchgear and Lamps , Power Quality , Energy Audit	6
	Necessity of Earthing, Earthing methods, Fuse (rewireble and HRC),	
	MCB, Fluorescent tube, CFL, Mercury vapour lamp, LED lamp, single	
	line diagram of electrical system. Introduction of energy audit, power	
	quality, Harmonics concept of energy efficient lighting system & motors	
	[EEM]	

Refe	Reference Books	
1	Elements of electrical Engineering by U.A. Bakshi	
2	Electrical Technology by U.A. Bakshi	
3	Basic Electrical Engineering by B. H. Deshmukh.	
4	A text book in electrical technology by B. L. Thareja	
5	Fundamentals of Electrical Engineering by Ashfaq Husain	
6	Elements of electrical Engineering by U.A. Bakshi	

First Year B. Tech. Semester – I TPL164: TEXTILE FIBRES

Teaching Scheme	
Lectures	3 Hrs. / Week
Total Credits	3

Evaluation Scheme	
SE-I	25
SE-II	25
SEE	50
Total	100

Course Objectives		
1.	To explain the basics of textile fibres	
2.	To describe the morphological and chemical structure of natural fibres	
3.	To describe the manufacturing processes of manmade fibres	
4.	To explain the properties of natural and manmade fibres	

Course Outcomes		
At the end of the course, students will be able to		
1.	Explain the basics of textile fibres	
2.	Describe the morphological and chemical structure of natural fibres	
3.	Demonstrate the manufacturing processes of manmade fibres	
4.	Enunciate properties of natural and manmade fibres	

Unit	Course Contents		Hrs.	
	Intro	luction		
	a.	Concepts of: Fibre, Yarn, Fabric, Staple fibre, Filament,		
		Regenerated fibre, Degree of polymerization, Crystallinity,		
		Orientation.		
Unit 1.	b.	Classification of fibres.	5	
	с.	Advantages and disadvantages of natural & manmade fibres.		
	d.	Characteristics of fibre forming polymer.		
	e.	The requirement of fibre formation.		
	f.	Introduction to Textile Value Chain.		
	Veget	able Fibres		
	a.	Cotton Fibre: Cultivation and harvesting, Development of fibre		
		in seed, Morphological structure, Properties and applications of		
Unit 2.		Cotton fibre.	7	
	b.	Bast Fibres: Retting and extraction process of Bast fibres,		
		Properties and applications of Jute fibres.		
	с.	Introduction to other vegetable fibres		
	Anim	al Fibres		
Unit 3.	a.	Wool: Types and grading of wool, Morphological structure,	7	
		Properties and applications.		

	b. Silk: Types of silk, Production of silk, Morphological structure,		
	Properties and applications.		
	Manmade Fibre Formation Technologies		
	a. Melt Spinning		
Unit 1	b. Dry Spinning	1	
Umt 4 .	c. Wet Spinning	-	
	d. Comparison between different man-made fibre formation		
	technologies.		
Manmade Fibres			
	a. Polyamide Fibres (Nylon 6 & Nylon 66): Manufacturing		
	process, Properties and applications.		
	b. Polyester (Polyethylene Terephthalate): Manufacturing process,		
	Properties and applications.		
Unit 5.	c. Polyolefin Fibres (Polypropylene): Manufacturing process,	12	
	Properties and applications.		
	d. Polyacrylonitrile Fibre: Manufacturing process, Properties and		
	applications.		
	e. Polyurethane Fibres: Extensibility and recovery mechanism,		
	Manufacturing process, Properties and applications		
	Regenerated Fibres		
Unit 6	a. Viscose Rayon: Manufacturing process, Properties and	1	
Unit 0.	applications.	-	
	b. Introduction to other regenerated fibres		

Refe	Reference Books		
1	ACIMIT – Italy, Reference Book of Textile Technology - Man-made Fibres (2011).		
2	J. Gordon Cook, Handbook of Textile Fibres. Volume 1 Natural Fibres, Woodhead		
	Publishing Series in Textiles ISBN:978-1-85573-484-5 (1984).		
3	J. Gordon Cook, Handbook of Textile Fibres. Volume 2 Man-Made Fibres, Woodhead		
	Publishing Series in Textiles, ISBN: 978-1-85573-485-2 (1984).		
4	Murthy, H. V. Sreenivasa, Introduction to Textile Fibres, Woodhead Publishing India		
	in Textiles, ISBN:978-93-85059-57-5 (1984).		
5	S.P. Mishra, A Textbook of Fibre Science and Technology, New Age International (P.)		
	Limited, ISBN: 9788122412505 (2000).		
6	R. W. Moncrieff, Man-made Fibres, Heywood Books, Open Library-OL5656433M		
	(1966).		
7	V. R. Gowariker, Polymer Science, New Age International Publishers; Third edition,		
	ISBN: 9387788644, (1 January 2019).		

First Year B. Tech. Semester – I TPL165: YARN MANUFACTURING MACHINERY- I

Teaching Scheme		
Lectures	3 Hrs. / Week	
Total Credits	3	

Evaluation Scheme		
SE-I	25	
SE-II	25	
SEE	50	
Total	100	

Course Objectives		
1.	To explain basic fibre properties and staple yarn spinning processes.	
2.	To explain basics and conversions related to yarn numbering system.	
3.	To explain the process and methods used for cotton cultivation and harvesting.	
4.	To explain cotton Ginning technology and Techniques.	

Course Outcomes		
At the end of the course students will be able to		
1.	Understand fibre properties, operations and mechanisms of staple yarn spinning.	
2.	Understand the yarn numbering system and related calculations.	
3.	Understand the process and methods used for cotton cultivation and harvesting.	
4.	Understand cotton Ginning technology and Techniques.	

	Course Contents	Hrs.	
Unit 1.	Definition of terms – Textiles, Fibres, Staple fibre, Filament, Staple yarn,		
	Filament yarn.		
	Classification of yarns.		
	Essential and desirable properties of fibres and their impact on staple fibre		
	spinning		
	Process flow chart for Ring, Rotor and Air-jet yarn manufacturing.		
	Objects of each machine in spinning process.		
Unit 2.	Yarn numbering systems – Introduction, Importance, Direct and Indirect		
	yarn numbering systems. Related calculations.		
	Resultant yarn count calculations.		
Unit 3.	Indian Cotton Cultivation. Factors affecting the cotton cultivation.6 Hr		
	Spinnability of Varieties of different cottons.		
	Cotton Harvesting - Factors affecting the cotton harvesting, Types of		
	harvesting, Process of Defoliation.		
Unit 4.	Pre and post Ginning Process -Objects, machines used and their	4 Hrs.	
	importance		
Unit 5.	Introduction of ginning process.	5 Hrs.	

	Construction and working of different ginning machines	
Unit 6.	Factors affecting ginning performance –	8 Hrs
	Machine Factors, Agricultural Factors and Material Factors.	
	Effect of ginning on fiber and yarn properties	
	Pressing and bailing of cotton – Importance, Method and characteristics	
	of Indian bales	

Refe	Reference Books			
1	The Textile Institute Publication - Manual of Textile Technology - Short Staple Spinning			
	Series by W. Klein			
2	The Characteristics of Raw Cotton' by P. Lord. The Textile Institute Publication, Manual			
	of Cotton Spinning Vol.II, Part-I.			
3	'Opening and Cleaning' by Shirley. The Textile Institute Publication, Manual of Cotton			
	Spinning Vol. II, Part-II.			
4	Opening Cleaning and Picking' by Dr.Zoltan S. Szaloki, Institute of Textile Technology,			
	Virginia.			
5	'Cotton Ginning' Textile Progress, The Textile Institute Publication.			
6	Blow room and Carding- Training Program conducted by NCUTE, IIT, Delhi.			
7	'Cotton Production and Blow Room' By Dr. R. N. Narkhedkar, Research India			
	Publication, Delhi.			
8	Essential calculations of practical cotton spinning by T.K. Pattabhiraman			
9	The Textile Institute Publication - Manual of Textile Technology - Short Staple Spinning			
	Series by W. Klein			

First Year B. Tech. Semester – I TPP166: ELECTRICAL TECHNOLOGY LAB

Teaching Scheme		
Practical	2 Hrs. /Week	
Total Credits	1	

Evaluation Scheme		
CIE	50	
Total	50	

List of Experiments		
1.	General Introduction to Electrical Engineering laboratory.	
2.	Verification of Ohm's Laws.	
3.	Verification of Kirchhoff' Current Law.	
4.	Verification of Kirchhoff' Voltage Law.	
5.	Determination of Power factor in ac circuit.	
6.	Determination of Resistance & Inductance of a coil.	
7.	Study of Phasor Relationship in R-L-C series circuit.	
8.	Verification of phase and line parameters in three phase system.	
9.	Determination of Efficiency and Regulation of Single Phase Transformer.	
10.	Study of different types of Earthing.	
11.	Study of different types of Protective devices.	
12.	Study of different types of lamps.	

First Year B. Tech. Semester – I TPP167: PROFESSIONAL COMMUNICATION LAB

Teaching Scheme		Evaluation Scheme	
Lectures	1 Hrs. / Week	CIE	50
Practical	2 Hrs. / Week	Total	50
Total Credits	2		

Course Objectives		
1.	To help students to understand basic concepts of communication and life skills.	
2.	To help them communicate effectively and to present their ideas in a rational and	
	logical manner.	
3.	To apply effective writing skills widely practiced everywhere.	
4.	To make them aware of professional skills along with grammar and vocabulary.	

Course Outcomes		
At the end of the course students will be able to		
1.	Understand the importance of communication and life skills which is beneficial for	
	them throughout life.	
2.	To exhibit oratorical skills by giving oral presentations.	
3.	Demonstrate writing skills through letters, emails and job applications.	
4.	Make use of English language with grammatical accuracy and apply professional	
	skills.	

Unit	Course Contents	Hrs.
TT A A		
Unit 1.	Understanding Communication:	2
	Meaning of communication, Process of communication – idea or source,	
	sender, encoding process, message, medium or channel, noise, receiver,	
	decoding process, feedback,-Barriers to Communication - Physical	
	barriers - mechanical barriers -socio-cultural - psychological barriers -	
	linguistic and semantics barriers, Forms of Communication – Formal and	
	informal communication-Oral and written communication	
	upward, downward, horizontal, grapevine-Verbal Communication	
	Non Verbal Communication – appearance – gestures – facial expressions-	
	postures – kinesics – eye contact – silence – haptic – proxemics –	
	paralinguistic	
Unit 2.	Fundamentals of English:	2
	Tenses-vocabulary - Parts of speech – Basic sentences.	
Unit 3.	Business Correspondence	2
	Simple application letter drafting-	
	Application and resume writingEmail writing.	

Unit 4.	Oratorical Efficiency	3
	The phonemic alphabet in English: vowel	
	sounds – short vowels – long vowels – diphthongs and	
	tripthongs -Consonantal sounds	
	Extempore - Elocution – Debate –	
	-Presentation techniques.	
Unit 5.	Life Skills:	2
	Developing Positive attitude -Decision Making Skills - Leadership Skills	
	- Emotional Intelligence - Time Management - Team Work.	
Unit 6.	Professional skills	2
	Group discussion: meaning -types- rules- judging criteria -Interview	
	Techniques: types- rules- judging criteria.	

Reference Books			
1	Soft Skills for Managers by Dr. T. KalyanaChakravarthi, Dr. T. LathaChakravarthi,		
	Biztantra.		
2	Communication skills for engineers by Sunita Mishra.		
3	Soft Skills for every one by Jeff Butterfield, Cengage		
4	Body Language by Allen Pease		
5	Speaking Accurately by K.C. Nambiar, Cambridge University Press New Delhi.		
6	Speaking Effectively by Jeremy Comfort, Pamela Rogerson, and Cambridge		

List of Experiments		
1.	Understanding Self or About myself	
2.	Grammatical activities	
3.	Simple application letter	
4.	Job application and resume writing	
5.	Extempore	
6.	Vocabulary building	
7.	E mail writing	
8.	Elocution	
9.	Debate	
10.	Power point presentation on given topic	
11.	Group Discussion	
12.	Mock interview	

Submission -

Completed Tutorial and assignment books SCHEME OF ASSESSMENT:

TUTORIAL BOOK	30 MARKS (Attendance, writing, performance)
ASSIGNMENT BOOK	10 MARKS.
ORAL	10 MARKS.

First Year B. Tech. Semester – I TPP168: YARN MANUFACTURING MACHINERY - I LAB

Teaching Scheme		
Practical	2 Hrs. / Week	
Total Credits	1	

Evaluation Scheme		
CIE	50	
Total	50	

List of Experiments		
1.	Layout of spinning work shop.	
2.	Study of different types of drives and calculations.	
3.	Study of various types of bearings used on spinning machines.	
4.	Process Flow chart for carded and combed yarn manufacturing	
5.	Process Flow chart for Air jet, Rotor yarn manufacturing	
6.	Testing of hank produced from Preparatory Machines.	
7.	Testing of hank produced from Spinning Machines.	
8.	Study of ginning machine: Construction, Working	
9.	Calculation of machine cleaning efficiency.	
10.	Study of Blow-room line - Flow chart - Machine positioning in Blow-room.	
11.	Mill visit I - (Collection of different types of yarns)	
12.	Mill visit II	

First Year UG Program in B. Tech. Textile Plant Engineering						
Semester-II						

					Teaching	Scheme		
Sr. No.	Course Code	Name of the Course	Group	Theory Hrs/ Week	Tutorial Hrs/ Week	Practical Hrs/ Week	Total	Credits
1	TPL171	Textile Mathematics - II	В	3			3	3
2	TPL172	Applied Physics	В	3			3	3
3	TPL173	Engineering Graphics	C	2			2	2
4	TPL174	Fabric Manufacturing Machinery - I	D	3			3	3
5	TPL175	Manufacturing Processes - I	В	3			3	3
6	TPP176	Engineering Graphics Lab	C			2	2	1
7	TPP177	Fabric Manufacturing Machinery - I Lab	D			2	2	1
8	TPP178	Manufacturing Processes - I Lab	В			2	2	1
9	TPP179	Fundamentals of Computer and Programming Lab	В			2	2	1
10		Democracy, Election and Good Governance *	Н					NP/NF
		Total		14		8	22	18

Group Details

- A: Humanities, Social Science & Management
- B: Basic Science
- C: Engineering Science
- D: Professional Core Courses
- E: Professional Electives
- F: Open Elective
- G: Project / Seminar / Internship
- H: Mandatory non-Credit Courses

First Year B. Tech. Semester – II TPL171: TEXTILE MATHEMATICS- II

Teaching Scheme		Evaluation Scheme		
Lectures	3Hrs. / Week	SE-I	25	
Total Credits	3	SE-II 25		
		SEE	50	
		Total	100	

Course O	Course Objectives					
1.	Prepare students so that they can understand mathematical rules used in tracing					
	cartesian and polar curves.					
2.	Prepare students with the definition, methods related to reduction formulae, special					
	functions, multiple integrals and its applications					
3.	Prepare students with statistical methods so that they can understand analysis of					
	bivariate data, correlation and regression.					
4.	Prepare students to understand probability, random variable and probability					
	distributions. Also, to solve textile engineering problems using probability					
	distributions.					

Course O	Course Outcomes						
At the end	At the end of the course students have understood						
1.	Rules of tracing cartesian and polar curves. Also, they are able for trace curves.						
2.	the theory, definition and properties of reduction formulae, special functions,						
	multiple integrals and its applications. Also, they are able to use them to solve the						
	problems of area, mass of lamina and volume.						
3. the bivariate data, definition of correlation and properties of correlation coef							
	concept of regression, types and regression equations. Also, they are able to find						
	coefficient of correlation, equations of regression with interpretation.						
4.	the concept of random variable with type and probability distribution of random						
	variable with types. Also, they are able to solve textile problems using Binomial,						
	Poisson and Normal probability distributions						

	Course Contents	Hrs.
Unit 1.	Curve Tracing: Rules & examples of curve tracing in Cartesian and Polar	5
	Equations only	
Unit 2.	Integral Calculus: Reduction formulae of sine and cosine functions,	8
	Gamma function, Beta Function,	
	Multiple integrals: Introduction, solution, change of order & Change of	
	variables method.	
Unit 3.	Applications of integration: Area, Mass of lamina using double integrals	6
	only. Volume using triple integral only	

Unit 4.	Bivariate data: Correlation: Definition, types, coefficient of correlation, properties & interpretation. Rank correlation coefficient & computation and interpretation. Regression: Regression concept and types. Lines of regression X on Y & Y on X, regression coefficients with properties & computation.	7
Unit 5.	Probability distribution: Introduction of probability and its basic laws. Random variable: Definition, types. Introduction of probability distribution, types of probability distribution, pmf & pdf, expectation of random variable. MGF of random variable. Standard discrete probability distributions: Binomial probability distribution: Definition, properties, fitting & examples. Poisson probability distribution: Definition, properties, fitting & examples	7
Unit 6.	Standard continuous probability distributions: Normal probability distribution: Definition, properties, standard normal distribution & examples. Chi-square probability distribution (χ 2): Definition & properties only. t-probability distribution: Definition & properties only. F-probability distribution: Definition & properties only. Introduction of statistical table for Z, t, χ 2, & F.	6

Refe	rence Books
1	A textbook of applied mathematics VolI & II by P.N. & J.N. Wartikar
2	Higher engineering mathematics by B.S. Grewal
3	A textbook of applied mathematics by Bali, Saxena & Iyangar.
4	Mathematical Statistics by J.E. Fruend.
5	Probability & Statistics for engineers by Johnson.
6	Statistical methods by Kumbhojkar

First Year B. Tech. Semester – II TPL172: APPLIED PHYSICS

Teaching Scheme			Evaluation Scheme		
Lectures	3 Hrs. / Week		SE-I	25	
Total Credits	3		SE-II 25		
			SEE	50	
			Total	100	

Course Objectives						
1.	To understand significance of basic concepts of physics involved in textiles					
2.	. To discuss the different factors from physics affecting yarn and fabric properties					
3.	To explain the different principles from physics involved in textiles.					
4.	To explain the different methods of measurement and calculate the different					
	quantities of physics involved in textiles.					

Course O	Course Outcomes					
At the end	At the end of the course students will be able to					
1.	Understand significance of basic concepts of physics involved in textiles					
2.	Discuss the different factors from physics affecting yarn and fabric properties					
3.	Explain the different principles from physics involved in textiles.					
4.	Explain the different methods of measurement and calculate the different quantities					
	of physics involved in textiles					

	Course Contents	Hrs.					
Unit 1.	Elasticity:	7					
	Stress, strain, Hooke's Law of elasticity, Breaking stress, Working stress,						
	Factor of safety, Resilience. Some peculiar traits and Factors affecting						
	elasticity. Young's modulus, bulk Modulus and Modulus of rigidity.						
	Relation between Y, η and K. Poission's ratio, relation between K, η and						
	Poission's ratio. Twisting couple on a cylinder (for wire). Torsional						
	rigidity.						
Unit 2.	Viscosity:	6					
	Newton's Law of viscosity. Streamline & Turbulent flow, Critical						
	velocity, Significance of Reynold's number. Stokes law. Terminal velocity						
	and its expression. Poiseuille"s equation for flow of a liquid through a						
	horizontal capillary tube. Experimental determination of η for a liquid by						
	Poiseuille's method, Ostawald viscometer Applications of viscosity.						
Unit 3.	Friction and Surface Tension:	6					
	Types of friction, Laws of friction, Angle of friction, acceleration down an						
	inclined plane. Rope brake, Proof of $T_2/T_1 = e^{\mu \Theta}$.						
	Molecular theory of surface tension. Surface energy, Angle of contact,						

	capillary rise. Excess pressure inside a liquid drop, Soap bubble and inside a	
	curved membrane of any shape. Applications of surface tension.	
Unit 4.	Optics:	
	Laws of refraction, refractive index, total internal reflection. Magnifying	7
	Power and Resolving power. Construction & working of electron	
	microscope. Polarization of light, Double refraction, Nicol prism, Quarter	
	wave and Half wave plate. Production and detection of circularly and	
	Elliptically polarized light.	
Unit 5.	Crystalline solids and characterization by X-rays	
	Production of x-rays by modern Coolidge tube, Properties and	7
	Applications of X-rays. X-ray spectrum. Seven crystal systems, miller	
	Indices. Bragg's law and Bragg's x-ray spectrometer.	
Unit 6.	Laser and Photoelectric effect:	6
	Laser, Characteristics and Applications of Laser. Spontaneous, Stimulated	
	emission and Ruby Laser. Photoelectric effect, Einstein's equation of	
	photoelectric equation. Factors affecting the photoelectric effect. Study	
	of various photocells. Use of photo sensors.	

Refe	Reference Books		
1	Elements of Properties of Matter by D.S. Mathur		
2	Engineering Physics by B.L. Theraja		
3	Engineering Physics by R.K. Gour& Gupta		
4	Physics for Engineers by M.R. Srinivasan		
5	Text Book of Optics by Brijlal & Subramanyam		
6	Optics by A.K. Ghatak		

First Year B. Tech. Semester – II TPL173: ENGINEERING GRAPHICS

Teaching Scheme			Evaluation Scheme		
Lectures	2 Hrs. /Week		SE-I	25	
Total Credits2			SE-II	25	
			SEE	50	
			Total	100	

Course Objectives				
1.	To understand procedure for converting a pictorial view into orthographic view.			
2.	To understand procedure for converting an orthographic view in to isometric view.			
3.	To understand procedure for drawing Development and anti-development of solids such as cone, cylinder, prism and pyramid.			
4.	To study IS convections for various materials and mechanical elements, free hand sketches of various mechanisms used in textile machines. To know the use of Auto-CAD Commands.			

Course Outcomes					
At the end	At the end of the course students will be able to				
1.	Draw orthographic views from a given pictorial view.				
2.	Draw isometric view from given orthographic views.				
3.	Draw Development and anti-development of solids such as cone, cylinder, prism and				
	pyramid.				
4.	Draw IS convections for various materials and mechanical elements, free hand				
	sketches of various mechanisms used in textile machines. To write Commands for				
	various entities in Auto-CAD.				

	Course Contents	Hrs.				
Unit 1.	Introduction & use of instruments:					
	Line, Lettering, Conventions of section lines, I.S. conventions of machine	3				
	parts like knurling, square end of shaft, bearing, springs, external &					
	internal thread.					
Unit 2.	Introduction to Projection of Points, Lines, Planes, Solids and Section					
	of Solids					
Unit 3.	Orthographic Projections and Sectional Orthographic views:					
	General principles, First angle method, Third angle method,					
	Dimensioning, Cutting plane, Types of sections, drawing sectional views	5				
	of machine components.					
Unit 4.	Isometric Projections:					
	Principle, Isometric scale, Isometric views, Making Isometric drawings of					
	simple objects from orthographic views.					

Unit 5.	Development of Surfaces:				
	Introduction to solids (Types of solids only), Development of lateral				
	surfaces of cubes, prisms, pyramids, cylinders & cones.	7			
Unit 6.	Free hand sketches & Introduction to Auto- CAD				
	Making free hand sketches of various textile machine parts &	3			
	mechanisms used in spinning, weaving, processing, garments.				
	Commands for drawing lines, circles, polygons, ellipse etc.				

Refe	Reference Books		
1	Engineering Drawing by N. D. Bhatt & V. M. Panchal.		
2	Engineering Drawing by Venugopal.		
3	Machine Drawing by N. D. Bhatt & V. M. Panchal.		
4	Machine Drawing by K. L. Narayana, Kannaiah P., K. Venkata Reddy.		
5	Principles of Weaving by Marks & Robinson.		
6	Engineering Graphics by H. G. Phakatkar		

First Year B. Tech. Semester – II TPL174: FABRIC MANUFACTURING MACHINERY- I

Teaching Scheme		Evaluation Scheme	
Lectures	3 Hrs. / Week	SE-I	25
Total Credits 3		SE-II	25
		SEE	50
		Total	100

Course Objectives					
1.	To describe the Textile Industry in India and explain the object of all weaving				
	preparatory processes				
2.	To explain various motions of a plain loom, production and fabric weight				
	calculations				
3.	To explain various motions on loom like dobby, drop box and jacquard.				
4.	To explain method of fabric analysis and also to describe the identification and				
	construction of basic weaves and it's derivatives as well as the towel weaves				

Course O	Course Outcomes				
At the end	At the end of the course students will be able to				
1.	Describe the Textile Industry in India and explain the object of all weaving				
	preparatory processes.				
2.	Explain various motions of a plain loom, production and fabric weight				
	calculations.				
3.	Explain various motions on loom like dobby, drop box and jacquard.				
4.	Explain method of fabric analysis and also to describe the identification and				
	construction of basic weaves and it's derivatives as well as the towel weaves				

	Course Contents	Hrs.				
Unit 1.	Introduction	06				
	1. Nature of textile industry in India					
	2. Various methods of fabric forming: - Weaving, knitting, braiding, non-					
	woven, brief description of all methods, processes involved in it and their					
	applications.					
	3. Weaving processes: objects of all processes. Different kinds of					
	fabrics: Grey, mono-colour, multi-colour, warp or weft stripes, checks.					
	4. Process flow charts for various fabrics					
Unit 2.	Fabric Forming	10				
	1. Outline of weaving mechanisms: - Classification of weaving machines,					
	Basic motions, primary, secondary and auxiliary, objects,					
	2. Primary motions: Detailed study of -shedding, picking, and beat- up					
	3. Secondary motions: Detailed study of take up and negative let-off.					

	4. Auxiliary motions: - Detailed study of weft fork, anti-crack, oscillating		
	backrest, warp-protecting motions and temples.		
Unit 3.	Weaving:		
	1. Study of dobby: Types of dobby, cliamax, cam dobby, method of		
	pegging.		
	2. Study of jacquard: types of jacquards, sizes and figuring capacities		
	of jacquard, harness ties.		
	3. Weft patterning: study of drop box motion, pattern chain and card		
	saving.		
Unit 4.	Fabric structure	10	
	1. Constructional details: - Warp and weft count, thread densities,		
	width, length, selvedge; light, medium, & heavy constructions, warp and		
	weft cover, cloth cover, crimp, contraction in warp and weft way during		
	weaving, introduction to interlacement of thread.		
	2. Presentation of weaves: - Design, draft & its types, peg plan, need and		
	importance.		
	3. Study of basic weaves and its derivatives: - plain, twill and satin		
Unit 5.	Towel and other weaves:	04	
	1. Toweling structures: ordinary and brighten honeycomb, huck a		
	back, mock leno.		
	2. Crepe by various methods		
Unit 6.	Calculations:	02	
	Fabric Forming: Warp weight, weft weight, fabric weight per sq.m,		
	fabric production/loom.		

Refe	Reference Books		
1	1. Weaving Mechanism by K.T. Aswani.		
2	2. Principles of weaving By Marks A.T.C. & Robinson		
3	3. Textile Colour and Design By Watson		
4	4. Weaving By Prof. D. B. Ajgaonkar, Prof. Sriramalu & Prof. M. K. Talukdar		
5	5. Weaving Calculation by Sengupta		
6	6. Textile Mathematics-Vol. I by J.E. Booth		

First Year B. Tech. Semester – II TPL175: MANUFACTURING PROCESSES - I

Teaching Scheme		Evaluation	n Scheme
Lectures	3 Hrs. / Week	SE-I	25
Total Credits	3	SE-II	25
		SEE	50
		Total	100

Course O	bjectives		
1.	To understand function of pattern - its materials, design considerations, types etc. To		
	get acquainted with moulding sands, its properties, testing, preparation &		
	conditioning, different moulding methods & core making process.		
2.	To understand construction & working of furnaces used in foundries, sand mould		
	casting, cleaning of casting, casting defects & special casting processes.		
3.	To understand principle & operation of Lathe, Milling & Drilling machines, their		
	types and concerned job holding & tool holding devices on it.		
4.	To understand principle, construction & working of Press machine, its types &		
	operations performed on it.		

Course Outcomes

At the end of the course students will be able to

1.	To explain function of pattern - its materials, design considerations, types etc. with
	the help of diagrams. To describe ingredients of moulding sands, their properties &
	testing, preparation & conditioning, different moulding methods & core making
	process with sketches.
2.	To describe construction & working of furnaces used in foundries, sand mould
	casting, cleaning of casting, casting defects & special casting processes with the help
	of diagrams.
3.	To describe with diagrams principle & operation of Lathe, Milling & Drilling
	machines and concerned job holding & tool holding devices on it.
4.	To explain with sketch principle, construction & working of Press machine, its types
	operations performed on it.

	Course Contents	Hrs.
Unit 1.	Pattern making: Introduction, Pattern materials – selection criteria,	4
	Design considerations of pattern, Types of patterns, colour codes, Master	
	pattern.	
Unit 2.	Moulding & Core making: Moulding material, Moulding sand	9
	classification, sand preparation & conditioning, Properties of moulding	
	sand & sand testing, Moulding methods - Bench moulding, Floor	
	moulding, Pit moulding, Shell Moulding & CO_2 moulding. Core making –	

	Introduction, use, core requirements, core sands, types of cores, core			
	making procedure.			
Unit 3.	Foundry: Cupola furnace, Induction furnace, Foundry processes – sand			
	mould casting - melting, pouring - cooling of molten metal - cleaning of			
	casting, casting defects. Special casting processes - Die casting (Cold			
	chamber, Hot chamber), Centrifugal casting – types.			
Unit 4.	Lathe Machine: Principle, Types, Principal parts of lathe, Important			
	operations, Job holding devices, Tool holding devices, Safety precautions			
	associated with lathe, Capstan and Turret lathe.			
Unit 5.	A) Milling Machine: Principle, Types, milling cutters, fundamentals of			
	the milling processes, milling machine operations, milling cutter material,			
	safety measures in milling.			
	B) Drilling Machine: Principle, Types, drilling machine operations, drill			
	material, safety precautions associated with drilling.			
Unit 6.	Press Work: Types of Presses, press machine terminology and its parts,			
	press size, various press working operations like cutting & forming.			

Refe	rence Books
1	Elements of Workshop Technology - Vol - I &Vol - II by S. K. HajraChoudhary, A.K.
	Hajra Choudhary & Nirjhar Roy.
2	A course in Workshop Technology – Vol – I & Vol - II by B. S. Raghuwanshi.
3	Workshop Technology (Manufacturing Prosesses) by S. K. Garg.
4	Production Technology – by R. K. Jain.
5	Foundry Technology by Sinha & Goyal.
6	Manufacturing Engineering & Technology by Serope Kalpakjian & Steven Schmid.

First Year B. Tech. Semester – II TPP176: ENGINEERING GRAPHICS LAB

Teaching Scheme		
Practical	2 Hrs. /Week	
Total Credits	1	

Evaluation Scheme		
CIE	50	
Total	50	

List of Experiments		
1.	Lines, Letterings & Dimensioning.	
2.	Conventions of section lines & I.S. conventions of machine parts.	
3.	Projection of Points and Lines, Auxiliary Plane Method	
4.	Projection of Planes, Auxiliary Plane Method	
5.	Projection of Solids, Auxiliary Plane Method	
6.	Projection of Section of Solids, Auxiliary Plane Method	
7.	Conversion of pictorial view into orthographic views.	
8.	Conversion of pictorial view into sectional orthographic views.	
9.	Free hand sketches of textile machine parts & mechanisms.	
10.	Isometric Projections.	
11.	Development of Surfaces	
12.	Autocad Commands	

First Year B. Tech. Semester – II TPP177: FABRIC MANUFACTURING MACHINERY- I LAB

Teaching Scheme		
Practical	2 Hrs. / Week	
Total Credits	2	

Evaluation Scheme		
CIE	50	
Total	50	

List of Experiments		
1.	Study of weaving preparatory and weaving process flow charts.	
2.	study of passage of yarn through plain loom.	
3.	Study of primary motions on plain loom.	
4.	Study of secondary motions on loom.	
5.	Study of auxiliary motions on loom.	
6.	Study of cliamax dobby and pattern chain making.	
7.	Study of drop box motion on loom.	
8.	Study of mechanical jacquard.	
9.	Fabric structure: plain and its derivative.	
10.	Fabric structure: twill and its derivative.	
11.	Fabric structure: satin/sateen, toweling weave.	
12.	Mill visit for plain loom shed.	

First Year B. Tech. Semester – II TPP178: MANUFACTURING PROCESSES - I LAB

Teaching Scheme	
Practical	2 Hrs. / Week
Total Credits	1

Evaluation Scheme		
CIE	50	
Total	50	

List of Experiments			
1.	Practical work related to Mechanical workshop practice. Introduction to equipments		
	and tools in pattern making & metal turning.		
2.	Preparing one job in Metal turning section.		
3.	Preparing one job in Pattern making (Carpentry) section.		

 ${\small \textbf{Submission}}-{\small \textbf{Completed Jobs \& Workshop diary}}.$

First Year B. Tech. Semester – II TPP179: FUNDAMENTALS OF COMPUTER AND PROGRAMMING LAB

Teaching Scheme		Evaluation Scheme	
Practical	2 Hrs. / Week	CIE	50
Total Credits	1	Total	50

Course Objectives		
1.	To describe basic Computer architecture and Generation of computers.	
2.	To explain operating system concept with its structure and features	
3.	To illustrate scripting language and programming	
4.	To explain basic structure of 'C' programming and formation, implementation,	
	discuss about online platform	

Course Outcomes

At the end of the course students will be able to

1.	Understand basic of computer architecture and generation of computer.
2.	Understand basic of operating system and programming language
3.	Design and implement web pages using scripting language.
4.	Understand programming concept and develop simple application programs in 'C'
	Language. Understand of online platform

	Course Contents	Hrs.
Unit 1.	Introduction: Characteristics of Computers, Block diagram of	6
Introduction	computer. Types of computers and features, Mini Computers, Micro	
to Computers	Computers, Mainframe Computers, Super Computers. Types of	
	Programming Languages (Machine Languages, Assembly Languages,	
	High Level Languages). Data Organization, Drives, Files, Directories.	
	Types of Memory (Primary and Secondary) RAM, ROM, PROM, and	
	EPROM. Secondary Storage Devices (FD, CD, HD, Pen drive), I/O	
	Devices (Scanners, Plotters, LCD, Plasma Display), Number Systems	
	Introduction to Binary, Octal, Hexadecimal number system	
	Conversion, Simple Addition, Subtraction, Multiplication using	
	number system.	
Unit 2.	Operating System: Types of operating system, Functions,	6
Computer	Unix/Linux, Windows 7/Windows 8-structures & features, Unix/Linux	
Software	commands: Listing, changing, copying and moving files & directories	
	(LS, CD, CAT, MKDIR, RMDIR, and other commands), any editor in	
	Linux. Application Software's: Word processor, spreadsheets,	
	presentation, application, DBMS, etc.	
Unit 3.	HTML: use of commenting, headers, text styling, images, formatting	4
Dynamic	text with , special characters, horizontal rules, line breaks,	
Web Page	table, forms, image maps, <meta/> tags, <frameset> tags, file</frameset>	

Design	formats including image formats. Introduction to VB script, basics of VB scripting, Java script.	
Unit 4. Programming with 'C' Language	Introduction to 'C' Programming : Algorithm & flowchart, keywords, statements, Loops, Array representation, one dimensional array, structure, define structure variable, accessing structure member, pointer, pointer arithmetic, pointer & array.	6
Unit 5. Online Platform	Online Meeting, online Presentation, online exam, online webinars, online study platforms.	4

Refe	Reference Books			
1	Fundamentals of Computers by V. Rajaram, PHI Publications.			
2	Introduction to Information Technology, ITL Education Solutions LTD. Pearson			
	Education			
3	Let us C by Y.P. Kanetkar, BPB Publication			
4	Beginning Java Script, 4Ed by Jeremy Mcpeak Paul Wilton			

List of Experiments		
1.	Study of basic parts of Computer System	
2.	Study of Linux Commands	
3.	Create spreadsheet application to manipulate numbers, formula and graphs in	
	Linux/MS Office	
4.	Create a Power Point presentation application using Text, Image, Animation using	
	Linux/MS Office	
5.	Create a simple personal web page using HTML	
6.	Create a simple web page using VB Script	
7.	Program for Addition, subtraction, Multiplication, Division of two numbers using	
	C Language in Linux Platform	
8.	Program for different types of loops using C Language in Linux Platform	
9.	Program for one-dimensional array using C Language in Linux Platform	
10.	Program for two-dimensional array using C Language in Linux Platform	
11.	Study of Online Platform-I	
12.	Study of Online Platform-II	

First Year B. Tech. Semester – II DEMOCRACY, ELECTIONS AND GOOD GOVERNANCE

Evaluation Scheme*	
CIE	50
Total	50

Course Objectives	
1.	By studying on their own, students will try to understand importance of democracy,
	election to local self-government bodies and good governance.

Course Outcomes		
At the end of the course students will be able to		
1.	Answer questions related to democracy, election to local self-government bodies	
	and good governance.	

	Course Contents*
Unit 1.	Democracy in India
	• Dimensions of Democracy: Social, Economic and Political
	Decentralisation: Grassroots Level Democracy
	• Challenges before Democracy: women and marginalised sections of the
	society
Unit 2.	Election to Local Self Government Bodies
	• 73rd and 74th Constitutional Amendment Acts: Institutions at the local level
	and Role of State Election commission
	Local Body Elections: Urban & Rural
	• Duties of an Individual towards electoral process
Unit 3.	Good Governance
	Meaning and concept
	Government and Governance
	Good Governance initiatives in India

* Students have to pass this subject by studying on their own & by securing minimum 20 marks out of 50, passing of this course is compulsory.