

Program name

**BACHELOR OF ENGINEERING
(TEXTILE TECHNOLOGY)**

Program code

619112



Department of Textile Engineering

Faculty of Technology and Engineering

The Maharaja Sayajirao University of Baroda

Vadodara

PSO for B.E. (Textile Technology)

- PSO1: Graduates of the program will have the ability to apply knowledge of Basic science, engineering and Textile Technology in identifying and providing appropriate solution for textile manufacturing industry.
- PSO2: Graduates of the program will have the ability to design, optimize textile process and Textile machinery to develop quality and cost-effective products.
- PSO3: Graduates of the program will have successful career in design, development, manufacturing, production planning and process control of textile machines for textile industry.
- PSO4: Graduates of the program will have the continual learning ability and will be adapting to the constantly changing technology.
- PSO5: Graduates of the program will have necessary skills to take up Entrepreneurial Venture.
- PSO6: Graduates of the program will serve to the needs of Textile Industry and the Nation.
- PSO7: Graduates of the program will be able enhance skill and other skill related issues for textile industry.
- PSO8: Graduates of the program (especially female) will get platform to design & create prototypes with changing demands of the textile market and fashion segment.

Bloom's Taxonomy Levels: 1. Remember 2. Understand 3. Application 4. Analysis 5. Evaluation 6. Creation

Titles of Courses and Detailed Syllabi

w.e.f. 2019-20

(B.E. SEM-I [FSBE-I] & SEM-II [SSBE-I])
(B.E. SEM-I [FSBE-II] & SEM-II [SSBE-II])
(B.E. SEM-I [FSBE-III] & SEM-II [SSBE-III])
(B.E. SEM-I [FSBE-IV] & SEM-II [SSBE-IV])

Sr. No	Subject Code	Subject Title	Page No.
F.S. B.E.-I	APH1101	Applied Physics-I	
	APH1101L	Applied Physics-I Lab	
	AMT1101	Applied Mathematics-I	
	MEC1101	Engineering Drawing-I	
	MEC1101L	Engineering Drawing-I Lab	
	MME1101	Material Science	
	CVL1104	Fundamentals of Civil Engineering and Environmental Engineering	
	CVL1104L	Fundamentals of Civil Engineering and Environmental Engineering Lab	
	MEC1102	Workshop Practice-I	
S.S. B.E.-I	APH1201/APH1206	Applied Physics-II	
	APH1201L/APH1206L	Applied Physics-II Lab	
	AMT1202	Mathematics & Statistical Methods	
	AMT1202L	Mathematics & Statistical Methods Lab	
	TXE1202	Textile Fibres	
	MEC1207	Mechanical Engineering	
	AMT1203	Introduction to Computer & Numerical Analysis	

	AMT1203L	Introduction to Computer & Numerical Analysis Lab	
	TXE1201	Introduction to Textiles	
	TXE1201L	Introduction to Textiles Lab	
F.S. B.E.-II	APH1301	Fibre Science and Textile Physics	
	APM1302	Applied Mechanics	
	APM1302L	Applied Mechanics Lab	
	TXC1305	Textile Chemistry-I	
	TXC1305L	Textile Chemistry-I Lab	
	ACH1307	Chemistry	
	ACH1307L	Chemistry Lab	
	TXE1306	Principles of Yarn Manufacturing	
S.S. B.E.-II	ACH1404	Applied Chemistry	
	ACH1404L	Applied Chemistry Lab	
	TXE1402	Spinning -I	
	TXE1402L	Spinning -I Lab	
	TXE1403	Weaving-I	
	TXE1403L	Weaving-I Lab	
	TXE1404	Yarn Preparation-I	
	TXE1404L	Yarn Preparation-I Lab	
F.S. B.E.-III	ELE1511	Electrical Engineering Fundamental	
	ELE1511L	Electrical Engineering Fundamental Lab	
	CBM1501	Management Of Textile Unit	
	TXE1505	Textile Machine Control and Quality Management	
	TXE1507	Textile Testing-I	
	TXE1507L	Textile Testing-I Lab	
	TXE1508	Fabric Structure	

	TXE1508L	Fabric Structure Lab	
S.S. B.E.-III	TXC1601	Textile Chemistry-II	
	TXC1601L	Textile Chemistry-II Lab	
	MEC1608	Industrial Engineering and Operation Research	
	TXE1606	Textile Testing -II	
	TXE1606L	Textile Testing -II Lab	
	TXE1607	Spinning-II	
	TXE1607L	Spinning-II Lab	
	TXE1608	Weaving-II	
	TXE1608L	Weaving-II Lab	
F.S. B.E.-IV	TXE1701	Engineering of Textile Structure	
	TXE1702	Man Made Fibre Technology-I	
	TXE1703	Spinning-III	
	TXE1703L	Spinning-III Lab	
	TXE1704	Weaving-III	
	TXE1704L	Weaving-III Lab	
	TXE1706	Yarn Preparation-II	
	TXE1706L	Yarn Preparation-II Lab	
S.S. B.E.-IV	TXE1801	Advance Fabric Structure,	
	TXE1803	Garment Technology	
	TXE1804	Knitting	
	TXE1805	Man Made Fibre Technology-II	
	TXE1805L	Man Made Fibre Technology-II Lab	
	TXE1806	Technical Textiles	
	TXE1807	Textile Production Management and Costing	
	TXE1807L	Textile Production Management and Costing Lab	

	TXE1808	Process Control and Modern Yarn Production	
	TXE1808L	Process Control and Modern Yarn Production Lab	

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering						Academic Year 2019-20	
B.E. - Textile Technology: Regular Programme									
Year	I	Core / Elective / Foundation APH1101: Applied Physics I						Credits / Hours per week 04	
Semester	I	Year of Introduction: 2007 Year of Syllabus Revision: 2012						Maximum Marks / Grade 100	
Mode of Transaction		Lectures and Tutorials							
Course Outcome (CO) APH1101									
CO1 Understand the basics of laws governing physical world.									
CO2 Application of physical laws in various engineering applications									
Unit No.	Topic/Unit	Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional(R)/Global (G) developmental needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV)and Professional Ethics (PE)

1	Interference: - Types of interference. Fresnel's biprism, White light fringes, Determination of the thickness of a thin sheet of transparent material. - Interference in thin films, Wedge-shaped film, Necessity of an extended source. - Newton's rings, Determination of wave-length of sodium light using Newton's rings, Determination of refractive index of a liquid, Newton's rings with white light. - Non-reflecting films, Michelson interferometer, Types of fringes, Uses of Michelson's interferometer, Standardization of the meter. - Fabry-Perot interferometer, Interference filters.	06	10	1,2	CO1 CO2	PSO2	EMP, ENT, SD	N,R,G	ES, PE
2	Diffraction: - Introduction, Two kinds of diffraction, Difference between interference and diffraction. - Fraunhofer diffraction at a circular aperture, Plane diffraction	06	10	1,2	CO1 CO2	PSO2			

	grating, Formation of multiple spectra with grating, Maximum number of orders available with a grating. - Absent spectra with a diffraction grating, Effect of increase in the width of ruled surface. - Determination of wavelength, dispersive power of grating.								
3	Resolving Power of Optical Instruments: - Meaning of resolving power, Rayleighs criterion of resolution. - Resolving power of grating, prism, telescope and microscope.	06	06	1,2	CO1 CO2	PSO6			
4	Polarization: - Geometry of calcite crystal, double refraction, Nicol's prism, Huygen's theory of double refraction. - Quarter-wave plate, polarization by selective absorption. Half-wave plate. - Elliptically and circularly polarized light, production of circularly and elliptically polarized	04	10	1,2	CO1 CO2	PSO2			

	light, conversion of elliptically polarized light into circularly polarized light, analysis of polarized light of different kinds. • Ken effect. Optical activity, specific rotation, Laurent's half shade polarimeter. Photo elasticity.									
5	LASER: • Lasers, spontaneous and stimulated emission, population inversion, pumping and active system. • The Ruby laser. Gas laser. Semiconductor laser. • CO2 laser, design of CO2 laser, mechanism of CO2 laser. • Uses of lasers.	05	10	1,2,3,4	CO1 CO2	PSO2				
6	Semiconductor Diode Applications and Solar Cells: • Rectifier, ripple factor, capacitor filter. • Types of Solar Cells, p-n junction Solar Cells Characteristics, Efficiency.	03	04	1,2,3,4	CO1 CO2	PSO2 PSO6 PSO7				

7	Ultrasonics: • Ultrasonic waves, production of ultrasonic waves. • Detection of ultrasonic, properties of ultrasonic, wavelength of ultrasonic waves. • Applications of ultrasonic waves.	08	10	2,3,4,5	CO1 CO2	PSO2 PSO6			
8	Maxwell's equations and electromagnetic waves: • Vector field, Irrotational vector field, rotational vector fields (curl), source and sinks of vector fields -divergence theorem. • Basic laws of electricity and magnetism- different forms. • Lumped and distributed elements -oscillations, electromagnetic cavity oscillator. • Charge conservation law — continuity equation, displacement current. • Maxwell's equations, electromagnetic waves in free space.	08	10		CO1 CO2	PSO2			
9	Waves and Particles:	08	10		CO1	PSO2			

	- Equation of motion of matter waves, physical interpretation of wave function - Operators. Eigen functions and Eigen values, momentum and energy operators, properties of wave functions - Solution of Schrodinger equation. Stationary state solutions. - The free particle, particle in a box, energy levels of a particle enclosed in one-dimensional potential box of infinite height. - The hydrogen atom (qualitative). Barrier Tunneling, STM, electron microscope.				CO2				
10	Temperature and its measurement: - Liquid thermometers, mercury thermometers, errors in mercury thermometers. - Bimetallic thermometers. Platinum resistance thermometers, thermoelectric thermometers, Pyrometers, Fery's total radiation pyrometer. Disappearing filament optical	03	10		CO1 CO2	PSO2			

	pyrometer. Factors for the selection of a thermometer for a particular use, temperature range of various thermometers.								
11	Vacuum technology: - Introduction, exhaust pump and their characteristics, different types of pumps. - Rotary oil pumps. Diffusion pump. - Measurement of low pressure, Pirani gauge.	03	10		CO1 CO2	PSO2			
Reference Books									
1.	Engineering Physics: by R. K. Gaur and S. L. Gupta, Dhanpat Rai Publications (P) Ltd. 8 th Edition.								
2.	Fundamentals of Physics: by D. Halliday, R Resnick and J. Walker, Asian Books Pvt. Ltd. 6 th Edition								
3.	Modern Engineering Physics: by A. S. Vasudeva, S. Chand and Company Ltd.								
4.	A Textbook of Engineering Physics by MN Avadhanulu & PG Kshirsagar, S Chand Publishers								

 सत्यं शिवं सुन्दरम्	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering	Academic Year 2020-21						
B.E. - Textile Technology: Regular Programme								
Year	I	Core / Elective / Foundation APH1101L : Applied Physics Laboratory Practical	Credits / Hours per week 03					
Semester	I	Year of Introduction: 2007 Year of Syllabus Revision: 2016	Maximum Marks / Grade 50					
Mode of Transaction	Laboratory Experiments, discussion and viva							
Course Outcome (CO) APH1101L CO1 Understanding the optics CO2 Understanding the physical properties through experiments CO3 Methods to determine physical properties CO4 Understanding of advances in instrumentation CO5 Understanding the spectroscopy								
No.	Experiment	Hours	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional(R)/Global (G)	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV) and Professional Ethics (PE)
1	Newton's Rings: To Study the interference patterns from single monochromatic source and find out the Radius of Curvature of given Plano-Convex lens from the obtain interference pattern.	06	1,2	CO1, CO2	PSO1, PSO2	SD	G	PE

2	Diffraction Grating: To study the diffraction pattern from sodium vapor lamp and find out the wavelength of this source by using diffraction pattern that obtain with the help of Transmission Grating.	06	2	CO1 CO2	PSO1, PSO2			
3	Frequency of AC Mains: To determine the frequency of A. C. Mains.	06	2,3	CO3 CO4	PSO1, PSO2			
4	Ultrasonic Waves: To determine the frequency of Ultrasonic waves and find out the velocity of Ultrasonic wave in air medium by using the interference theory of longitudinal wave.	06	3,4		PSO1, PSO3			
5	Resolving Power of Telescope:- Comparative study between resolving power of Travelling Microscope and Telescope.	06	2,3	CO1 CO2	PSO1, PSO4			
6	Solar Cell: Study of various parameters of solar cell	06	2,3		PSO1, PSO3			
7	Dispersion of Light: Calculate the refractive index of different wavelength associated with white light using the prism.	06	3,4		PSO1, PSO3			
8	Laser Parameters: (1) To determine the full angular divergence of the given gas laser. (2) To determine the wavelength of the given laser source using diffraction by grating.	06	3,4	CO5	PSO1, PSO3			
9	Polari meter: To determine the specific rotation of the given optically active substance.	06	2,3,4	CO1 CO2	PSO1, PSO3			
10	Rectifier Circuits: To study the process of rectification through half wave, full wave and bridge rectifiers.	06	2,3,4	CO3 CO4	PSO1, PSO4			

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2020-21					
B.E. - Textile Technology: Regular Programme										
Year	I	Core / Elective / Foundation AMT 1101: APPLIED MATHEMATICS-I	Credits / Hours per week				04			
Semester	I	Year of Introduction: 2010 Year of Syllabus Revision: 2016	Maximum Marks / Grade				100			
Mode of Transaction		Lecture								
Course Outcome (CO) (AMT1101)										
CO1 Evaluate successive differentiation of given function and solve identities involving higher order derivatives, evaluate radius of curvature, obtain Taylor & Maclaurin series expansion of function of single variable. Evaluate limits of indeterminate forms.										
CO2 Test for convergence sequences and positive term series using various tests like comparison test, ratio test. Also find the convergence, absolute and conditional convergence for alternating series.										
CO3 Understand the requirement of complex numbers their various representations, Demovier’s theorem and its applications. Logarithm of complex numbers. Evaluate and use circular functions, hyperbolic functions.										
CO4 Classify the differential equations with respect to their order and linearity, explain the meaning of different types of solutions of a differential equation.										
CO5 Identify and solve the 1 st order differential equations.										
CO6 Apply the method of undetermined coefficients to solve the non-homogeneous linear differential equations with constant coefficients.										
CO7 Apply the method "variations of parameters" to find to solution of higher-order linear differential equations with variable coefficients.										
CO8 Solve the Cauchy-Euler equations and systems of linear differential equations .										
CO9 Analyze real-world problems in field of Engineering like problems related to bending of beams, mixtures, growth and decay, heating and cooling, electric circuits, Spring-mass system etc.										
CO10 Find series solutions of Bessel differential equation and Legendre’s differential equations and make use of the properties of Bessel’s functions and Legendre polynomials to study and analyze the solution.										
Unit No.	Topic		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability	Relevance to Local (L)/ National	Relation to Gender (G),

							(Emp)/ Entrepre neurship (Ent)/ Skill Develop ment (SD)	(N)/ Regional(R)/Global (G)	Environ ment and Sustaina bility (ES), Human Values (HV)and Professio nal Ethics (PE)
1	Calculus: Reorientation, Functions of one variable Application of derivatives, Curvature, Successive differentiation, Partial derivatives, Leibnitz rule for the nth order derivative of a function, Techniques of partial derivatives.	8	16.67	1,2,3,5	CO1		Emp, SD	G	PE
2	Infinite Series: Sequence and their convergence , convergence and divergence of infinite series, Geometric series, P – Series ,Necessary condition for convergence, Comparison test, ratio test Absolute convergence and conditional convergence of alternating series, Maclaurin's & Taylor's expansion with reminder form, Indeterminate forms L'Hospital's rule	8	16.67	1,2,3,4	CO2				
3	Complex Numbers: Complex numbers & their geometrical representation, Complex numbers in polar form, Demoivre's theorem and its applications, Exponential, logarithmic, trigonometric & hyperbolic functions.	8	16.67	1,2,3,4	CO3				
4	Differential Equations Reorientation, Modeling of engineering systems pertaining to first order differential equations, Exact differential equations, integrating factors, Unified approach to first order ordinary differential equations, Equations of first order and higher degree.	8	16.67	1,2,3,5	CO4 CO5 CO9				
5	Linear differential equations of higher order with constant coefficients and with variable coefficients Models of higher order differential equations, Method of variation of	10	20.83	1,2,3,5	CO6 CO7 CO8				

	parameters, Simultaneous linear differential equations Method of solution in series				CO9				
6	Bessel and Legendre's equations, Properties of Bessel functions Introduction to Legendre polynomials	6	12.5	1,4,5	CO10				

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering			Academic Year 2020-21						
B.E. - Textile Technology: Regular Programme											
Year	I	Core / Elective / Foundation MEC 1101: Engineering Drawing I			Credits / Hours per week			Lectures: 04 Practical:- 04			
Semester	I	Year of Introduction: 2016 Year of Syllabus Revision: ----			Maximum Marks / Grade			Theory: 100 PR/TW/VIVA: 50			
Mode of Transaction		Lectures									
Course Outcome (CO) MEC 1101											
CO 1 Use the drawing instruments effectively and how to use the dimensioning methods.											
CO 2 Observe, analyse and correlate two-dimensional (Orthographic view) and three dimensional (Isometric view)											
CO 3 Construct and application of various engineering curves in engineering practice											
CO 4 Apply the knowledge of Projection of points, Lines and Planes in engineering											
CO 5 Create freehand sketches of basic machine components											
Unit No.	Topic/Unit			Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/Entrepreneurs hip (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional(R)/ Global (G) developmental needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV)and Professional Ethics (PE)
1.	Introduction to Engineering Curves: Introduction to conic sections, types of conic sections, eccentricity, construction of conic sections(parabola, ellipse , hyperbola) by different methods. Construction of involutes.			08	20	1,2,6	CO3	PSO1,2,3	Emp, Ent, SD	L,N,R,G	G, ES, HV, PE

	construction of cycloid, epicycloid and hypocycloid, construction of spiral, construction of normal and tangent to all curves.								
2.	Free hand sketches: Parts of screw thread and its types, conventional representation of threads, screwed fastening-types of nuts, bolts, set screws, locking arrangement of nuts, foundation bolts, riveted and welded joints, forms and proportions of rivet heads, representation of welded joints, shaft keys and couplings- types of keys, cotter joint, knuckle joint, double cotter/sleeve joint, types of couplings.	08	10	1,2,6	CO5	PSO1,2,3			
3.	Projection of Point and Line Introduction to principal planes of projections, projections of points located with respect to reference planes (in different quadrants), Projection of Lines, Line parallel to reference planes, Line parallel to one reference plane and inclined to other reference plane, Line inclined to both the reference planes, Application of all variants	08	20	3,4,6	CO4	PSO1,2,3			
4.	Projection of Planes Projection of Planes (Polygons, circle, semi-circle, ellipse etc.). Plane parallel to one reference plane and inclined to other, Plane inclined to both the reference plane, Concept of auxiliary plane method for projection of plane.	08	10	1,2,4	CO4	PSO1,2,3			
5.	Orthographic projection Fundamental of projection along with classification, Projections from the pictorial view of the object on the principal planes for	10	20	2,3,5	CO2	PSO1,2,3			

	view from front, top and sides using first angle projection method and third angle projection method, full sectional view								
6	Isometric Projections and Isometric View or Drawing: Isometric Scale, Conversion of orthographic views into isometric projection, isometric view or drawing of objects	10	20	2,4,5	CO2	PSO1,2,3			

Reference book

1.	Bhatt, N.D., 'Engineering Drawing',
2.	Shah, P. J., 'Engineering Drawing',
3.	Bhatt, N.D., 'Machine Drawing',
4.	Dhawan, R.K., 'A Textbook of Engineering Drawing',
5.	Venugopal, K., 'Engineering Drawing and Graphics'
6.	M. Raja Roy, B.V.R. Gupta, 'Engineering Drawing with AutoCAD',

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		B.E. - Textile Technology: Regular Programme						
Year	I	Core / Elective / Foundation MEC1101L Engineering Drawing-I (Practical/TW/Viva)		Credits / Hours per week		02		
Semester	I	Year of Introduction:1954 Year of Syllabus Revision: NA		Maximum Marks / Grade		50		
Mode of Transaction		Term work, Practical and viva						
No.	Experiment			Contact hours	Weightage (%)	BT Level	CO	PSO
1	Different types of Engineering Curves:			08	20	1,2,6	CO3	PSO1,2,3
2	Free hand sketches:			08	10	1,2,6	CO5	PSO1,2,3
3	Projection of Point and Line			08	20	3,4,6	CO4	PSO1,2,3
4	Projection of Planes			08	10	1,2,4	CO4	PSO1,2,3
5	Orthographic projection			10	20	2,3,5	CO2	PSO1,2,3
6	Isometric Projections and Isometric View or Drawing:			10	20	2,4,5	CO2	PSO1,2,3

		The Maharaja Sayajirao University of Baroda Faculty of Technology and Engineering Department of Textile Engineering			Academic Year			2020-2021			
B.E. - Textile Technology: Regular Programme											
Year	I	Core / Elective / Foundation : MME1101 Materials Science			Credits / Hours per Week			04 (Theory)			
Semester	I	Year of Introduction :			Maximum Marks / Grade			100 (Theory)			
Mode of Transactions				Lectures and Tutorials							
Course Outcome (CO) / <u>MET 1101</u> CO-1: Understanding of materials and their classification CO-2: Study about crystals and lattices parameters CO-4: Studies of phase important with their diagrams and materials defects CO-5: Learning about ceramics and glasses materials CO-6: Understanding briefly causes and types of corrossions and their protection methods CO-7: Study about electronics and electrical materials CO-8: Learn about some advanced materials and their uses											
Unit No.	Topic/Unit			Contact Hours	Weightage (%)	^[1] BT Level	CO	PSO	^[2] Elements of EMP/ENT/SD	^[3] Relevance to L/R/N/G	^[4] Relation to GN/ES/HV/PE
1	Introduction of Engineering Materials Metalica Materials, Ceramic Material, Polymers, Composite and Nano-materials.			02	10%	1/2/3/4	CO1		SD	G	ES
2	Crystal Structure Crystallography, Atomic structure and; Structure of crystalline solids; Lattices, unit cells; Crystal systems, Bravais lattices; Indexing of directions and			06	15%	1/2/3/5	CO2		SD	G	ES

	planes, notations, Inter-planar spacings and angles, co-ordination number, packing factors stacking sequence in BCC, FCC and HCP.								
3	Mechanical Properties of Materials Concepts of stress and strain, Stress-Strain diagrams; Properties obtained from the tensile test; Elastic deformation, Plastic deformation. Impact Testing & toughness behavior. Hardness of materials.	08	15%	1/2/3	CO3		SD	G	ES
4	Phase diagram Gibbs phase rule, Binary phase diagram its types, solid solution – Hume Rothery Rules. Imperfections: Point defects, Line defects and surface defects – grain boundary, tilt boundary and twin boundary, Grain, Grain size number. Burgers vector and its representation.	08	15%	1/2/3	CO4		SD	G	ES
5	Ceramic Materials Introduction, ceramic structures, silicate structures, Processing of ceramics; Properties, glasses; Composite Materials- Introduction, classification, metal-matrix, ceramic-matrix and polymer matrix composites.	05	10%	1/2	CO5		SD	G	ES
6	Corrosion Types of corrosion – Dry and Wet corrosion, Electro chemical and oxidation (Chemical) corrosion. Corrosion prevention – anodic and cathodic protection & coatings	06	15%	1/2/3	CO6		SD	G	ES

7	Electrical & Electronic Materials Intrinsic and Extrinsic Semi conductivity, Dielectric material, Piezo-electric materials. Magnetic Materials: Introduction, classification of magnetic materials, soft & hard magnetic materials.	05	10%	1/2	CO7		SD	G	ES
8	Advanced Materials Nano Materials & its application, Metallic glasses, Super conducting material, optic fibers, smart materials.	05	10%	1/2	CO8		SD	G	ES
		45	100%						
Text Books or Reference Books:									
1.	Askeland D.R., & P. P. Fullay (2007), The Science and Engineering of Materials –4th Cengage Learning Publishers								
2.	William D. Callister, Jr (2008), Callister’s Materials Science and Engineering, (Adopted by R. Balasubramaniam) Wiley-Eastern								
3.	A.S. Edelstein and R.C. Cammarata Ed. (1998), Nano Materials: Synthesis, Properties and Applications, Inst. Of Physics Publishing, UK								
4.	Raghavan V (2007), Materials Science and Engineering - A First Course, Prentice Hall, India								
5.	James F. Shackelford (1996), Introduction to Materials Science for Engineers, Prentice Hall, India								

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B.E. Textile Technology: Regular Programme										
Year	I	Core / Elective / Foundation CVL 1104 : FUNDAMENTALS OF CIVIL AND ENVIRONMENTAL ENGINEERING (NEW COURSE)						Credits / Hours per week 04		
Semester	I	Year of Introduction: 2019 Year of Syllabus Revision:	Maximum Marks / Grade					100		
Mode of Transaction		Lectures								
Course Outcome (CO) CVL CO1 To impart brief fundamental concept related to various materials and their use in building construction CO2 To study environmental pollution comprehensively and CO3 Students will know concept of linear and angular measurements CO4 Students will be aware of various constructional practices										
Unit No.	Topic		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional(R)/ Global (G)	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV) and

									d Profess ional Ethics (PE)
1	Building Material Stone - Introduction to stone – Uses of stone – Characteristics of good building stone – Availability, suitability and properties of different stone. Bricks - Comparison between stone work and brick work – Advantages of bricks – Characteristics of good brick – Standard test for brick along with field test for brick. Lime - Classification of Lime, Precautions in handling Lime. Cement - Basic ingredient of ordinary cement – Physical properties of cement – Field examinations of cement – Storing of cement and its uses. Timber - Introduction to timber – Importance of seasoning – Wood base product. Steel - Introduction – Use of different form of steel – Marketable forms of steel. Aggregates. Bitumen. FRP. Optical fiber. Plastic - Properties of plastics – Types and uses of plastic.	14 hrs	27	2,3	CO1	PSO3	(Emp), (Ent), (SD)	(L), (N), (R), (G)	(ES), (PE)
2	Environmental Science and Sustainable Development Introductory Environmental Engineering Terminology— Introduction to various types of pollution- Water and land pollution and remedial measures for control, water and wastewater quality criteria – Disposal of wastes – Air pollution and remedial for control – Ecology, Environmental Protection and legislation. Hydrologic cycle, Rain water harvesting, Green building, Solid waste management, Environment Impact Assessment, Basic environmental chemistry, Sustainable development – clean development mechanism, Global warming, Ozone layer	12 hrs	23	2,3	CO2	PSO2			

4	Deshpande P.D., (2009) Basic Civil Engineering, Nirali Prakashan Pune.
5	G.S.Birdie, Water supply & Sanitary Engg., Dhanpatrai & Sons.
6	S.C.Rangwala, Engg. Materials, Charotar Books Staff, Anand.
7	Janardan Jha Building Material
8	Surendra Singh, Building Material, Vikas Pub. Pvt. New Delhi.
9	D.N.Ghose, Material of Construction, Tata McGraw Hill Pub. Co. Ltd. New Delhi
10	Surveying & Levelling – Kanetkar & Kulkarni Vol-I A.V.G. Prakashan, Puna.
11	Elementary Survey – B.C.Punmia Vol-I. Laxmi Pub. Dariya Gunj, New Delhi.
12	Surveying & Levelling – S.C.Rangwala, Charotar Pub. House, Anand.

 सत्यं शिवं सुन्दरम्	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering				Academic Year		2019-20			
B.E. Textile Technology: Regular Programme										
Year	I	Core / Elective / Foundation CVL 1104L : FUNDAMENTALS OF CIVIL AND ENVIRONMENTAL ENGINEERING (NEW COURSE) : Field Practical				Credits / Hours per week		02		
Semester	I	Year of Introduction: 2019 Year of Syllabus Revision:				Maximum Marks / Grade		50		
Course Outcome (CO) CVL CO1 To impart brief fundamental concept related to various materials and their use in building construction CO2 To study environmental pollution comprehensively and CO3 Students will know concept of linear and angular measurements CO4 Students will be aware of various constructional practices										
Mode of Transaction		Practical's, discussion and viva				PSO1 is common for all experiments				
No.	Experiment					Contact Hours	Course Code	BT Level	CO	PSO
1	Conventional signs and symbols, scale, topographic-sheet					2	CVL1104L	1,2,3	CO3	PSO1
2	Linear measurements: tape, ranging, offsets					4	CVL1104L	2,3	CO3	PSO1
3	Compass: Introduction, Bearings					2	CVL1104L	2,3,4	CO3	PSO1
4	Auto level: Introduction, HI, Rise and fall					6	CVL110	2,3,4,5	CO3	PSO1

			4L			
5	GPS : Introduction, and demonstration	2	CVL110 4L	2,3,4	CO 3	PSO1
6	Theodolite and Total Station demonstration	6	CVL110 4L	2,3,4, 5	CO 3	PSO1
7	Any other term-work based on syllabus	4	CVL110 4L	1,2	CO 1C O4	PSO1, PSO3

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering	Academic Year	2020-21							
B. E. (Mechanical Engineering): Regular Programme Workshop Practice I										
Year	I MECH	Core MEC 1102	Credits / Hours per week				Lectures: 00 Practical:- 03			
Semester	I	Year of Introduction: Year of Syllabus Revision: 2018	Maximum Marks / Grade				Theory: NIL PR/TW/VIVA: 50			
Mode of Transaction: Lectures and Practical										
Course Outcome (CO) MEC 1102 CO1 Understand carpentry shop work ,different tools ,use of tools and hand on practices of subject. CO2 Understand Smithy workshop related tools and learning forging operation in workshop .										
Unit No.	Topic	Contact Hours	Weightage (%)	BT Level	CO	PO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional (R)/Global (G)	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV)and Professional Ethics (PE)	
1	Carpentry: Name, use and setting of hand tools, Construction of halved single mortise and tenon joints, dovetail joint, bridle joint, oblique mortise and tenon joint and rafter joint.	20	50	1,2,3, 4,5,6	Co1	Po 2,3,4	All	All	All	
2	Smithy: Tools used for preparing simple jobs in hand forging.	19	50	1,2,3, 4,5,6	Co2	Po 2,3,4,5				
		39	100							
Reference Books										
1.	Workshop Technology-I. W.A. J. Chapman Taylor & Francis									

2.	Comprehensive Workshop Technology (Manufacturing Processes). S.K. Garg Laxmi publications
3.	Workshop practice manual. K.Venkata Reddy B.S.Publications.
4.	Workshop Technology-I. Hazra and Chaudhary Media promoters & Publisher private limited

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering			Academic Year				2020-21			
B.E. (Textile Technology) : Regular Programme											
Year	I	Core / Elective / Foundation APH1201/APH1206: Applied Physics-II		Credits / Hours per week				04			
Semester	II	Year of Introduction: 2003 Year of Syllabus Revision: 2012		Maximum Marks / Grade				100			
Mode of Transaction		Lectures, Tutorials and Practical/TW/Viva									
Course Outcome (CO) APH1201 CO1 Understanding the fibres CO2 Understanding the physical properties of fibres CO3 Methods to determine physical properties CO4 Understanding of instrumentation CO5 Analysis of color CO6 Applications of fibres											
Unit No.	Topic/Unit			Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional (R)/ Global (G) development needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values

									(HV) and Professional Ethics (PE)
1	<u>Introduction to Fibres</u> Classification of fibers, Natural and Manmade fibers and their general properties, Growth of fiber, Effect of external parameters i.e. Radiation, Temperature, Pressure and other on fiber	04	06	1	CO1	PSO1	SD	L, N	PE
2	<u>Humidity, Regain and Moisture Content</u> Humidity and relative Humidity, Hygrometers, Regain and Moisture Content, measurement of regain, relation between regain and relative humidity, influence of temperature and stress	07	11	1,2	CO2 CO3	PSO1			
3	<u>Colorimetry</u> Science of colors, additive color mixture, three color mixture, spectrophotometry, dominant wavelength and purity, subtractive method of color mixing, the color of paint and inks, subtractive primaries	07	11	1,2, 3, 6	CO5	PSO1 PSO5 PSO7			
4	<u>Microscopy</u> Eye pieces, Principles and working of compound microscope, oil immersion microscope, polarization microscope, electron microscope and their use in studying surface and structure of fiber,	07	11	2, 3,4	CO4 CO6	PSO1 PSO5			
5	<u>Spectroscopy</u> Beer's law, Lambert's law, Principles and working of spectrophotometer and interpretation of UV, visible and IR spectra, sample preparation	07	11	2, 3,4	CO4 CO6	PSO1 PSO5			
6	<u>Tensile Properties of Fibers</u> Factors determining the results of Tensile experiments,	12	20	2,3	CO2 CO3	PSO1 PSO7			

	Stress, specific stress, tensile strain, strength, work of rupture, Elongation at break, initial, modulus, work factor, yield point and crimp, The effect of moisture & Temperature, Pierce's, Spencers Smith's and weak link theories.								
7	<u>Elastic Recovery</u> Introduction, Definition, Experimental methods& their results, change of Properties as a result of straining, Swelling recovery, Simple recovery model, Recovery, work of rupture and durability,	08	10	2,3	CO2 CO3	PSO1 PSO5 PSO7			
8	<u>Fiber Friction</u> Technological Effects, Measurements of Friction, Bewden and Leben's Apparatus, Static and Dynamic Capston Method, Bucide and Pollitt's Technique and Measurement of inter-fiber Friction, Static and Kinetic Friction and State of the Surface, The nature of Fiber Friction and it's applications to Fiber Friction, The Friction of Wool, Theory of directional friction.	12	20	1, 2,3	CO2 CO3	PSO1 PSO5 PSO7			

Reference Books

1.	Physical properties of Textile fibers by W.E. Morton and J.W.S. Hearle, Woodhead Publishers, UK
2.	Optics by F.W. Sears, Addison-Wesley Publishing Co. Inc.
3.	A textbook of Optics, S.L.Kakani, K.C. Bhandari, S. Chand & Sons
4.	Modern Concepts of Color and Appearance, A.K. Roy Choudhury, Oxford& IBH Publishing Co. Pvt. Ltd.
5.	Organic Spectroscopy, Y.R. Sharma, S. Chand Publishers
6.	Fibre Science & Technology by P. Ghosh
7.	A Text Book of Fibre Science by S.P.Mishra (TS 1540 M4T3)

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering				Academic Year		2020-21		
B.E. (Textile Technology): Regular Programme										
Year	I	Core / Elective / Foundation APH1201L/ APH1206L : Applied Physics-II (Practical/TW/Viva)				Credits / Hours per week		03		
Semester	II	Year of Introduction: 2003 Year of Syllabus Revision: 2012				Maximum Marks / Grade		50		
Mode of Transaction		Laboratory Experiments, TW/Viva								
No.	Experiment					Contact hrs	Course Code	BT Level	CO	PSO
1	Determine the Planck’s constant (h)using different LEDs. Use at least 4 LEDs.						APH1201TX	3,4	CO4	PSO1 PSO5
2	Determine the diameter of the given textile yarn using diffraction of light. Wavelength of the laser $\lambda = 632.9 \text{ nm}$						APH1201TX	3,5	CO3	PSO1
3	Demonstrate the exponential decay law using the given statistical board set up. Plot the necessary graphs and determine the decay constant.						APH1201TX	3,4,6	CO3	PSO1, PSO7
4	Obtain the V-I characteristic of the given Zener diode in forward and reverse bias conditions. Plot the necessary graphs.						APH1201TX	3,4	CO4	PSO1, PSO5
5	Determine the energy band-gap of a given semiconductor using the Four-probe method. Plot the necessary graph.Distance between two neighboring probes = 2.0 mm,Thickness of the semiconductor crystal = 0.5 mm						APH1201TX	3,6	CO4	PSO1, PSO5
6	Determine the friction coefficient for the given system of wood cart and the glass floor.						APH1201TX	3,4,5	CO3	PSO1, PSO7
7	Determine the Young’s modulus of the given material (wood) using the method of bending of a beam. Plot the necessary graphs.						APH1201TX	3,4,6	CO3	PSO1, PSO7

8	Determine the molar extinction coefficient (ϵ) for the given KMnO_4 (0.05N)solution. Plot the necessary graph using at least 8 points and obtain ϵ .		APH120 1TX	3,5	CO 4	PSO1, PSO7
9	Obtain the load-elongation curve for the given yarn. Determine the following from the load-elongation curve: (1) work of rupture (2) work factor (3) Initial modulus (4) yield point, Length of the yarn = 40 cm; Linear density of the yarn(pink) = 26.88 g/km		APH120 1TX	3,6	CO 3	PSO1, PSO5
10	Study the moisture content (M) and regain (R) of the given cotton specimen at constant temperature. Determine the equilibrium state. Plot the necessary graphs.		APH120 1TX	3,4,5	CO 3	PSO1, PSO5

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Applied Physics		Academic Year		2020-21					
B.E.-I (Textile Engineering/Textile Technology): Regular Programme											
Year	I	Core / Elective / Foundation AMT1202: Mathematics and Statistical Methods		Credits / Hours per week		04					
Semester	II	Year of Introduction: Year of Syllabus Revision:		Maximum Marks / Grade		100					
Mode of Transaction		Lectures and Tutorials									
Course Outcome (CO)											
CO1 Understand and Evaluate the domain, range, limit, continuity, differentiability of multivariable functions, and apply it to various applications like estimating the Taylor series expansion, maxima and minima of functions of several variables, Tangent plane and Normal line to the given surface.											
CO2 Understanding and evaluating gradient, curl, divergence of scalar and vector functions, and to determine the directional derivatives for scalar point function.											
CO3 Understands the concept of different types of line integrals with evaluation techniques.											
CO4 Understands the Double, Triple integrations and can apply it appropriately, to evaluate Volume, Mass, Area, C.G. and M.I.											
CO5 Understands the relation between double and line integrals as a Green's Theorem and can apply the concept of line integral to find out Work done, Mass, Length of curve, Area etc.											
CO6 Able to analysis, classify and interpret data to answer questions about the real world problem, and able to demonstrate the ability to analyze data by appropriately fitting, assessing, and interpreting a variety of statistical models.											
CO7 Understands the basic probability theories well, and be familiar with discrete and continuous random variables and implement it to translate uncertainty problems into probability models with application to the areas related to Textile sector.											
CO8 Understands data description, statistical inference, hypothesis testing, analysis of association and variance.											
CO9 Implement a proficiency in collection, organization, design, and drawing inferences from data using appropriate statistical methodology and problem solving skill.											
CO10 Able to analysis, classify and interpret data to answer questions about the real world problem.											
Unit No.	Topic			Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of	Relevance to	Relation to

							Employa- bility (Emp)/ Entrepre- neurship (Ent)/ Skill Develop- ment (SD)	Local (L)/ National (N)/ Regional(R)/Global (G)	Gender (G), Environ- ment and Sustaina- bility (ES), Human Values (HV)and Professio- nal Ethics (PE)
1	Partial Differentiation: Function of two variables, limit, continuity and partial derivatives, Chain rule, Euler's theorem, implicit function differentiation. Applications of partial derivatives, tangent planes and normal lines to above surfaces (by calculus method).	09	19	1,2,3	CO1	PSO1	Emp / Ent	N / G	PE
2	Vector Calculus: Scalar and vector fields, gradient of a scalar function, directional derivatives, divergence and curl of a vector field and their applications. Line integrals and its Applications, Green's Theorem.	07	14.5	1,2,3	CO2 CO3 CO5	PSO1			
3	Multiple Integration: Double integral, Change of order of integration, Triple integration, Change of variables in double and triple integrals, Applications of double and triple integration	07	14.5	2, 3, 4,5	CO4	PSO1 PSO4			
4	Statistics: <u>Reorientation of basic concepts:</u> by taking examples related to Textile Engineering. Curve fitting (least square approximation), Correlation analysis, Regression analysis.	07	14.5	1, 2, 3,5	CO6	PSO1 PSO2			

5	Probability: Reorientation and problems pertaining to Textile Engineering, Random Variables and Probability Distributions (Discrete and Continuous), Binomial probability distribution, Poisson distribution, Normal probability distribution. General idea of sampling, methods to draw a random sample, Confidence interval for mean for large and small samples.	10	21	1,2,3,4,5	CO7 CO9	PSO1 PSO2			
6	Testing of Data: General idea for testing of hypothesis, One-tailed and Two-tailed tests, Large and small sample tests, Test using p-values, Control charts for variables and attributes, chi-square test of goodness of fit, contingency tables. Analysis of Variance (ANOVA).	08	16.5	2,3,4,6	CO8 CO9 CO10	PSO1 PSO2 PSO3			
Reference Books									
1.	Erwin Kreyszig: Advanced Engineering Mathematics, (6 th edition) John-Wiley & Sons.								
2.	Wilfrad Kaplan: Advanced Calculus, Addison-Wesley Publ. Company, Inc								
3.	C.R.Wylie: Advanced Engineering Mathematics, Mc. Graw– Hill, Inc.								
4.	A.Richard: Probability and Statistics for Engineers, Johanson, PHI, 1996								
5.	S.P.Gordon & F.S.Gordon: Contemporary Statistics, Mc – Graw Hill Inc, 1994.								
6.	J.E.Booth: Textile Mathematics (Vol.I, II, III), The Textile Institute, Manchester, 1975.								
7.	J.E.Booth: Principles of Textile Testing, CBS Publishers & Distributors, 1996.								
8.	E.B.Grover & D. S. Hamby: Handbook of Textile Testing & Quality Control, Wiley India Pvt. Ltd.								
9	B.V.Ramana: Higher Engineering Mathematics, Tata Mc. Graw-Hill. (Core Engineering Series).								

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Applied Mathematics			Academic Year		2019-20	
Bachler of Textile Engineering and Textile Technology								
Year	I	Core / Elective / Foundation AMT 1202L : Mathematics & Statistical Methods-TW/Practical			Credits / Hours per week		02	
Semester	II	Year of Introduction: Year of Syllabus Revision:			Maximum Marks / Grade		50	
Mode of Transaction		Term Work, Practical and Viva						
Course Outcome (CO) CO1 Understands and be able to apply Mathematical software towards the problem solving. CO2 Able to analysis, classify and interpret data using computer algorithms. CO3 Able to demonstrate the ability to analyze data by appropriately fitting, assessing, and interpreting a variety of statistical tools. CO4 Able to apply the appropriate software programs towards the basic probability theories with application to the areas related to Textile sector. CO5 Understands and implement the appropriate software programs related to data description, statistical inference, and control charts.								
No.	Experiment				Course Code	BT Level	CO	PSO
1	Introduction to Mathematical Software.				AMT1202L	1,2	CO1	PSO1 PSO4
2	Basic inbuilt commands and functions of vectors in Mathematical Software.					1,2,3,4	CO1 CO2	PSO1 PSO4
3	Basic inbuilt commands and functions of matrices in Mathematical Software.					1, 2, 3, 4	CO1 CO2	PSO1 PSO4
4	a. Basic command for 2D – plotting using Mathematical Software. b. Presentation of frequency distribution into graphs using Mathematical Software. (Histogram, bar, pie, etc.)					1, 2, 3,4,5	CO2 CO3	PSO1 PSO4
5	Measure of central Tendency (1) Mean (2) Median (3) Mode					1,2,3,4 ,5	CO2 CO3	PSO1 PSO2 PSO4

6	(a) Measure of Dispersion: Standard Deviation and Variance (b) Relative Measure: Coefficient of variation (c) Skewness			1, 2, 3,4,5	CO2 CO3	PSO1 PSO2 PSO4
7	Correlation Analysis			1, 2, 3,4,5	CO2 CO3	PSO1 PSO2 PSO4 PSO5
8	Regression Analysis (1) Regression line y on x (2) Regression line x on y			1, 2, 3,4,5	CO1	PSO1 PSO2 PSO4 PSO5
9	Curve fitting (1) Straight line($y = a + bx$ or $y = ax + b$) (2) Parabola (3) Exponential ($y = ae^{bx}$) (4) Power function($y = ab^x$ and $y = ax^b$)			1, 2, 3,4,5	CO1 CO2	PSO1 PSO2 PSO4
10	Probability Distribution (1) Binomial Distribution (2) Poisson Distribution Normal Distribution			1, 2, 3,4,5	CO1 CO2	PSO1 PSO2 PSO4 PSO5
11	Hypothesis Testing			1, 2, 3,4,5	CO2 CO3	PSO1 PSO2 PSO4 PSO5
12	Control Charts			1, 2, 3,4,5	CO2 CO3	PSO1 PSO2 PSO4 PSO5

 सत्यं शिवं सुन्दरम्	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year				2019-20			
B.E. (Textile Technology): Regular Programme										
Year	I	Core / Elective / Foundation Textile Fibre TXE 1202	Credits / Hours per week				04			
Semester	II	Year of Introduction:1954 Year of Syllabus Revision:NA	Maximum Marks / Grade				100			
Mode of Transaction		Lectures								
Course Outcome (CO) TXC 1202										
CO 1 Learning the basic concept of the textile fibres.										
CO 2 Understanding the properties of the textile fibres.										
CO 3 Learning the manufacturing process of natural cellulosic fibres.										
CO 4 Learning the manufacturing process of natural protein fibres.										
CO 5 Understanding the morphology of the various natural fibres.										
CO 6 Learning the manufacturing process of regenerated cellulosic fibres.										
CO 7 Understanding the structure of regenerated cellulosic fibres										
CO 8 Learning the manufacturing process of mam-made fibres.										
CO 9 Learning the various spinning techniques.										
CO10 Understanding the structures of the man-made fibre.										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional(R)/ Global (G) developme	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV) and Professional

								ntal needs	Ethics (PE)
1.	Introduction of the Textile Fibres: • Definition of Textile Fibres & various terms of textiles. • Classification of the Textile Fibres. • Essential & Desirable properties of Textile Fibres. • General properties of textile fibres. • Structure, growth, geographical distribution, cultivation and grading of various natural fibres	08	13.34	1,2,3	CO1, CO2	PSO1 ,2,3,4 ,5,6,7 ,8	Emp, Ent, SD	L, N, R, G	G, ES, HV, PE
2.	Natural Fibres: • Introduction of the various Natural Fibres. • Manufacturing, morphology, constitution, physical properties, chemical properties and uses of cotton fibre. • Manufacturing, morphology, constitution, physical properties, chemical properties and uses of various Bast fibres. • Manufacturing, morphology, constitution, physical properties, chemical properties and uses of natural Protein fibres such as wool & Silk. • Introduction and basic manufacturing process and properties of other minor natural fibres.	20	33.33	1,2,3, 4,5	CO2, CO3, CO4, CO5	PSO1 ,2,3,4 ,5,6,7 ,8			
3.	Regenerated Cellulosic Fibres: • Introduction of the regenerated cellulosic fibres. • Manufacturing process of Viscose rayon fibre. • Manufacturing process of Polynosic fibres. • Manufacturing process of Crupraammonium rayon fibre. • Manufacturing process of Acetate rayon fibre.	12	20	1,2,3, 4,5	CO2, CO6 CO7	PSO1 ,2,3,4 ,5,6,7 ,8			
4.	Man-made Fibres: • Introduction & Classification of Man-made Fibres.	20	33.33	1,2,3, 4,5		PSO1 ,2,3,4			

	• Synthesis of raw material, Manufacturing Process, Structure, Physical & Chemical properties and End uses of Polyester Fibre. • Synthesis of raw material, Manufacturing Process, Structure, Physical & Chemical properties and End uses Nylon – 6 & Nylon – 6,6 Fibres. • Synthesis of raw material, Manufacturing Process, Structure, Physical & Chemical properties and End uses Acrylic Fibres. • Synthesis of raw material, Manufacturing Process, Structure, Physical & Chemical properties and End uses Polypropylene Fibres. • Synthesis of raw material, Manufacturing Process, Structure, Physical & Chemical properties and End uses Polyethylene Fibres. • Synthesis of raw material, Manufacturing Process, Structure, Physical & Chemical properties and End uses of various vinyl fibres.				CO2, CO8, CO9 CO10	,5,6,7 ,8			
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Reference Books

1.	Textile Fibres, Vol. I – Prof. V.A. Shenai
2.	Handbook of Text. Fibres. Vol.I, II & III – J. Gordon Cook
3.	Textile Fibres. Vol.II – Editor: Dr. V.K. Kothari
4.	Textile Fibres – H.V. Shreenivasamurthy
5.	Chemical Tech. of Fibrous materials – F. Sadov
6.	Man-made fibres – By R.W. Moncrieff

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year				2020-21		
B. E. (Textile Technology): Regular Programme									
Year	I Text Techno	Core mechanical engineering MEC :1207	Credits / Hours per week				Lectures: 04 Practical:- nill		
Semester	II	Year of Introduction: Year of Syllabus Revision: 2018	Maximum Marks / Grade				Theory: 100 PR/TW/VIVA:		
Mode of Transaction: Lectures									
Course Outcome (CO) MEC 1207 CO1 Understand basic laws of thermodynamics. CO2 Understand basic of second law of thermodynamic and it's working analysis. CO3 Understand basic of Reciprocating air compressor and it's analysis. CO4 Understand basic of Internal combustion engine and it's analysis. CO5 Understand basic of Gas producers. CO6 Study of theory of machine principal with various mechanism. CO7 Understand the power transmission drive and application.									
Unit No.	Topic	Contact Hours	Weightage (%)	BT Level	CO	PO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional (R)/ Global (G)	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV) and Professional Ethics (PE)
1	Theory of machines, kinematics of motion, graphical and analytical methods of finding velocity and acceleration of various links in mechanisms	10	25	1	Co6	Po2	All	All	All
2	. Belts, ropes, gears, flywheel and cams	15	25	1,3	Co7	Po2,3			
3	. Heat engineering: Gas laws - air cycles, I.C. engines, steam engine performances and maintenance, etc	15	25	3,5	Co 1,2,3	Po 3,5			
4	Steam cycles. Boiler study with reference to working and	12	25	2,6	Co1,2,	Po4			

	maintenance.				3,4,5				
		52	100						
Reference Books									
1.	Mechanical design : R S Khurmi								
2.	Thermal engineering : p k nag								
3.	Rattan, S. S., ‘Theory of Machines’, Tata McGraw Hill								

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2019-20					
B.E (Textile Technology): Regular Programme										
Year	I	Core / Elective / Foundation AMT1203 Introduction to Computer and Numerical Analysis	Credits / Hours per week		04					
Semester	II	Year of Introduction: Year of Syllabus Revision:	Maximum Marks / Grade		100					
Mode of Transaction		Lectures								
Course Outcome (CO) CO1 Learn about the flowchart and design an algorithm for a given problem and to develop simple C – programs using operators. CO2 Study about Conditional and Iterative statements which are available in C – language. CO3 Learned about the importance and use of Arrays and Functions in C – language. CO4 Learned about Strings, Pointers, Structures, Unions and Command Line Arguments. CO5 Understand the concepts like File Handling in C-language. CO6 Understanding of common numerical methods and how they are used to obtain an approximate solution the given problem. CO7 To understand the concepts of interpolation with equal and unequal intervals. CO8 To understand the concepts of numerical integral by various methods. CO9 To solve algebraic, transcendental and system of linear equations by using various techniques. CO10 To solve the ordinary differential equations with initial condition by numerical techniques. CO11 Analyze and evaluate the accuracy of common numerical method. CO12 Implementation of numerical schemes into C-Program.										
Unit No.	Topic		Contact Hours	Weightage (%)	BT Level	CO	PSO	Element s of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Develop ment	Relevan ce to Local (L)/ National (N)/ Regional (R)/Glob al (G)	Relation to Gender (G), Environm ent and Sustainab ility (ES), Human Values (HV)and Professio

							(SD)		nal Ethics (PE)
1	Programming tools and C preliminaries Introduction, Algorithms, effective procedures in problem solving, flowcharts, pseudo-code, Data types, constants, variables, type specification statements, operators and expressions, library functions, simple C programs	06	12%	1,2,5	CO1	PSO1, PSO4, PSO7	SD	G	PE
2	Control Structures in 'C' Importance and types of control structures, structured programming, if – else, switch structure, go to, while, do – while, for continue and break statement.	09	19%	1,2,3,5	CO2	PSO1, PSO4, PSO7			
3	Advance Concepts in 'C' Arrays, Functions, Structure and pointers.	09	19%	1,2,3,5	CO3, CO4, CO5	PSO1, PSO4, PSO7			
4	Interpolation and Numerical Integration Finite differences: Backward, Forward, Central Differences Newton's Forward and Backward Interpolation formulae Lagrange's formula, Newton Divided difference Interpolation formula. Numerical Integration: Trapezoidal rule, Simpson's 1/3 rd rule, Simpson's 3/8 th rule.	09	19%	1,2,3,4,5	CO6, CO7, CO8, CO11, CO12	PSO1, PSO4, PSO7			
5	Solution of Algebraic and Transcendental Equations Solution of equations of one variable: Bisection method. Regula – falsi, Newton – Raphson method Introduction to matrix algebra: Rank of matrix, Consistency of system of equations, Solution of system of linear equations, Gauss – elimination methods Gauss – Seidel, Jacobi, LU Factorization method	09	19%	1,2,3,4,5	CO6, CO9, CO11, CO12	PSO1, PSO4, PSO7			
6	Numerical solution of Ordinary Differential Equations Euler's method, Modified Euler method, Runge – Kutta method, Finite difference methods for ordinary differential equations. Applications oriented examples related to Textile engineering / Textile	06	12%	1,2,3,4,5	CO6, CO10, CO11, CO12	PSO1, PSO4, PSO7			

	Technology.								
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		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2019-20		
B.E (Textile Technology): Regular Programme								
Year	I	Core / Elective / Foundation AMT1203L- Introduction to Computer and Numerical Analysis			Credits / Hours per week		02	
Semester	II	Year of Introduction: Year of Syllabus Revision:			Maximum Marks / Grade		50	
Mode of Transaction		Term Work, Practical and Viva						
Course Outcome (CO) CO1 Learn about the flowchart and design an algorithm for a given problem and to develop simple C – programs using operators. CO2 Study about Conditional and Iterative statements which are available in C – language. CO3 Learned about the importance and use of Arrays and Functions in C – language. CO4 Learned about Strings, Pointers, Structures, Unions and Command Line Arguments. CO5 Understand the concepts like File Handling in C-language. CO6 Able to write C- program to find integration numerically. CO7 Able to write C-program to find solution of algebraic, transcendental and system of linear equations. CO8 Able to write C- program to solve ordinary differential equations with initial condition by numerical techniques.								
No.	Experiment				Course Code	BT Level	CO	PSO
1	Programs on printf(),				AMT1203L	1,2,3, 5,6	CO1	PSO1, PSO4, PSO7
2	Programs on and scanf()						CO1	
3	Programs on Conditional Statements like if, if- else, nested if-else.						CO2	
4	Programs on Conditional Statements like switch-case, continue, break, go-to.						CO2	
5	Programs on Looping Statements like for-loop, while-loop and do-while loop.						CO2	
6	Programs related to Arrays.						CO3	
7	Programs related to Functions.						CO3	
8	Programs on Character and Strings						CO4	
9	Programs on Pointers and Structures						CO4	
10	Programs on File Handling and Macros						CO5	
11	Program to find Numerical Integration.						CO6	

12	Programming on Solution of Algebraic and Transcendental functions.			CO7	
13	Program to find the solution of system of linear equations.			CO7	
14	Programming on Solution of Ordinary differential equations.			CO8	

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering							Academic Year 2019-20	
B.E (Textile Technology): Regular Programme										
Year	I	Core / Elective / Foundation Subject code: Introduction to Textiles (TXE1201)	Credits / Hours per week						04	
Semester	II	Year of Introduction: 2002 Year of Syllabus Revision: -- -	Maximum Marks / Grade						100	
Mode of Transaction		Lectures and Tutorials								
Course Outcome (CO) (TXE1201) CO 1 Summarize the yarn manufacturing processes, parameters and terms CO 2 Paraphrase the fabric manufacturing processes, parameters and terms CO 3 Explain the preparatory processes to fabric manufacture and chemical processing of fabrics CO 4 Grasp fibre types and classification and the basics of yarn spinning and weaving preparatory CO 5 Summarize the fabric production and chemical processing CO 6 Paraphrase the garment construction and testing										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional(R)/Global (G) developmental needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV)and Professional Ethics (PE)
1	Spinning Basics and Fundamental Spinning Operations: Introduction of		10.5	17.5	1, 2, 3	1	1, 2	EMP, SD	R,N,G	PE

	spinning by visiting spinning laboratory to make familiar with different machines involved in cotton yarn spinning. Definitions related to fibre, yarn and spinning. Yarn classification. Fundamental Spinning Operations: Essential and Optional; Essential: i) Opening cleaning and mixing, ii) Sliver formation, iii) Attenuation, iv) Twisting and v) Package formation, Optional: i) Doubling and ii) Combing								
2	Flow Chart of different machines used in short staple spinning: Types of beaters and openers used in opening of cotton lumps and flow chart of Blow room, Card engine, Draw frame, Speed frame, Ring frame, Sliver lap machine, Ribbon lap machine and Comber. Flow chart of different types of spinning techniques like Rotor, Air jet and Friction spinning machines. Brief study of different types of spinning techniques like Ring, Rotor, Air jet and Friction spinning machines. Combing process. Understand material flow through individual machines, different spinning techniques.	9	15.0	1, 2, 3, 4	1	1,2			
3	Concept of Fineness, Attenuation, Impurities and cleaning of other	10.5	17.5	1, 2, 3, 4	1	1, 2			

	natural fibres and testing: Yarn numbering system: Direct and Indirect, its understanding and calculations. Draft like mechanical draft and actual draft concept and their calculation, with examples of different hank of materials of different intermediate products like sliver, roving, etc. and their calculation. Impurities and its cleaning process of Wool, Jute and Silk fibres. Testing of fibres, yarn and fabric, Fibre properties.								
4	Introduction to fabric, garment manufacturing and Weaving process: Types of textile material outline of all textile process. Garment manufacturing process flow chart. Weaving: Definition of fabric, classification of fabric, Types of fabric manufacturing process, Structure of woven fabric, Different weaves, Different types of weaves, Passage of warp on plain power loom, Mechanisms of weaving machine, Fabric properties. Drawing-in & Dentering.	10.5	17.5	1, 2, 3	2	1,2			
5	Concept of Knitting, Nonwoven and braiding techniques: Knitting: Principle of loop formation, types of needle, Warp & weft knitting. Nonwoven: Different methods of	9	15.0	1, 2, 3	2	1,2			

	web forming, Different methods of web bonding. Braiding technique.								
6	Yarn preparation and chemical processing: Objective, Different types of yarn faults & packages, Weaving preparation. Winding & pirn winding: Objective, Types of winding, Removal of yarn faults. Warping: objective, Types of warping, Sizing: Objective, size paste. Chemical processing.	10.5	17.5	1, 2, 3	3	1,2			

Reference Books

1.	Fibre to Fabric by Bernard P. Corbman, published by McGraw-Hill, 1983.
2.	Weaving: Conversion of Yarn to Fabric by Peter Reeves Lord, Mansour H. Mohamed, published by Woodhead Publishing, 1982.
3.	Introduction to Textile Fibres by H V Sreenivasa Murthy, published by The textile association India, 1987
4.	Textile Yarns by B. C. Goswami, published by Wiley, 1977.
5.	Spun yarn technology by Eric Oxtoby, published by Elsevier Science, 2013.
6.	Motivation series Textiles by Andrea Wynne, published by Macmillan Education, 1997.
7.	Principles of textile testing by J. E. Booth, published by CBS publishers and distributors, 1996
8.	General Technology of cotton manufacturing by P. T. Bukayev, published by MIR Publishers, 1984.

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering				Academic Year		2019-20		
B.E. (Textile Technology) Regular Programme									
Year	I	Core / Elective / Foundation TXE1201L: Introduction to Textiles (Practical/TW/Viva)			Credits / Hours per week		02		
Semester	II	Year of Introduction: 2002 Year of Syllabus Revision: ---			Maximum Marks / Grade		50		
Mode of Transaction		Laboratory Experiments, discussion, drawing, term work and viva							
No.	Experiment				Contact hrs.	%Weight age	BT Level	CO	PSO
1	Classification of fibre, Study of various properties cotton fibre and its importance in spinning process in brief.				2	8.33	1,2	4	1,2,6
2	Spinning Process: Introduction of Spinning Process, Objectives of Spinning Process, Types of yarn, different lay out (Block diagram for spinning machine different types of yarn production)				2	8.33	1,2,3,4	4	
3	Yarn numbering system in details				2	8.33	1,2,3,4	4	
4	Introduction various section of spinning process, Layout of Blow room, study each machine of blow room in brief, study each machine of carding, draw frame, Flyer frame and ring frame in brief (only block diagram of various spinning machine)				4	8.33	1,2,3,4	4	
5	Modern methods of yarn production like open end spinning, air jet spinning, friction spinning in brief. Collection of various samples of fibre and yarn				4	8.33	1,2,3,4	4	
6	Yarn Preparatory Process for woven fabric: Objectives of Yarn Preparatory process, Flow chart of warp and weft Preparatory Process, Objectives of Winding. Process Flow Chart with function of each part. Objectives of Warping Process, Flow Chart with functions of each part. Objective of Sizing. Process Flow Chart with function of each part. Objective of Pirn winding, Flow Chart along with function of each part.				2	8.33	1,2,3,4	4	
7	Fabric manufacturing process: Characterization of fabric, Classification of loom, Flow chart of loom. Primary and Secondary motion of loom. Basic Weave: construction of Plain and Twill weave. Comparison of woven fabric with knitted fabric, Classification				2	8.33	1,2,3,4	5	

	of knitting process, knitted fabric structure Detail of Needle, Weft knitted process, Knitting Cycle Comparison of Warp and weft knitting process.					
8	Non-woven fabric manufacturing process: Classification of different type of process, Basics of Web forming and bonding method Technical Textile: Definition of Technical Textile, Classification of technical textile according to end use.	2	8.33	1,2,3,4	5	
9	Fabric Finishing Process: Finishing of cotton fabric. Different type of Printing process and Concept of Dying. Special finishes name and function.	2	8.33	1,2,3,4	5	
10	Garment manufacturing Process: The design and quality consideration for Selection of fabric from market for individual garment manufacturing process and Large-scale manufacturing of Garment. Garment manufacturing Process for Large scale manufacturing of Garment, Flow Chart and function of each process and pattern making.	2	8.33	1,2,3,4	6	
11	Collection of various samples of fabrics	4	8.33	1,2,3,4	6	
12	Introduction to testing, Brief introduction to Testing, Name and principle of various testing instrument and unit for measurement of various properties	2	8.33	1,2,3,4	6	

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year				2020-21			
B.E. (Textile Technology) : Regular Programme										
Year	II	Core / Elective / Foundation APH1301: Fibre Science and Textile Physics	Credits / Hours per week				04			
Semester	I	Year of Introduction: 2003 Year of Syllabus Revision: 2012	Maximum Marks / Grade				100			
Mode of Transaction		Lectures, Tutorials								
Course Outcome (CO) APH1201 CO1 Understanding the fibres CO2 Understanding the physical properties of fibres CO3 Methods to determine physical properties CO4 Understanding of instrumentation CO5 Understanding of electrical and optical properties of fibre CO6 Applications of fibres										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional (R)/ Global (G) development needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values

									(HV) and Professional Ethics (PE)
1	FIBER Fundamentals Basic Requirements for fibre formation, Long Chain Molecules, Crystal structures, Crystal Binding.	06	12	1	CO1	PSO1	SD	G	ES
2	Characterization: XRD technique and IR Spectroscopy Investigation of Fibre Structure using infrared absorption method. Study of X-ray diffraction patterns of fibre, Study of crystallinity (amorphous and crystalline regions).	09	19	1,2	CO2 CO3	PSO1			
3	Swelling and Thermal Properties Fibre expansion due to water absorption, expansion coefficients, relation between them and their experimental determination. Thermal parameters, structure changes in fibre on heating.	09	19	1,2, 3, 6	CO5 CO4	PSO1 PSO5 PSO7			
4	Fibre Density Measurement Displacement of Liquid method, specific gravity bottle method, flotation method, Abbott –Gooding method and density gradient tube method.	06	12	2, 3,4	CO4 CO6	PSO1 PSO5			
5	Electrical Properties Dielectric properties, Electrical resistance of fibres and its measurement, static electricity, measurement and explanation of static phenomena.	12	25	2, 3,4	CO4 CO6 CO5	PSO1 PSO5			
6	Optical Properties Refraction, absorption and dichroism, reflection and luster.	06	13	2,3,4	CO5	PSO1 PSO5			

Reference Books	
1.	Physical properties of Textile fibers by W.E. Morton and J.W.S. Hearle, Woodhead Publishers, UK
2.	Fibre Structure by Hearle and Peters
3.	Introduction to Polymer Physics by Petepechko
4.	Fibre Science & Technology by P. Ghosh (TS 1540 G4F4)
5.	A Text Book of Fibre Science by S.P.Mishra (TS 1540 M4T3)
6.	Fundamentals of Molecular Spectroscopy, C.N. Banwell&E.M.McCash, TMG Hill Publishing Co.
7.	Spectroscopy by Rajkumar

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2019-20					
B.E. (Textile Technology) : Regular Programme										
Year	II	Core / Elective / Foundation APM1302:Applied Mechanics	Credits / Hours per week				04			
Semester	I	Year of Introduction: 2010 Year of Syllabus Revision: ----	Maximum Marks / Grade				100			
Mode of Transaction		Lectures								
Course Outcome (CO) APM1302										
CO1 Comprehensive theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.										
CO2 In-depth understanding of specialist bodies of knowledge within the engineering discipline.										
CO3 To apply the concept of equilibrium to systems which can be modeled as particles in 2D, and to rigid bodies in 2D.										
CO4 To simplify and clarify mechanics problems using free body diagrams.										
CO5 To calculate different types of stresses like normal stress, shear stress etc. and corresponding stresses for various loading conditions both for static and dynamic parts of structures or machines.										
CO6 To study the various types of lifting devices.										
CO7 To study the power transmitted by various devices										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/	Relevance to Local (L)/ National (N)/ Regional(R)/ Global	Relation to Gender (G), Environment and Sustainability

							Skill Development (SD)	(G) developmental needs	(ES), Human Values (HV) and Professional Ethics (PE)
1	Forces and force system : Coplanar forces acting at a point, Force polygon. Resultant of a force and couple, Equilibrium of coplanar forces, Funicular polygon, Parallel forces, Reaction of beams.	12	20	1,2,4	CO1 CO3 CO4	PSO1	SD,Emp	G,N,R. L	--
2	Properties of lines areas and solids Centre of gravity and centroid of the plane sections, Moment of Inertia of the plane sections.	15	25	2,4	CO2	PSO1			
3	Friction and Transmission of power Friction: Equilibrium on a rough inclined plane, Angle of friction, The wedge, The screw, The screw jack. Lifting machines: Basic machines, The differential principles, Pulley blocks, Crab winches, Worm gearing, Linear law, Compound efficiency. Rope and belt drive: Simple and Compound belt drive, Velocity ratio, Length of the belt, Transmission of power, Centrifugal tension, Rope drive, Toothed gearing, Simple and Compound wheels of trains, Design of wheel train, Gear box of motor car, Epicyclic gearing, Reverted trains, Humpage's speed reduction gear, Differential gear.	18	30	2, 3, 4,5	CO3 CO4 CO6 CO7	PSO1, 2,3			
4	Strength and Elasticity of Materials and strain	15	25	1,2,4	CO4	PSO1,			

	energy Stress and Strain, Hooke's law, Elastic limit, Ultimate stress, Factor of safety, Lateral strain, Poisson's ratio, Tension Compression and Shear, Complementary shear stress, Elastic constants and relations. Suddenly applied and Impact loads, Resilience, Fatigue of Metals. Resolution of stress: Principal planes & principal stresses, Mohr's stress circle.				CO5	2,3			
Reference Books									
1.	Applied Mechanics By S. B. Junnarkar and H. J. Shah.								
2.	Mechanics of Structures Vol. I by S. B. Junnarkar and H. J. Shah.								
3.	Engineering Mechanics by H. Shames, Prantice Hall Publications.								
4.	Applied Mechanics by Ramamrutham.								
5.	Applied Mechanics by R. C. Patel & B. M. Patel, C. Jamanadas & Co.								
6.	Applied Mechanics by D.A.Low.								

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering			Academic Year		2019-20		
B.E. (Textile Technology): Regular Programme									
Year	II	Core / Elective / Foundation APM1302L: Applied Mechanics (Practical/TW/Viva)			Credits / Hours per week		04		
Semester	I	Year of Introduction: 2010 Year of Syllabus Revision: 2010			Maximum Marks / Grade		50		
Mode of Transaction		Laboratory Experiments, Graphics, discussion and viva			is common for all experiments				
No.	EXPERIMENT				Contact hrs.	%Weightage	BT Level	CO	PSO
1	LAW OF PARALLELOGRAM OF FORCES				3	5	2,3	CO1	PSO1
2	LAW OF POLYGON				3	5	2,3	CO1	PSO1
3	SIMPLE BEAM				3	5	2,3	CO3	PSO1
4	JIB CRANE				3	5	2,3	CO3	PSO1
5	THEORY OF LIFTING MACHINE				4	6.6	2,3	CO6	PSO1,2,3
6	COPMLETE TENSILE TEST ON MS BAR				4	6.6	2,3	CO5	PSO1,2,3
7	MODULUS OF ELSTICITY				4	6.6	2,3	CO5	PSO1,2,3
8	DIRECT SHEAR TEST ON MS				4	6.6	2,3	CO5	PSO1,2,3
9	COMPRESSION TEST ON MS AND CI				4	6.6	2,3	CO5	PSO1,2,3
10	IZOD IMACT TEST				4	6.6	2,3	CO5	PSO1,2,3
GRAPHICS									
11	COPLANAR CONCURRENT FORCE SYSTEM-1				3	5	2,6	CO1,2	PSO1
12	COPLANAR CONCURRENT FORCE SYSTEM-2				3	5	2,6	CO1,2	PSO1
13	COPLANAR NON-CONCURRENT FORCE SYSTEM-1				3	5	2,6	CO1,2	PSO1
14	COPLANAR NON-CONCURRENT FORCE SYSTEM-2				3	5	2,6	CO1,2	PSO1
15	REACTION OF BEAMS-1				3	5	2,6	CO3	PSO1
16	REACTION OF BEAMS-2				3	5	2,6	CO3	PSO1
17	WEDGE BLOCK FRICTION				3	5	2,6	CO4	PSO1,2,3

18	CENTROID OF PLANE LAMINA	3	5	2,6	CO4	PSO1
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		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering	Academic Year	2019-20
B.E. (Textile Technology): Regular Programme				
Year	II	Core / Elective / Foundation TXC 1305: Textile Chemistry – I	Credits / Hours per week	04
Semester	I	Year of Introduction:1954 Year of Syllabus Revision: NA	Maximum Marks / Grade	100
Mode of Transaction		Lectures		
Course Outcome (CO) TXC 1305				
CO 1 Learning various pre-treatment processes for various textile fibres.				
CO 2 Understanding the importance of the pre-treatment.				
CO 3 Learning method of application of desizing, scouring and bleaching.				
CO 4 Understanding chemistry & mechanism of desizing, scouring & bleaching.				
CO 5 Learning mercerization of cotton and its importance.				
CO 6 Understanding working principle of various machines used for pre-treatment.				
CO 7 Learning basic concept of dyes and dyeing.				
CO 8 Understanding theory and mechanism of dyeing.				
CO 9 Understanding various fastness properties of dyeing.				
CO10 Learning method of application of various dyes on cellulosic fibres.				
CO11 Understanding chemistry of dyeing of cellulosic fibres.				
CO12 Learning dyeing of natural protein fibres with different class of dyes.				
CO13 Understanding chemistry of dyeing of natural protein fibres				
CO14 Learning method of application of various dyes on polyester fabric.				
CO15 Understanding chemistry and mechanism of polyester dyeing.				
CO16 Learning method of application of various dyes on nylon fabric.				
CO17 Understanding chemistry and mechanism of nylon dyeing.				
CO18 Learning method of application of various dyes on acrylic fabric.				
CO19 Understanding chemistry and mechanism of acrylic dyeing.				
CO20 Learning various dyeing machines used for dyeing of textiles.				

CO21	Understanding working principle of different dyeing machines.								
CO22	Learning developments in dyeing machines.								
Unit No.	Topic/Unit	Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional(R)/ Global (G) developmental needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV) and Professional Ethics (PE)
1.	Pre-treatment Processes: • Introduction of various pre-treatment processes and its objects. • Brief introduction about grey inspection, stitching, shearing and cropping. • Object and types of Singeing • Chemistry, application and methods of Desizing. • Chemistry, application & mechanism of scouring process. • Classification of scouring agents. • Scouring of various natural & man-made fabrics. • Classification of bleaching agents. • Chemistry, application & mechanism of various bleaching agents. • Bleaching of various natural & man-made fabric with different bleaching agents. • Object, application & mechanism of mercerization. • Machinery employed in various pre-treatment process.	10	16.67	1,2,3,4,5	CO1, CO2, CO3, CO4, CO5, CO6	PSO1,2,3,4,5,6,7,8	Emp, Ent, SD	L, N, R, G	G, ES, HV, PE

2.	Introduction of Dyeing: • History & Introduction of dye, pigment and dyeing. • Classification of colouring matter. • Difference between dye & pigment. • Important terms & parameters of dyeing. • Theory & basic mechanism of dyeing • Elementary knowledge on evaluation of colourfastness to washing, light, perspiration etc.	10	16.67	1,2,3,4,5	CO7, CO8, CO9	PSO1,2,3,4,5,6,7,8			
3.	Dyeing of Natural fibres: • Brief information, principle of dyeing and method of application of direct, reactive, vat, Sulphur, azoic and others dyes on cellulosic fibre. • Brief information, principle of dyeing and method of application of acid, metal complex dyes on wool fibre. • Brief information, principle of dyeing and method of application of acid, metal complex dyes on Silk fibre. • Aftertreatment of dyeing to improve its fastness properties. • Faults in dyeing and their remedies.	15	25	1,2,3,4,5	CO10 CO11 CO12 CO13	PSO1,2,3,4,5,6,7,8			
4.	Dyeing of synthetic fibres: • Brief information, principle of dyeing and method of application of disperse, reactive and other dyes on polyester fabric. • Carrier used in dyeing of polyester fabric. • Brief information, principle of dyeing and method of application of acid, metal complex etc dyes on nylon fabrics. • Brief information, principle of dyeing and method of application of cationic dye on acrylic fibres.	15	25	1,2,3,4,5	CO14 CO15 CO16 CO17 CO18 CO19	PSO1,2,3,4,5,6,7,8			

	• Aftertreatment of dyeing to improve its fastness properties. • Faults in dyeing and their remedies.								
5.	Dyeing Machineries: • Essential & desirable requirements for the construction of a dyeing machine. • Working principle and diagram of Loose fibre dyeing machine, Package dyeing machine, Jigger dyeing machine, Winch dyeing machine, Beam dyeing machine, Jet dyeing machine, etc. • Some developments in Beam dyeing machine. • Some developments and faults in Jet dyeing machine.	10	16.67	1,2,3,4,5	CO20 CO21 CO22	PSO1 ,2,3,4 ,5,6,7 ,8			
Reference Books									
1.	Technology of Dyeig – Prof. V.A. Shenai								
2.	Dyeing & Chemical Technology of Textile Fibres – E. T. Trotmann								
3.	Chemical Technology of Fibrous materials – F. sadov								

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2019-20		
		B.E. (Textile Technology): Regular Programme						
Year	II	Core / Elective / Foundation TXC1305L: Textile Chemistry-I - Practical		Credits / Hours per week		04		
Semester	I	Year of Introduction:1954 Year of Syllabus Revision: NA		Maximum Marks / Grade		50		
Mode of Transaction		Term work, Practical and viva						
No.	Experiment			Contact Hours	Weightage (%)	BT Level	CO	PSO
1	Desizing of cotton with different desizing agents. (Acid & Enzyme)			02	3.33	1,2,3,4,5	1,2,3,4	1,2,3,4,5,6,7,8
2.	Scouring of cotton with enzyme and alkali.			02	3.33	1,2,3,4,5	1,2,3,4	1,2,3,4,5,6,7,8
3.	Bleaching of cotton with hypochlorite and hydrogen peroxide.			02	3.33	1,2,3,4,5	1,2,3,4	1,2,3,4,5,6,7,8
4.	Dyeing of cotton with direct dye.			04	6.67	1,2,3,4,5	8,9,10,11	1,2,3,4,5,6,7,8
5.	Dyeing of cotton with reactive dye (Hot brand & Cold brand)			04	6.67	1,2,3,4,5	8,9,10,11	1,2,3,4,5,6,7,8
6.	Dyeing of cotton with vat dye by different methods.			04	6.67	1,2,3,4,5	8,9,10,11	1,2,3,4,5,6,7,8
7.	Dyeing of cotton with solubilized vat dye.			04	6.67	1,2,3,4,5	8,9,10,11	1,2,3,4,5,6,7,8
8.	Dyeing of cotton with Sulphure dye.			02	3.33	1,2,3,4,5	8,9,10,11	1,2,3,4,5,6,7,8
9.	Dyeing of cotton with azoic colour.			02	3.33	1,2,3,4,5	8,9,10,11	1,2,3,4,5,6,7,8
10.	Dyeing of Cotton with Basic dye			02	3.33	1,2,3,4,5	8,9,10,11	1,2,3,4,5,6,7,8
11.	Dyeing of Jute fabric with Basic dye			02	3.33	1,2,3,4,5	8,9,10,11	1,2,3,4,5,6,7,8
13.	Dyeing of wool with acid dye.			04	6.67	1,2,3,4,5	8,9,12,13	1,2,3,4,5,6,7,8
14.	Dyeing of wool with metal complex dye. (1:1 metal complex & 1:2 metal complex)			04	6.67	1,2,3,4,5	8,9,12,13	1,2,3,4,5,6,7,8
15.	Dyeing of silk with acid dye.			04	6.67	1,2,3,4,5	8,9,12,13	1,2,3,4,5,6,7,8
16.	Dyeing of silk with metal complex dye. (1:1 metal complex & 1:2 metal complex)			04	6.67	1,2,3,4,5	8,9,12,13	1,2,3,4,5,6,7,8

17.	Dyeing of polyester with disperse dye by carrier, HTHP & thermosol method.	06	10	1,2,3,4,5	8,9,14,15	1,2,3,4,5,6,7,8
18.	Dyeing of nylon with acid dye.	02	3.33	1,2,3,4,5	8,9,16,17	1,2,3,4,5,6,7,8
19.	Dyeing of nylon with metal complex dye. (1:1 metal complex & 1:2 metal complex)	04	6.67	1,2,3,4,5	8,9,16,17	1,2,3,4,5,6,7,8
20.	Dyeing of acrylic with cationic dye.	02	3.33	1,2,3,4,5	8,9,18,19	1,2,3,4,5,6,7,8

 सत्यं शिवं सुन्दरम्	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering	Academic Year	2020-21							
B.E. (Textile Technology): Regular Programme										
Year	I	Core / Elective / Foundation ACH1307: Chemistry	Credits / Hours per week					04		
Semester	I	Year of Syllabus Revision: 2009	Maximum Marks / Grade					100		
Mode of Transaction		Lectures and Tutorials								
Course Outcome (CO) ACH1307 CO1 To study about hardness in water, boiler feed water and various methods employed to remove hardness. CO2 To understand basic principles of salt hydrolysis and adsorption and to learn about various adsorption isotherms. CO3 To study various theories of catalysis. CO4 To explore the basics of various metallurgical processes/extractions of metals to solve textile engineering issues. CO5 To understand manufacturing of various inorganic commodity chemicals. CO6 Introduction to Fuels and their types with respect to their calorific values. CO7 To understand cellulose and cellulose based polymeric materials.										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Develop	Relevance to Local (L)/ National (N)/ Regional (R)/Global (G)	Relation to Gender (G), Environment and Sustainability (ES), Human

Reference Books:	
1.	Engineering Chemistry: Jain and Jain, Dhanpatrai Publishing House
2.	Industrial Chemistry: B. K. Sharma, Goel Publishing House
3.	Essentials of Physical Chemistry: B. S. Bahl, A. Bahl and G. D. Tuli; S Chand & Co.

 सत्यं शिवं सुन्दरम्	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering							Academic Year 2019-20	
B.E. (Textile Technology): Regular Programme									
Year	II	Core / Elective / Foundation TXE 1306: Principles of Yarn Manufacturing				Credits / Hours per week		04(theory)	
Semester	I	Year of Introduction: 2003 Year of Syllabus Revision: ---				Maximum Marks / Grade		100(theory)	
Mode of Transaction		Lectures & Tutorials							
Course Outcome (CO) TXE 1306 CO1 Understanding the basic concepts of principles of spinning for applications in textile industry CO2 Develop techniques and method to solve various problems CO3 Concept of fundamental spinning operations CO4 Build fundamental base required for the advanced study of spinning. CO5 Learning different spinning technologies and systems CO6 Study of inter relationship between fibres and yarn properties									
Unit No.	Topic/Unit	Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional(R)/Global (G) developmental needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV)and Professional Ethics (PE)
1	a) Brief introduction to subject.	6	10	1,2	1,2,5	1,2,4,6	EMP, SD	R,N,G	ES

	b) Principles underlying the manufacturing of spun yarn. c) Different spinning systems according to staple length. d) Fabric classification – functional properties requirement.									
2	a) Classification of yarn with functional properties requirement. b) Important yarn properties – Its significance to spinning process – Norms etc	9	15	1,2,3	4,6					
3	a) Important fibre properties, its significance to spinning process Brief measurement method and importance. b) Inter relationship between fibre properties and yarn	9	15	1,2	5,6					

	properties c) Significance of staple yarn structure.								
4	a) Concept of Spinnability. b) Concept of mixing/ blending in achieving homogeneity. c) Spun silk yarn processing. d) Modern staple spinning system (Brief explanation) Rotor spinning Friction spinning and Air jet spinning.	6	10	1,2,3	5				
5	Effect of raw material characteristics on spinning, fundamental spinning operations in brief.	9	15	1,2	1,3				
6	Opening and cleaning of different natural fibers: Raw cotton impurities and its cleaning concept, Blowroom methods	9	15	1,2,3,4	2,5				

	of cleaning and opening, Raw flax processing, hackling, Raw jute processing, Spun silk processing, different carding actions and subsidiary carding actions.								
7	a) Different spinning systems like short staple, medium staple and long staple. b) Cotton spinning system, worsted spinning system, scouring process, woollen yarn spinning system, cotton waste spinning, Jute and flax spinning system,	8	12	1,2,3,	4,5				
8	Concept of fibre hooks in carding and subsidiary machines like comb.	4	8	1,2,3	4,5				

Reference Books:

1.	The Technology of Short Staple Spinning-Vol.1-W. Klein
2.	Textile Yarns by B. C. Goswami, published by Wiley, 1977.
3.	Process Control in Spinning-ATIRA-A.R. Garde

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering	Academic Year	2020-21						
B.E. (Textile Technology): Regular Programme									
Year	II	Core / Elective / Foundation ACH1404: Applied Chemistry	Credits / Hours per week	04					
Semester	I	Year of Introduction: Year of Syllabus Revision: 2009	Maximum Marks / Grade	100					
Mode of Transaction		Lectures and Tutorials							
Course Outcome (CO) ACH1404									
CO1 To learn about the bonding, molecular structure, reactivity and classes of organic compounds.									
CO2 To study the stereoisomerism and understanding of optical and geometrical isomers with respect to their role in organic compound applications.									
CO3 To study the chemistry of aliphatic and aromatic compounds. The synthesis and chemical reactions of alcohol, aldehyde, ketone and carboxylic acids based compounds with applications.									
CO4 To learn the concepts of monomers, polymer formation and polymerization techniques.									
CO5 To study the structure, preparations, and reactions of benzene and it's homologous for its industrial importance.									
CO6 To study the structure, preparations, and reactions of aromatic phenol, nitro, and sulphur containing compounds.									
CO7 To learn the importance and chemistry of heterocyclic compounds and their role in dye-stuffs									
Unit No.	Topic/Unit	Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship	Relevance to Local (L)/ National (N)/ Regional	Relation to Gender (G), Environment and Sustainable

							(Ent)/ Skill Develop ment (SD)	(R)/Glob al (G) develop mental needs	bility (ES), Human Values (HV)and Professio nal Ethics (PE)
1.	Structure and Reactivity: Atomic orbitals, hybridization, orbital representation of methane, ethane, ethene, ethyne and benzene; polarity of bonds – inductive, resonance and steric effects and their influence on acidity and basicity of organic compounds. Chemistry of Alkanes, Alkenes and Alkynes: Conformations, Preparations, mechanism and reactions	07	14	2,3,5	CO1	PSO1	Emp	G	HV
2.	Stereochemistry: Isomerism, Structural isomerism, Stereoisomerism, Geometrical isomerism, Optical isomerism, Chirality, Optical activity of Lactic acid, Tartaric acid, Racemization, Walden-Inversion, diastereomers, Meso compounds, Nomenclature- R, S and E, Z systems	06	13	1,3,5	CO2	PSO1			
3.	Alcohols : Comparative study of dehydration, oxidation, substitution and esterification of 1°, 2° and 3° alcohols. Aliphatic Aldehydes and Ketones : Nucleophilic addition reactions, aldol condensation, Cannizzaro reaction, oxidation and reduction, Haloform reaction. Aliphatic Carboxylic Acids : Preparation and reactions of mono- and di-carboxylic acids.	07	14	2,4,5,6	CO3	PSO1			
4.	Polymers and Polymerization: Types of polymers and polymerisation process, Addition polymers, stereocontrolled polymers, condensation polymers, radical, ionic and coordination, Mechanism of polymerisation.	05	10	1,2,3	CO4	PSO1			
5.	Benzene and its homologous- Preparation, properties and uses of Benzene, Electrophilic aromatic substitution reaction with mechanism, Aryl halide- Preparation, properties and uses, Nucleophilic aromatic substitution reaction with mechanism	05	10	1,2	CO5	PSO1			
6.	Aromatic Aldehydes and Ketones : Preparation and important reactions of benzaldehyde and acetophenone. Carboxylic Acids and their Derivatives: General preparation and	06	13	2,3,4	CO3	PSO1			

	reactions. Comparative acidity of carboxylic and sulphonic acids. General chemistry of acid chlorides, acid anhydrides, amides and esters								
7.	Phenols: Preparations and reactions. Relative acidity of phenol, alcohol and carboxylic acid. Reimer-Tiemann and Kolbe reactions. Nitrogen Containing Compounds: Nitrobenzene and its reduction products. Comparative basicity of aliphatic and aromatic amines. Hinsberg test for amines. Diazonium salts: Preparation and synthetic applications. Organosulphur Compounds: Introduction, synthesis and reactions of thiols and sulphonic acids.	07	14	1,2,5	CO6	PSO1			
8.	Heterocyclic Compounds : Synthesis and reactions, aromatic character of furan, pyrrole, thiophene and pyridine, indole, quinoline and isoquinoline. Dye Stuffs: Colour in relation to structure, modern views, synthesis of malachite green, fluorescein and methyl orange. Structure and synthesis of indigo and alizarin.	05	10	1,2,3	CO7	PSO1			
Reference Books:									
1.	Textbook of Organic Chemistry: Finar, I.L.								
2.	Organic Chemistry: Morrison and Boyd, Prentice-Hall of India Ltd. New Delhi.								
3.	Organic Chemistry: Mukherjee, S.M., Singh, S.P. and Kapoor, R.P.								
4.	Text book of Organic Chemistry for B.Sc. Students: Soni, P.L.								
5.	Textbook of Organic Chemistry : Bahl and Bahl								
6.	Practical Organic Chemistry: Vogel								

									nal Ethics (PE)
1.	<u>Laboratory preparation of the following organic compounds</u>						Emp	G	HV
	m-Dinitrobenzene	03	12	1,3,5	CO1	PSO1			
	Acetanilide	03	12	1,3,5	CO1	PSO1			
	Tribromophenol	03	12	1,3,5	CO1	PSO1			
	Sulphanilamide	03	12	1,3,5	CO1	PSO1			
2.	Identification of simple organic compounds qualitatively i. Urea ii. Thiourea iii. Benzoic acid iv. Cinnamic acid v. P-hydroxy benzoic acid vi. Aniline vii. P-Toluidine viii. Beta Naphthol ix. O-Nitrophenol x. Benzaldehyde xi. Acetone xii. Ethyl acetate xiii. Naphthalene xiv. Acetanilide xv. M-Dinitrobenzene						Emp	G	HV
		12	52	1,2,5	CO2	PSO1			
Reference Books:									
1.	Practical Organic Chemistry: Vogel								
2.	Identification of Organic Compounds : R C Shah								

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering							Academic Year 2019-20	
B.E (Textile Technology): Regular Programme										
Year	II	Core / Elective/ Foundation Subject code: TXE-1402 Spinning –I	Credits / Hours per week							04
Semester	II	Year of Introduction: 2003 Year of Syllabus Revision: ---	Maximum Marks / Grade							100
Mode of Transaction		Lectures and Tutorials								
Course Outcome (CO) CO 1 To understand different processes of blow room and factors affecting them CO 2 To learn the principles of carding operations, process, parameters and performance.										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional(R)/Global (G) developmental needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV)and Professional Ethics (PE)
1	a) Introduction to subject. b) Definition of ‘carding’,		08	13	1, 2, 3	2	1, 2, 3	EMP, SD	R, N, G	PE

	of fibre d) Factors affecting opening								
7	3 Cleaning (a) Different methods of cleaning of fibre (b) Different devices of cleaning of fibre (c) Machines used for cleaning (d) Factors affecting cleaning	09	16	1, 2, 3, 4	1	1,2,3,4,6			
8	4. Mixing (a) Different methods of Mixing of fibre (b) Different devices of Mixing of fibre (c) Factors affecting mixing	06	9	1, 2, 3, 4	1	1,2,3,4,6			

Reference Books

1.	A Practical Guide to Opening and Carding. Vol.2-W. Klein
2.	Cotton Spinning- William Scott Taggart- Vol.II
3.	Carding-Vol. II- Merrill.
4.	Spinning Tablet-II “CARDING” TAI (S.R. Nerurkar)

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering			Academic Year		2019-20		
B.E. (Textile Technology) Regular Programme									
Year	II	Core / Elective / Foundation TXE 1402L: Spinning –I (Practical/TW/Viva)			Credits / Hours per week		04		
Semester	II	Year of Introduction: 2003 Year of Syllabus Revision: ---			Maximum Marks / Grade		50		
Mode of Transaction		Laboratory Experiments, discussion, drawing, term work and viva							
No.	Experiment				Contact hrs.	%Weight age	BT Level	CO	PSO
1	Layout of blow room				5	8	1,2	1	1,2,6
2	function of blow room and its importance Layout of Blow room, Study of control panel and material delivery system with bypass arrangement, Various combination of machine for different cleaning point, Study diff. machines of blow room in detail, different feeding system,				5	8	1,2,3,4	1	
3	Hopper Bale Opener: Passage of material, Construction & working, drive calculation				5	8	1,2,3,4	1	
4	Vertical Opener: Passage of material, Construction & working, drive calculation				5	8	1,2,3,4	1	
5	Striker Cleaner and condenser: Passage of material, Construction & working, drive calculation				5	8	1,2,3,4	1	
6	Porcupine Opener: Passage of material, Construction & working, drive calculation				5	8	1,2,3,4	1	
7	Scutcher: Passage of material, Construction detail of each part, speed calculation, Piano feed regulating mechanism and various setting points, measurement of pressure on calendar roller, automatic lap doffing				5	8	1,2,3,4	1	
8	Maintenance of blow room machine, Production calculation.				5	8	1,2,3,4	1	
9	Carding:				5	9	1,2,3,4	2	

	Passage of material, Construction detail of each part, Study of Feed zone, Cylinder zone, Licker zone, Various web doffing device, Study of delivery zone, coiling arrangement, Study of chute feed system					
10	Tracing of gearing plan Zone wise draft calculation, draft constant calculation and its application and speed calculation, Various change wheel. Study cultch arrangement, study of different handle provided on machine,	5	9	1,2,3,4	2	
11	Wire mounting method, Grinding and stripping operations	5	9	1,2,3,4	2	
12	Maintenance of Card, Production calculation.	5	9	1,2,3,4	2	

 सत्यं शिवं सुन्दरम्	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2019-20					
B.E. (Textile Technology): Regular Programme										
Year	II	Core / Elective / Foundation TXE1403 WEAVING - I	Credits / Hours per week				04(theory)			
Semester	II	Year of Introduction: 2003 Year of Syllabus Revision: ---	Maximum Marks / Grade				100(theory)			
Mode of Transaction		Lectures & Tutorials								
Course Outcome (CO) TXE 1403 CO1 Understanding basics of power loom CO2 Understanding and learning different primary mechanisms of a power loom CO3 Understanding and learning different secondary motions of a power loom CO4 Understanding and learning different tertiary motions of a power loom										
Unit No.	Topic/Unit		Contact Hours	Weight age (%)	BT Level	CO	PSO	Elements of Employability (Emp) / Entrepreneurship (Ent)/ Skill Devel	Relevance to Local (L)/ National (N)/ Regional (R)/Global (G) developmental needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV)an

							op ment (SD)		d Professi on al Ethics (PE)
1	An overview of various fabric manufacturing process and fabric parameters. Passage of warp yarns through a plain power loom and functions of various parts, in brief, in the passage. Drive to the loom. Types of drives, their advantages and disadvantages. Various drive calculations. Concept of loom timing with the inter relations of various motions. Concept of various motions viz Primary, Secondary and auxiliary motions in brief.	06	10	1,2	CO1	1,2	EMP, SD	R,N,G	ES
2	Primary Motion::Shedding Mechanism: Function of shedding mechanism, introduction to sley drive on loom and crank circle. Shedding mechanism on plain power loom, Basic of construction of shedding cam for plain power loom, Shedding cams for simple weaves, Reversing motions, Positive cam shedding, Shedding principles – open, semi-open, bottom and centre closed shed. Timing of shedding motions – early and late shedding, Split shedding/ staggering of healds, asymmetric shedding, Effect of shed timing and back rest setting on fabric properties.	12	20	2,3,4	CO2	1,2, 6,7	EMP, SD	R,N,G	ES
3	Primary Motion::Picking Mechanism:	12	20	2,3,4	CO2	1,2,	EMP,	R,N,G	ES

	Concept of picking and its classification. Construction and working of Cone overpick mechanism in details. Why picking cam made up of three parts? Timing diagram of picking and its correlation with shedding diagram. Why dwell of shedding and picking timing doesn't match? etc.. Calculations for Shuttle speed and Power required for picking. LH & RH loom and shuttle, running time of a pirn, weft insertion rate(WIR). Shuttle checking, hinge swell, floating swell, check strap. Rest position of shuttle. Shuttle displacement by picker, causes of shuttle fly, etc. Basic understanding of underpick mechanism. Details of side lever underpick mechanism. Under pick and over-pick comparison. Early picking and late picking concept.					6,7	SD		
4	Primary Motion::Beat Up: Details of beat up mechanism on shuttle looms, Sley eccentricity and factors affecting sley eccentricity, Criteria deciding cranks radius and connecting arm lengths for loom construction , Cam driven sley	09	15	2,3,4	CO2	1,2,6,7	EMP, SD	R,N,G	ES
5	Secondary Motions::Take-up mechanism: Introduction and concept of take-up; direct & indirect take up; classification of take-up – negative and positive take up motion. 5 &7-wheel take-up mechanism details, dividend calculations, etc. and their comparison. Anti-crack motion, its importance, working and settings. Secondary Motions::Let-off Mechanism: Objects of let-off, types of let-off – Negative and positive	09	15	2,3,4	CO3	1,2,6,7	EMP, SD	R,N,G	ES

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		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering			Academic Year		2019-20		
B.E. (Textile Technology): Regular Programme									
Year	II	Core / Elective / Foundation TXE1403L: Weaving I (Practical/TW/Viva)			Credits / Hours per week		04		
Semester	II	Year of Introduction: 2003 Year of Syllabus Revision: ---			Maximum Marks / Grade		50		
Mode of Transaction		Laboratory Experiments, discussion and viva			PSO7 is common for all experiments				
No.	Experiment				Contact hrs.	%Weightage	BT Level	CO	PSO
1	Fabric Manufacturing: a. Various fabric manufacturing processes b. Passage of warp yarns through a plain power loom and functions of various parts c. Drive to the plain power loom d. Types of drives, their advantages and disadvantages e. Various drive calculations f. Loom timing with the inter relations of various motions. g. Primary, Secondary and auxiliary motions h. Calculation of Loom Efficiency				12	20%	2,3,4	CO1 CO2	PSO3 PSO6 PSO7
2	Shedding Mechanism: a. Shedding mechanism on plain power loom b. construction of shedding cam for plain power loom c. Reversing motions d. Shedding principles – open, semi-open, bottom and centre closed shed e. Timing of shedding motions, Early and late shedding concept.				12	20%	2,3,4	CO2	PSO3 PSO6 PSO7
3	Picking Mechanism: a. Classification and Concept of picking mechanism b. Construction and working of different picking mechanisms				12	20%	2,3,4	CO2	PSO3 PSO6 PSO7

	c. Construction of picking cam d. Construction of shuttle box e. Timing diagram of picking and its correlation with shedding f. Different calculations related to picking g. Comparison of different picking mechanism h. Early picking and late picking concept					
4	Beat Up Motion: a. Construction and working of beat up mechanism on shuttle looms b. Factors affecting Sley eccentricity and its Calculation	08	13.33%	2,3,4	CO2	PSO3 PSO6 PSO7
5	Secondary and Auxiliary Motions: a. Take-up mechanism: Introduction and concept b. Construction of 5 & 7-wheel take-up mechanism, and its dividend calculations c. Let-off Mechanism: Introduction and concept d. Construction and working of negative let-off motion. e. Temple: Construction and working of temple, various types of temples, mounting and settings of temples on loom. f. Brakes: Construction and working of brake on loom, different types of brakes g. Weft Stop Motion: Construction and working of weft stop motions, Timing and setting of side weft fork motion. h. Warp protector motions: Construction and working of Fast and Loose reed warp protector motion	16	26.67%	2,3,4	CO3 CO4	PSO3 PSO6 PSO7

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering					Academic Year			2019-20			
B.E. (Textile Technology): Regular Programme												
Year	II	Core / Elective / Foundation TXE1404 Yarn Preparation-I			Credits / Hours per week			04(theory)				
Semester	II	Year of Introduction: 2003 Year of Syllabus Revision: ---			Maximum Marks / Grade			100(theory)				
Mode of Transaction		Lectures & Tutorials										
Course Outcome (CO) TXE 1404 CO1 Understanding various yarn preparatory processes CO2 Understanding fundamentals of different winding packages CO3 Understanding and learning basics of different winding modes and systems CO4 Understanding and learning of different non-automatic winders and their important elements and practical aspects CO5 Understanding and learning of pirn winding machine CO6 Understanding concept of warping. CO7 understanding and learning direct and sectional warping												
Unit No.	Topics/Units				Contact Hours	Weight age (%)	BT Level	CO	PSO	Element s of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional (R)/Global (G) develop	Relation to Gender (G), Environment and Sustainability (ES), Human Values

								mental needs	(HV)and Profession al Ethics (PE)
1	Introduction to various yarn preparatory processes	2	2.5	1,2,3	CO1	PSO 1	EMP	L, N	PE
2	Objects of winding, various winding packages, advantages disadvantages, various definitions related to cross wound packages Basics of building cross wound packages – winding at constant traverse ratio, concept of gain, precision wound package, relation between traverse ratio, coil angle, traverse acceleration, traverse length and package diameter Various terminologies related to precision winding like close wind, open wind, head wind, after wind, gain and its influence on package properties, fishbone pattern in close winding, Winding package at constant mean coil angle, random wound package, patterning in random winding	6	10	1,2,3, 4,5,,6	CO2	PSO 1 PSO 2 PSO 3 PSO 4 PSO 6 PSO 7			
3	Random winding systems Precision winding systems Introduction to step precision winding and step precision winding system	6	10	1,2,3, 4,5,6	CO3	PSO 1 PSO 2 PSO 3 PSO 4 PSO 6 PSO 7			

	Comparison of random, precision and step precision winding								
4	Winding package parameters and their optimisation according to end user application	3	2.5	1,2,3,4,5,6	CO4	PSO 1 PSO 2 PSO 3 PSO 4 PSO 6 PSO 7			
5	Yarn tension during winding, ballooning yarn tension Yarn tensioning devices – additive and multiplicative yarn tensioner, measurement of yarn tension	4	05	1,2,3,4,5	CO4	PSO 1 PSO 2 PSO 3 PSO 4 PSO 6 PSO 7			
6	Yarn faults, mechanical yarn clearers, introduction to electronic yarn clearers Electronic principles of measurement of yarn faults Yarn fault classification systems, Basic yarn clearing Introduction to yarn splicing	4	10	1,2,3,4,5,6	CO4	PSO 1 PSO 2 PSO 3 PSO 4 PSO 6 PSO 7			
7	Various methods of package driving Various methods of yarn traversing	4	7.5	1,2,3,4,5,6	CO4	PSO 1 PSO 2 PSO 3 PSO 4 PSO 6 PSO 7			

8	Winding package faults and remedies	1	2.5	1,2,3,4,5	CO4	PSO 2 PSO 3 PSO 6			
9	Pirn Winding: Introduction to Yarn preparatory processes and its importance. Importance of weft supply and Different forms of weft supply system. Objects of Pirn winding machine and different processes for pirn building. Basic terms used and definition. Types of pirn winding machine. Different types and shapes of pirn and its requirement related to pirn winding Drive to spindle, Traverse mechanism, Traverse within traverse, bunching mechanism. Performance assessment of pirn winding machine Pirn winding related calculations.	15	25	2,3,4	CO5	PSO2, PSO4, PSO6			
10	Warping: Objects of warping. Classification of warping machine and its importance. Warping machine details (like type of Creel, Drive to different parts, Measuring motion, Beam doffing, etc). Features of modern warping machine. Sectional warping machine process aspects. Factors affecting thickness of sections. Causes of non-uniform built-up of section. Quality assessment of warper's beam. Warping related Calculations.	15	25	2,3,4	CO6 CO7	PSO2, PSO4, PSO6			

Reference Books:

1.	Winding monogram series : BTRA
2.	Process control in weaving : ATIRA
3.	Yarn Preparation : Sengupta
4.	Conversion of yarn to fabric : Lord and Mohammed
5.	An Introduction to winding and warping :Dr. Talukdar

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering			Academic Year		2019-20		
B.E.(Textile Technology)Regular Programme									
Year	II	Core / Elective / Foundation TXE1404L: Yarn Preparation-I (Practical/TW/Viva)			Credits / Hours per week		04		
Semester	II	Year of Introduction: 2003 Year of Syllabus Revision: ---			Maximum Marks / Grade		50		
Mode of Transaction		Laboratory Experiments, discussion, drawing, term work and viva							
No.	Experiment				Contact hrs.	%Weightage	BT Level	CO	PSO
1	Introduction to Yarn Preparatory Process, Objectives of winding, Different types of winding packages made in yarn preparation, calculation of slope of cone package				2	2%	1,2	CO1,CO2	PSO1
2	Non Automatic Random Winding Machine: Introduction, Passage of yarn through the machine				1	4%	1,2	CO3,CO4	
3	Function of each part like Creel, unwinding accelerator, yarn tensioners, clearer, thread stop motion, waxing arrangement, drums and package cradle, Construction and working and settings				2	4%	1,2,3,4	CO3,CO4	
4	Drive to conveyor belt, grooved drum and traversing guide, rocking shaft, Winding Speed Adjustment & Thread Stop Motion, Anti-patterning mechanism : Speed variation of grooved drum, to and fro motion of package holder, Blower and its function				4	4%	1,2,3,4	CO3,CO4	
5	Non-automatic random Re-winding machine: Introduction, Passage of yarn through the machine				1	4%	1,2	CO3,CO4	
6	Creel, slit clearer, motorized yarn tensioner, disc yarn tensioner, waxing device, electronic thread stop motion, drums and package cradle – Construction, working and setting and setting				2	4%	1,2,3,4	CO3,CO4	
7	Drum drive, Settings of parameters on machine screen - winding speed, slow start up, anti-patterning parameters and other production related parameters				4	4%	1,2,3,4	CO3,CO4	

8	Non-automatic electronic Re-winding machine: Introduction, passage of yarn through the machine on assembly winding and soft package winding spindles	1	4%	1,2	CO3,CO4
9	Creel, slit clearer, motorized yarn tensioner, disc yarn tensioner, electronic thread stop motion, counter rotating blade traverse, package cradle with package weight compensation device – Construction, working and setting	2	4%	1,2,3,4	CO3,CO4
10	Adjustments of touch screen panel of the machine – selecting winding mode (precision or step precision) and related parameters (traverse ratio/ coil angle), winding speed, slow start, other production related parameters	4	4%	1,2,3,4	CO3,CO4
11	Ordinary Beam Warping Machine: Objectives, Passage of material on beam warping machine and function of each part.	1	4%	1,2	CO6
12	Drive to winding drum, clutch arrangement for ON & OFF of winding drum, drive to measuring roller & thread stop motion	2	4%	1,2,3,4	CO6
13	Yarn length measuring device : measuring roller and train of gears attached to measuring dial, Warping related calculations : Production calculation	4	4%	1,2,3,4	CO6
14	Pirn Winding: Objectives of Pirn winding, types of winding, passage of yarn on pirn winding machine	2	2%	1,2	CO5
15	Drive to pirn holder, Traversing mechanism and how to set different traverse, Advancement mechanism and how to set different rate of advancement	4	8%	1,2,3,4	CO5
16	Traverse within traverse, Bunching, Full pirn stop motion & Production Calculation	4	8%	1,2,3,4	CO5
17	Sectional Warping Machine: Objectives, Passage of yarn on machine, Creel arrangement, Drive to sectional drum	4	6%	1,2	CO7
18	Variable drive to sectional drum, Lateral movement of drum	4	6%	1,2,3,4	CO7
19	Drive to V-reed and Brake Mechanism	4	6%	1,2,3,4	CO7
20	Settings of machine reduction gear box, Speed measuring device and yarn length measuring device	4	8%	1,2,3,4	CO7
21	Drive to warper's beam and Production calculation	4	6%	1,2,3,4	CO7

		The Maharaja Sayajirao University of Baroda					Academic Year		2019-20		
Faculty Technology and Engineering											
Department of Textile Engineering											
B.E. (Textile Technology) : Regular Programme											
Year	III	Core / Elective / Foundation ELE1511: Electrical Engg Fundamentals				Credits / Hours per week			04 (theory)		
Semester	I	Year of Introduction: 2007 Year of Revision: 2017-18				Maximum Marks / Grade			100 (theory)		
Mode of Transaction		Lectures & Tutorials – 3+1									
Course Outcome (CO)											
CO1 Determine the parameters of simple DC and AC circuits. (BT 5)											
CO2 Evaluate the performance of AC circuits. (BT 5)											
CO3 Explain fundamentals of DC Rotating Machines, AC Rotating machines, and Transformers. (BT 2)											
CO4 Determine the parameters of DC Rotating Machines, AC Rotating machines, and Transformers. (BT 5)											
CO5 Explain fundamentals concepts of Semiconductor Theory. (BT 2)											
Unit No.	Topic/Unit			Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional(R)/Global (G) developmental needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV)and Professional Ethics (PE)
1	Preview of Ohm’s Law. Kirchoff’s law. Series parallel			13	25%	5	CO1	PSO1, PSO5,	SD	G	PE

	connections. Solution of simple D.C. circuits, star delta transformation					PSO6			
2	Sinusoidal e.m.f. And currents. R.M.S. and average value. Phasor representation. Voltage current relations in purely resistive. Inductive and capacitive circuits and their series combination. Power and power factor. Voltage and current relation and power balanced 3 phase system. Measurement of power in 3 ϕ system.	10	20%	5	CO1, CO2				
3	D. C. GENERATORS: Principle of working. Types of generators. Their characteristics and applications D. C Motor: Principle of working. Types of motors. Their characteristics and applications, speed control.	08	20%	5	CO3, CO4				
4	Transformer: Review of Faraday's law and Lenz law. Self and mutual induction. Principle of working of transformer. E.m.f. equation. Uses of transformer,	06	15%	5	CO3, CO4				

	OC and SC test.								
5	Principle of working and Applications of Induction motor	04	8%	5	CO3, CO4				
6	Alternator: Principle of working, E.M.F equation, Types and Applications Synchronous Motor: Principle of working , Special features and its applications	03	7%	5	CO3, CO4				
7	Conductors, Semiconductors. Semiconductors and insulators. Intrinsic and Extrinsic semiconductors. Conduction in Pn, PNP and npn junctions. Their characteristics. Zener diode. Photo-diode and display devices.	02	5%	2	CO5				

Reference Books:

1.	Basic Electrical Engineering	by V.N. Mittle
2.	Electrical Technology	by B.L. Theraja
3.	Problems in Electrical Engineering	by Parker Smith

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year	2019-20			
B.E.(Textile Technology) : Regular Programme								
Year	III	Core / Elective / Foundation ELE1511L: Electrical Engineering Fundamentals		Credits / Hours per week	04/week			
Semester	I	Year of Introduction: 2017-18		Maximum Marks / Grade	50			
Mode of Transaction		Laboratory Experiments, discussion, drawing, term work and viva						
Course Outcome (CO) ELE 1511L								
CO1 Utilize measuring devices, apparatus and equipment effectively.								
CO2 Demonstrate various network theorems and 3-phase power measurement by two wattmeter method.								
CO3 Analyse various circuit configurations.								
CO4 Develop a technical report with related observations, calculations, results and inferences effectively.								
CO5 Verify various performance characteristics of d.c machines								
CO6 Evaluate performance parameters of 1-phase transformer								
No.	Experiment			Contact hrs.	%Weightage	BT Level	CO	PSO
1	Study of Laboratory apparatus.			2	8.33%	3	CO1	PSO1
2	Study of D.C machine			2	8.33%	3	CO1	
3	Verification of Kirchhoff's laws.			2	8.33%	2, 3	CO1, CO2, CO4	
4	R – L Series circuit.			2	8.33%	3,4	CO1, CO3, CO4	
5	R – L – C Series circuit			2	8.33%	3,4	CO1, CO3, CO4	
6	Power measurement in a 1 – Ø circuit by 3 voltmeter method.			2	8.33%	3,4	CO1, CO3,	

					CO4	
7	Power measurement in a 1 – Ø circuit by 3 Ammeter method.	2	8.33%	3,4	CO1, CO3, CO4	
8	AC parallel circuit.	2	8.33%	3,4	CO1, CO3, CO4	
9	Open circuit and short circuit test on 1-phase transformer	2	8.33%	3,5	CO4, CO6	
10	To plot the characteristics of D.C series generator	2	8.33%	3,4	CO4,CO5	
11	To plot the characteristics of D.C shunt generator	2	8.33%	3,4	CO4,CO5	
12	To plot the characteristics of D.C compound generator	2	8.33%	3,4	CO4,CO5	
13	Speed control of D.C. shunt motor	2	8.33%	3,4	CO4,CO5	
14	Power measurement in a 3-phase circuit by two wattmeter method	2	8.33%	2,3	CO2, CO4	

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering	Academic Year	2019-20							
Management of Textile Unit [CBM1501]: Regular Programme										
Year	III	Core / Elective / Foundation Management of Textile Unit	Credits / Hours per week					04		
Semester	I	Year of Introduction: 2007 Year of Syllabus Revision: 2012	Maximum Marks / Grade					100		
Mode of Transaction		Lectures								
Course Outcome (CO) CBM1501 CO1 Understanding Management Principle CO2 Learn about the management techniques CO3 Solving the complex organization problem CO4 Understand the General and Managerial Problem CO5 Understand basics of Management CO6 Applications of Management in Textile unit										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional (R)/ Global (G) development needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV) and

									d Profess ional Ethics (PE)
1	Organization for business : small scale, large scale, composite, non-composite units, concept of entrepreneurship	02	10	1,2,3,4	CO1	PSO1 PSO2 PSO3 PSO4	Emp, Ent, SD	N,G	PE
2	The management process : Emphasize on managerial skills and human behaviour (with special reference to communication and motivation)	02	10	1,2,3,4	CO2	PSO 1-to-4			
3	Functional areas of management : (i) Business environment : Political, legal, Economic & technological (ii) Marketing : 4P's of marketing (iii) Finance : Investment decision, finance control techniques. Main F.I's (iv) HRD Personnel : approaches, functions and techniques. (v) Purchase/Inventory : Purchase procedures. Stores Keeping, inventory decisions.	02	10	1,2,3,4	CO2	PSO 1-to-4			
4	Social concern of management : (i) Introduction to industrial relation (ii) Different Acts (Gist only) pertaining to industrial laws. The factory act, industrial disputes acts, I.R.act. The workman's compensation act, Trade union act (iii) Industrial relation scenario in respect of industrial law and industrial relations machinery	02	10	1,2,3,4	CO3	PSO 1-to-4			

Reference Books

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| 1. | Principle of Management – L. M. Prasad |
| 2. | “Management” by Stoner J A and Freeman R E |

3.	Mintzberg, H. (1973). <i>The Nature of Managerial Work</i> . New York: Harper & Row.
4.	Financial Management – I M Pandey
5.	Human Resource Management - Aswasthappa
6	Elements of Mercantile Law – N.D.Kapoor
7	Fundamentals of Business Organization & Mgt. – Y k.Bhusan
8	Entrepreneurship – Devid H. Holt
9	Essential of Management – Harold Koontz, Hienz Weihrion
10	Marketing Management - Philip Kotler
11	Management – James A.F. Stoner, R.Edward Freeman
12	Production and Operations management – Chunawala & PATEL

 THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA सत्यं शिवं सुन्दरम्	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year	2019-20
B.E. (Textile Technology): Regular Programme				
Year	III	Core / Elective / Foundation TXE 1505 Textile Machine Control and Quality Management	Credits / Hours per week	04(theory)
Semester	I	Year of Introduction: 2004 Year of Revision:---	Maximum Marks / Grade	100(theory)
Mode of Transaction		Lectures & Tutorials		
Course Outcome (CO) TXE 1505 CO1 Understanding of fundamentals of Machine and Quality Control in Textile CO2 Importance and role of Textile Machine controls on quality products and application CO3 Importance and Role of Quality control system on total quality of Textile industry CO4 Designs and tools for of control system and quality system CO5 Understanding the methods and requirement to adopting system in application CO6 Learn new developments in machine and Quality concept in Industry 4.0 CO7 Solving typical problem related to system requirements and Learn New design system. CO8 Quality and its importance. Quality management development process CO9 Various standards and documentation procedure. Trouble shooting CO10 Various standards of ISO9000 and TQM in details CO11 Various regulations and its role in QM				

Unit No.	Topic/Unit	Contact Hours	Weight age (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional (R)/ Global (G) developmental needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV) and Professional Ethics (PE)
1	Development in Textile Machine, Automation and Textile Machinery 4.0 concept, System Engineering Concepts, Different types of Controls, Introduction to Machine Controls	6	10	1,2,3	CO1	PSO1			
2	Open and Close loop Control Systems, Sensor in Textile Machine, Functional elements Principles and Objectives and application	6	10	1,2,3	CO2	PSO1, PSO2			
3	Construction and Working of different element of Close loop System : Signal conditioning unit, A/D and D/A Converter, Controllers: PLC and Logical controls	9	15	1,2,3,5	CO2, CO4	PSO1, PSO2, PSO3			

	Amplifier, Final control Element						Emp, Sd	N,G	ES
4	Understand concepts of digitization, change in machine control concept and practical application in total control of industry.	4	6.67	2,3	CO 5, CO 6	PSO4, PSO6, PSO 7			
5	Application of controls system in Textile machinery in different process	5	8.33	2,3, 5	CO4, CO6	PSO 4, PSO 5			
6	Introduction to quality management concepts and various systems. Need of quality management, their relevance and tools of quality management. Industrial revolutions and the development of quality management.	9	15	1,2,3, 5	CO8	PSO1, PSO4, PSO5, PSO6, PSO7			
7	Documentation and standardization. International trade, trade barriers. GATT, WTO, etc.. Various standards for management systems. Six sigma concept and its role in quality management. Flexibility and change in management systems and documentation procedures. Ishikawa Pareto analysis, cause and effect/fishbone analysis, etc	6	10	2,3,5	CO9	PSO4, PSO5, PSO6, PSO7, PSO8			
8	ISO 9000 concept and its importance. Documentation and implementation procedures of ISO 9000. Total Quality Management (TQM) and its importance. Implementation procedures of TQM.	9	15	2,3,5	CO1 0	PSO4, PSO5, PSO6, PSO7, PSO8			
9	Environmental protection act and its relevance of various. SA8000 and its role in quality management. OSHAS and its role in quality management. JIT system and its role in quality management.	6	10	2,3, 5	CO1 1	PSO4, PSO5, PSO6, PSO7, PSO8			
Reference Books:									
1.	NCUTE Publication Hiren Joshi and Gauri Joshi, Electronic Controls for Textile Machines.								

2.	Brochures/ Manuals of machine Manufacturers and other related publications
3.	Andrew Par , Industrial Control Hand Book
4.	Quality Planning and Analysis by J.M.Juran
5.	Quality Control and TQM by P.L.Jain
6.	G. Shanmmugam, T. Sivasantaran, D. Sarvanan NCUTE publications on Quality Control Technique.

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2019-20					
B.E. (Textile Technology): Regular Programme										
Year	III	Core / Elective / Foundation TXE1507: Textile testing - I	Credits / Hours per week				04(theory)			
Semester	I	Year of Introduction: 2004 Year of Revision: ---	Maximum Marks / Grade				100(theory)			
Mode of Transaction		Lectures & Tutorials								
Course Outcome (CO) TXE1507 CO1 Students gather knowledge of textile testing, statistical interpretations of the test data. CO2 Students learn about SQC and moisture relations in textile. CO3 Trash in cotton and its importance. CO4 Students gets detailed knowledge about fibre length. CO5 Students gets detailed knowledge about fibre fineness CO6 Students learn about fibre strength, its importance and measurement technique CO7 Students learn about yarn numbering system, its importance and measurement technique CO8 Students learn about twist in yarn , its importance and measurement technique CO9 Students should learn about modern textile testing instruments										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development	Relevance to Local (L)/ National (N)/ Regional(R)/ Global (G) development	Relation to Gender (G), Environment and Sustainability (ES), Human

							ment (SD)	pmenta l needs	n Values (HV)a nd Profess ional Ethics (PE)
1	Importance of textile testing in manufacturing process, Various aspects of fiber testing yarn testing & fabric testing, Need of statistical techniques & types of evaluation methods used for test data. Statistical methods for presenting data & analysis of data for average & dispersion behaviour. Concept of probability & its implementation in the evaluation of data following normal distribution. Significance testing, its importance in data interpretation, different techniques for significance testing of mean for small size & large size data: comparison of sample mean with nominal & comparison of means for two samples. Significance testing for dispersion, its importance in data interpretation, different techniques for significance testing of dispersion for small size & large size data: comparison of sample mean with nominal & comparison of means for two samples. Prediction about population mean & dispersion values using sample values for large size & small size data. Computation error in the prediction of population mean & dispersion. Analysis technique for test data following binomial distribution. Analysis technique for test data following Poisson distribution. Subjective analysis: grading technique with single judge & multiple judge,	12	20	1,2,3,4	CO1	PSO1, PSO2, PSO4, PSO6, PSO7, PSO8	EMP, SD	N, G	HV, PE

	Significance testing of graded values of sample, Coefficient of correlation for graded values.								
2	Importance / objective of testing and statistical quality control(SQC) in textile. Sampling and methods of sampling. Humidity and moisture relations in textile materials and their effect on testing and the corrections/standardizations required. Factors affecting regain. Effect of regain on fibre properties. The measurement of regain and its commercial importance.	12	20	1,2,3,4,5	CO2	PSO1, PSO2, PSO4, PSO6, PSO7, PSO8			
3	Importance of understanding trash in cotton in terms of level as well nature of trash. Measurement of Trash using various available instruments.	05	8.33	1,2,3,4,5	CO3	PSO1, PSO2, PSO4, PSO6, PSO7, PSO8			
4	Fibre length and length distribution. Staple length. Introduction to various other methods of length measurement. Cotton fibre length measurement – Single fibre length measurement. Statistical analysis of various graphs obtained from it. Fibrograph, Digital Fibrogram and Span Length.	06	10	1,2,3,4,5	CO4	PSO1, PSO2, PSO4, PSO6, PSO7, PSO8			
5	Fibre fineness and various methods of fineness measurements. Maturity of Fibres and its measurements, Identification of Textile Fibres.	04	6.67	1,2,3,4,5	CO5	PSO2, PSO4, PSO6, PSO7, PSO8			
6	Fiber strength testing: need & importance in textile manufacturing process, Concept of single fiber strength & its limitations, Concept of bundle fiber strength & its	06	10	1,2,3,4,5	CO6	PSO2, PSO4, PSO6,			

	importance in yarn manufacturing process, technique for Single fiber testing for man-made fiber & natural fiber, Important terms related with tensile testing. Pressley strength tester: Working principle, structural details of instrument, operational technique, limitations. Stelometer: Working principle, structural details of instrument, operational technique, How it overcomes limitations of Pressley strength tester, limitations of Stelometer. HVI testing: Working principle, operational technique & how it is superior in fiber strength testing.					PSO7, PSO8			
7	Significance of liner density measurement for yarn count computation, Yarn numbering system: definitions for direct & indirect system along with their merits & demerits, types of yarn numbering system & their mathematical form for computation. General formula for direct numbering & indirect yarn numbering system, derivation of specific general formulas for different form of materials during yarn manufacturing. Conversion formula, Derivation of Different conversion formulae for direct –direct, indirect- indirect & direct-indirect systems. Concept of Universal yarn numbering system & significance of tex system as Universal system, Need for yarn fineness measurement, Test method for yarn count measurement from short length of yarn or yarns availed from fabric piece. Types of wrap reel, Structural features of wrap reel, constrains of wrap reel-based yarn length measurement, Constrains	06	10	1,2,3,4,5	CO7	PSO2, PSO4, PSO6, PSO7, PSO8			

	for accurate weight measurement. Different balances used for weight measurement of yarn lea or skein prepared by wrap reel, Structure & Operating details of Quadrant balance, Associated advantages & disadvantages of the system. Structure & Operating details of Knowle's balance, Associated advantages & disadvantages of the system. Need for measuring yarn count from too short yarn lengths, Structure & Operating details of Yarn Assorting balance, Associated advantages & disadvantages of the system.								
8	Definition of twist, amount of twist, twist direction (type of twist), twist contraction, Derivation of expression for TM & TF, Significance of TM/TF in prediction about yarn twist value, Role of twist in determining yarn & fabric performance. Need for twist measurement, different methods used for twist measurement, Details of Rock bank twist tester operating on Straighten fiber method along with its merits & demerits. Concept of Take up, Details of Hand operated twist tester operating on fiber parallelization method, testing details for measuring twist properties of ply yarn & its constituent yarns by using take up twist tester, its merits & demerits. Importance of Bias twist testing, Details of Continuous twist tester operating on Straighten fiber method along with its merits & demerits. Details of Semi-automatic twist tester operating on twist contraction method along with its merits & demerits. Problems faced while twist measurement of unconventional spun yarn, Details of twist to break method in resolving this problem, Test method for Optical twist measurement along with its	06	10	1,2,3,4,5	CO8	PSO2, PSO4, PSO6, PSO7, PSO8			

	merits & demerits.								
9	Concept of Modern Textile Testing Equipment and a brief presentation about salient features of HVI & AFIS	03	05	5,6,7,8	CO9	PSO5, PSO6, PSO7, PSO8			
Reference Books									
1.	J. E. Booth : Principle of textile testing								
2.	Grover and Hambay : Hand book of textile testing and quality control								
3.	Angpappan, R. Gopal Krishna, B.K. Keshwan : Physical testing vol. I & II								
4.	W.S. Morton and Hearle : Physiacl properties textile fibres								



The Maharaja Sayajirao University of Baroda
Faculty Technology and Engineering
Department of Textile Engineering

Academic Year

2019-20

B.E. (Textile Technology) Regular Programme

Year	III	Core TXE1507L: Textile Testing-I Pract /TW/viva	Credits / Hours per week				04
Semester	I	Year of Introduction: 2004 Year of Revision:---	Maximum Marks / Grade				50
Mode of Transaction		Laboratory Experiments, discussion, term work and viva					
No.	Experiment		Contact hrs.	%Weightage	BT Level	CO	PSO
1.	Introduction and layout of laboratory		32	50	2,3,4,5	2,3,4,5,6	PSO1 PSO3 PSO4
2.	Fibre Testing						
	a) Standard Conditioning Oven						
	b) Shirley Trash analyzer						
	c) Comb Sorter						
	d) Star Moisture meter						
	e) Pressley Fibre Bundle Strength Tester						
	f) Fibro scan and Fibre Maturity Tester						
3.	Yarn testing		16	30	2,3,4,5	7,8	PSO1 PSO3 PSO4
	a) Count measurement by wrap reel and weighing method						
	b) Count measurement by Yarn quadrant balance						
	c) Rock bank Twist tester						
	d) Automatic Twist tester						
4.	Demo experiments		12	20	2,3,4,5	9	PSO1 PSO3 PSO4
	a) HVI, Fibre Identification						
	b) Stelometer Bundle Strength Tester						
	c) Chemical oven						
	d) Density gradient tube						

16.	Soxhlet apparatus					
17.	Melt flow index tester					
18.	Humidity oven					

 सत्यं शिवं सुन्दरं	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering	Academic Year	2019-20							
B.E. (Textile Technology): Regular Programme										
Year	III	Core / Elective / Foundation TXE1508: Fabric Structure	Credits / Hours per week					04		
Semester	I	Year of Introduction: 2004 Year of Syllabus Revision: ---	Maximum Marks / Grade					100		
Mode of Transaction		Lectures and Tutorials								
Course Outcome (CO) TXE1508 CO1 Learn about Fabric Classification and Characteristics of Different Fabric. CO2 Learn about the Concept of Weave, Representation of Design, Draft, Peg Plan (Lifting Plan), and Drawing-in and Denting Order and their inter relation. CO3 Understand the Plain, Twill, Satin and Sateen Weaves, Ornamentation and Derivatives of Plain, Twill, Satin and sateen Weaves. CO4 Understand the Diamond and Diaper weave, and its characteristics. CO5 Understand basics of Honey Comb, Huck-a-back, and Mock Leno Weaves. CO6 Understand basics of Distorted Thread Effect, Crepe, Bed ford Cords, and Welts and Pique Weaves.										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development	Relevance to Local (L)/ National (N)/ Regional (R)/ Global (G) development	Relation to Gender (G), Environment and Sustainability (ES), Human

							(SD)	I needs	Values (HV) and Professional Ethics (PE)
1	Introduction to Fabric Structure: Types and Classification of Fabric, Characteristics of Different Plain, Twill, and Satin and Sateen fabrics like, Plain Fabrics- Cambric, Poplin, Sheeting, Duck, Voile, Twill Fabrics- Jean, Denim, Gabardine, Satin and Sateen Fabrics- Cotton lining Sateen, Crepe Satin, Satin Drill, Satin Whipcord, etc.	08	13	1,2	CO1	PSO1 PSO2	Emp, Ent, SD	L,N,R, G	PE
2	Representation of Design: Draft, Peg Plan (Lifting Plan), and Drawing-in and Dentering Order and their inter relation.	06	10	1,2	CO2	PSO1 PSO1			
3	Plain weave: Characteristics of the Plain Weave, Ornamentation and Derivatives of Plain weave like Warp rib, Weft rib, and Hopsack/Basket/Matt Weaves.	08	14	1,2,4	CO3	PSO2 PSO3 PSO6 PSO8			
4	Twill weave: Characteristics of the Twill Weave, Derivatives of Twill weave like, Wavy Twill, Herringbone Twill, Broken Twill, Transposed or Re-arranged Twill, Elongated Twill, Combined twill, etc.	08	14	1,2,4	CO3	PSO2 PSO3 PSO6 PSO8			
5	Satin and Sateen Weaves: Characteristics of the Satin and Sateen Weaves, Derivatives in Satin and sateen Weaves like, Venetian and Buckskin, Swans down, Imperial Sateen, Reversible Sateen or Lambskin, Extension of Sateen weave, etc.	06	10	1,2,4	CO3	PSO2 PSO3 PSO6 PSO8			

6	Diamond and Diaper weave: and its characteristics, Difference between Diamond and Diaper Weaves. Study of the Bed Ford Cord weave, Different types of Producing Bed Ford Cord Weave. Like, Plain Faced, Twill Faced, Wadded Bed Ford Cord, Alternate Pick Bed ford Cord.	08	13	1,2,4	CO4, CO6	PSO2 PSO3 PSO6 PSO8			
7	Honey Comb Weave: Honey Comb with Square and Equal Cell, Brighton Honey Comb, Larger Honey Comb, Construction of Huck-a-back Weave, Devon's Huck, Grecian Huck-a-back and Construction of Mock Leno Weave.	08	13	1,2,4	CO5, CO6	PSO2 PSO3 PSO6 PSO8			
8	Study the Crepe Weave, Methods of the Construction of the Crepe weave. Construction of Distorted Thread Effect, Spot Effect, and Bedford cord weave	08	13	1,2,4	CO5, CO6	PSO2 PSO3 PSO6 PSO8			
Reference Books									
1.	Watson Textile Design and Colour, by Z. J. Grosecicki, WOODHEAD PUBLISHING LIMITED								
2.	Woven cloth construction by A. T. C. Robinson, R. Marks,								
3	Fabric Structure and Design by N. Gokarneshan, New Age International publishers								

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering				Academic Year		2019-20	
B.E. (Textile Technology): Regular Programme									
Year		III	Core / Elective / Foundation TXE1508L: Fabric Structure (Practical/TW/Viva)			Credits / Hours per week		04	
Semester		I	Year of Introduction: 2004 Year of Syllabus Revision: ---			Maximum Marks / Grade		50	
Mode of Transaction		Laboratory Experiments, discussion and viva			PSO7 is common for all experiments				
No.	Experiment				Contact hrs.	% weightage	BT Level	CO	PSO
1	Introduction: Parameters for Fabric Analysis				06	10%	1,2	CO1 CO2	PSO2 PSO7
2	Analysis of Sample-1				02	3.33%	2,4	CO3	PSO7 PSO8
3	Analysis of Sample-2				02	3.33%	2,4	CO3	PSO7 PSO8
4	Analysis of Sample-3				02	3.33%	2,4	CO3	PSO7 PSO8
5	Analysis of Sample-4				02	3.33%	2,4	CO3	PSO7 PSO8
6	Analysis of Sample-5				02	3.33%	2,4	CO3	PSO7 PSO8
7	Analysis of Sample-6				04	6.66%	2,4	CO3	PSO7 PSO8
8	Analysis of Sample-7				04	6.66%	2,4	CO4	PSO7 PSO8
9	Analysis of Sample-8				04	6.66%	2,4	CO4	PSO7

						PSO8
10	Analysis of Sample-9	04	6.66%	2,4	CO5	PSO7 PSO8
11	Analysis of Sample-10	04	6.66%	2,4	CO5	PSO7 PSO8
12	Making of Sample on Handloom	06	10%	1,2,3,6	CO3	PSO2 PSO3
13	Making of Sample on Handloom	06	10%	1,2,3,6	CO3	PSO2, PSO3
14	Making of Sample on Handloom	06	10%	1,2,3,6	CO3	PSO2, PSO3
15	Making of Sample on Handloom	06	10%	1,2,3,6	CO3	PSO2, PSO3

 THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA सत्यं शिवं सुन्दरम्		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year				2019-20			
B.E. (Textile Technology): Regular Programme											
Year	III	Core / Elective / Foundation Textile Chemistry - II TXC 1601		Credits / Hours per week				04			
Semester	II	Year of Introduction:1954 Year of Syllabus Revision: NA		Maximum Marks / Grade				100			
Mode of Transaction		Lectures									
Course Outcome (CO) TXC 1601 CO 1 Learning printing of various types of textiles. CO 2 Understanding difference of dyeing and printing. CO 3 Learning basic principle of printing and printing paste ingredients. CO 4 Learning different methods and styles of printing. CO 5 Learning printing of natural cellulosic fabric with different dyes. CO 6 Learning printing of natural protein fabric with different dyes. CO 7 Learning printing of man-made fabric with different dyes. CO 8 Understanding working principle of different printing machine. CO 9 Understanding development of color of printed fabric. CO10 Learning importance of finishing treatment. CO11 Leaning application of different finishing agents. CO12 Learning different finishing treatment applied on different textile fibres. CO13 Learning various types of mechanical finishing. CO14 Understanding working principle of various finishing machines.											
Unit No.	Topic/Unit			Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/	Relevance to Local (L)/ National (N)/	Relation to Gender (G), Environment and Sustainability

							Skill Development (SD)	Regional(R)/ Global (G) developmental needs	(ES), Human Values (HV) and Professional Ethics (PE)
1.	Introduction of Printing: • Definition and history of printing. • Difference between dyeing & printing. • Preparation of fabric for printing. • Printing paste ingredients and importance. • Thickener used in printing paste. • Different methods of printing. • Different styles of printing.	10	16.67	1,2,3	CO1, CO2, CO3, CO4	PSO1,2,3,4,5,6,7,8	Emp, Ent, SD	L, N, R, G	G, ES, HV, PE
2.	Printing of textiles: • Printing of cotton fabric with various dyes in different style of printing. • Printing of wool & silk fabric with various dyes in different style of printing • Printing of polyester fabric with various dyes in different style of printing. • Printing of nylon fabric with various dyes in different style of printing. • Printing of acrylic fabric. • Printing of blended fabric with various dyes. • Machinery used for printing. • Machinery used for development of colour on printed fabric.	20	33.33	1,2,3,4,5	CO5, CO6, CO7, CO8, CO9	PSO1,2,3,4,5,6,7,8			
3.	Introduction of Finishing: • Definition & Classification of Finishing. • Object of finishing. • Brief introduction of various finishing treatment for different fibres.	15	25	1,2,3,4,5	CO10 CO11 CO12	PSO1,2,3,4,5,6,7,8			

	• Temporary finishes applied on cotton fabrics – Starching, weighting etc. • Basic principle of crease-resistant finishing, water repellent and flame proofing. • Heat setting of synthetic fibre - fabrics and their blends.								
4.	Finishing Machineries: • Principle and working of padding mangles. • Different types of calender machines and its working principle. • Different types of drying machines. • Principle and working of stenter machine.	15	25	1,2,3,4,5	CO13 CO14	PSO1 ,2,3,4 ,5,6,7 ,8			
Reference Books									
1.	Technology of Printing – Prof. V. A. Shenai								
2.	Textile Finishing – Hall								
3.	Textile Finishing – J. T. Marsh								

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2019-20		
		B.E. (Textile Technology): Regular Programme						
Year	III	Core / Elective / Foundation TXC1601L: Textile Chemistry - II - Practical		Credits / Hours per week		02		
Semester	II	Year of Introduction:1954 Year of Syllabus Revision: NA		Maximum Marks / Grade		50		
Mode of Transaction		Term work, Practical and viva						
No.	Experiment			Contact hours	Weightage (%)	BT Level	CO	PSO
1.	Printing of cotton fabric with direct dye by direct style printing.			02	6.67	1,2,3,4,5,6	1,3,4,5,8,9	1,2,3,4,5,6,7,8
2.	Printing of cotton fabric with reactive dye by direct style printing.			02	6.67	1,2,3,4,5,6	1,3,4,5,8,9	1,2,3,4,5,6,7,8
3.	Printing of cotton fabric with reactive dye by discharge style of printing.			02	6.67	1,2,3,4,5,6	1,3,4,5,8,9	1,2,3,4,5,6,7,8
4.	Printing of cotton fabric with azoic colour – Naphthol printing method.			02	6.67	1,2,3,4,5,6	1,3,4,5,8,9	1,2,3,4,5,6,7,8
5.	Printing of cotton fabric with azoic colour – Base printing method.			02	6.67	1,2,3,4,5,6	1,3,4,5,8,9	1,2,3,4,5,6,7,8
6.	Printing of wool fabric with acid dye by direct style printing.			02	6.67	1,2,3,4,5,6	1,3,4,6,8,9	1,2,3,4,5,6,7,8
7.	Printing of polyester fabric with disperse dye by direct style printing.			02	6.67	1,2,3,4,5,6	1,3,4,7,8,9	1,2,3,4,5,6,7,8
8.	Printing of polyester fabric with disperse dye by discharge style of printing.			02	6.67	1,2,3,4,5,6	1,3,4,7,8,9	1,2,3,4,5,6,7,8
9.	Printing of nylon fabric with acid dye by direct style printing.			02	6.67	1,2,3,4,5,6	1,3,4,7,8,9	1,2,3,4,5,6,7,8
10.	Printing of jute fabric with basic dye by direct style of printing.			02	6.67	1,2,3,4,5,6	1,3,4,5,8,9	1,2,3,4,5,6,7,8
11.	Carbonized style of printing.			02	6.67	1,2,3,4,5,6	1,3,4,7,8,9	1,2,3,4,5,6,7,8
12.	Brasso style of printing.			02	6.67	1,2,3,4,5,6	1,3,4,7,8,9	1,2,3,4,5,6,7,8

13.	Application of stiffening agents of textile fabrics.	02	6.67	1,2,3,4,5,6	10,11,12,13,14	1,2,3,4,5,6,7,8
14.	Application of softening agent on textile fabrics.	02	6.67	1,2,3,4,5,6	10,11,12,13,14	1,2,3,4,5,6,7,8
15.	Application of crease resisting agents on textile fabrics.	02	6.67	1,2,3,4,5,6	10,11,12,13,14	1,2,3,4,5,6,7,8

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2020-21					
B. E. (Textile Technology): Regular Programme										
Year	III MECH	Core MEC 1608 INDUSTRIAL ENGINEERING AND OPERATION REASERCH	Credits / Hours per week				Lectures: 04 Practical:- NILL			
Semester	II	Year of Introduction: Year of Syllabus Revision: 2018	Maximum Marks / Grade				Theory: 100 PR/TW/VIVA: NILL			
Mode of Transaction: Lectures and Practical										
Course Outcome (CO) MEC 1608 CO1. Students will be able to describe characteristics and scope of OR. CO2. Students will be able to define and formulate mathematical problems. CO3. Students will be able to select optimal problems solving techniques for a given problem using LP. CO4. Students will be able to formulate and solve transportation, travelling sales man and transshipment problems. CO5. Students will be able to formulate and solve optimization problems related to job/ work assignments. CO6. Students will be able to demonstrate and solve simple models of Game theory. CO7. Students will be able to evaluate optimum solution using dynamic programming for different applications. CO8. Students will be able to choose / devise appropriate queuing model for practical application. CO9. Students will be able to solve different problems related to Network.										
Unit No.	Topic		Contact Hours	Weightage (%)	BT Level	CO	PO	Elements of Employabil ity (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevanc e to Local (L)/ National (N)/ Regional(R)/Global (G)	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV)and Professional Ethics (PE)

1	Linear programming techniques: Operation research and decision making, types of mathematical models and constructing the model, roll of computers in operations research, formulation of linear programming problem, applications and limitations, simplex method (analytical & graphical)	8	15	1,2,3	Co 1,2	Po1,2,3	All	All	All
2	Distribution Methods: Vogel's approximation methods, modified distribution method, optimization models, unbalance and degeneracy in transportation model.	8	15	1,2	Co 1,2,3	Po2			
3	Assignment Models: Hungarian algorithm, traveling sales man problem, routing problems, processing 'n' jobs through two machines and three machines, processing two jobs through 'm' machines.	8	15	2,3,4	Co 3,6	Po2,3,4			
4	Network Analysis: PERT and CPM. Total slack, free slack, probability of achieving completion date, cost analysis, updating resource smoothing – roll of computer in network analysis.	8	15	2,4,5	Co4,C O3 CO8	Po 4,3,1			
5	Inventory Method: Variable in inventory problem, inventory problem, inventory models with penalty, storage and quantity discount, safety stock, inventory models with probability, demand, multi item deterministic model.	8	10	1,2,3	CO5,C O3	PO2			
6	Queuing Theory: Poisson arrivals and exponential service times, waiting time and idle time cost, single channel multi channel problem, Monte Carlo technique applied to queuing problems, Poisson arrivals and service time.	3	10	3,5	CO5,C O5	PO3,5			
7	Decision Theory Game: Examples of the application of theory of games 2 x M and M x 2 problems, graphic dominance and linear programming method for different problems, decision trees.	3	10	4,2	C07	PO6			

8	Replacement Model: Replacement of item that deteriorate, gradually, fail suddenly. Group replacement policy. Concept of system reliability.	3	10	1,6	C06,7, 8	PO4,3,1			
		52	100						
Experiments									
	NILL								
Reference Books									
1.	Taha, H.A., “Operation Research”, Mc Millan Publicaiton Co. Inc, New York.								
2.	Hiller, F.S., Liberman, G.J., “Introduction to Operation Research 2 nd Edition”, Holden-Day Inc, San Francisco, 1974.								
3.	Rao S. S., “Optimization – Theory and applications”, Wiley Eastern, New Delhi, 1978.								
4.	Sesieni, M.A., Yaspan, A. and Friedman, L., “Operation Research: Methods and Problems”, John Wiley and Sons, New York 1959.								
5.	Wagner, N.B., “Principles of Operation Research”, NJ Prentice hall, 1975.								

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering	Academic Year					2019-20			
B.E. (Textile Technology): Regular Programme										
Year	III	Core / Elective / Foundation TXE1606: Textile testing - II	Credits / Hours per week					04(theory)		
Semester	II	Year of Introduction: 2004 Year of Syllabus Revision: ---	Maximum Marks / Grade					100(theory)		
Mode of Transaction		Lectures &Tutorials								
Course Outcome (CO) TXE1606 CO1 To understand evenness testing its importance, instrument and results obtained on them. CO2 To understand tensile instruments, principle and features. CO3 To understand physical properties of fabric testing, low stress mechanical properties like drape, crease so on. CO4 To understand permeability – air and water and special tests like flammability. CO5 Modern instrument details										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional(R)/ Global (G) developmental needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV) and

									Professional Ethics (PE)
1	Introduction to evenness testing, types of irregularities and numerical related to them, Visual assessment of yarn and grading	09	15%	1,2,3,4	CO1	PSO1, PSO2, PSO4, PSO6, PSO7, PSO8	EMP,SD	N,G	HV, PE
2	Yarn faults and imperfections, mechanical evenness tester and design considerations for capacitance-based instruments, UT2 and features of evenness instruments. Importance of diagram, spectrogram and LV curves	09	15%	2,3,4	CO1	PSO1, PSO2, PSO4, PSO6, PSO7, PSO8			
3	Introduction to tensile testing instruments, various principles and instruments based on them, draw-backs of pendulum lever instruments	06	10%	2, 3, 4	CO2	PSO1, PSO2, PSO4, PSO6, PSO7, PSO8			
4	Factors affecting results of tensile test, ballistic strength test and fabric tensile and tearing tests.	06	10%	1,2,3,4	CO2	PSO1, PSO2, PSO4, PSO6, PSO7, PSO8			
5	Introduction, fabric dimensions and properties. Ends per inch and picks per inch measurement. Width and length measurement of fabric. Measurement of fabric thickness. Fabric weight per unit area and its measurement.	09	15%	1,2,3,4	CO3	PSO1, PSO2, PSO4, PSO6, PSO7, PSO8			
6	Importance of yarn crimp, crimp & fabric properties and measurement yarn crimp. Handle of fabric. Drape of fabric. Relationship between yarn count, diameter and cloth cover and its calculations.	09	15%	2, 3, 4	CO3	PSO2, PSO4, PSO6, PSO7, PSO8			
7	Air permeability and its measurement. Crease resistance and crease recovery of fabric. Water repellency and flammability test of textile fabrics.	06	10%	2, 3, 4	CO4	PSO2, PSO4, PSO6,			

						PSO7, PSO8			
8	Kawabata Evaluation System of Fabric (KES-F). Fabric Assessment by Simple Test (FAST)	06	10%	5,6,7, 8	CO5	PSO5, PSO6, PSO7, PSO8			

Reference Books

1.	J. E. Booth	: Principle of textile testing
2.	Grover and Hambay	: Hand book of textile testing and quality control
3.	Angpappan, R. Gopal Krishna, B.K. Keshwan	: Physical testing vol. I & II
4.	W.S. Morton and Hearle	: Physiacl properties textile fibres

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering			Academic Year		2019-20		
B.E. (Textile Technology): Regular Programme									
Year	III	Core / Elective / Foundation TXE1606L: Textile Testing-II(Practical/TW/Viva)			Credits / Hours per week		04		
Semester	II	Year of Introduction: 2004 Year of Syllabus Revision: ---			Maximum Marks / Grade		50		
Mode of Transaction		Laboratory Experiments, discussion and viva			PSO7 is common for all experiments				
No.	Experiment				Contact hrs.	%Weightage	BT Level	CO	PSO
1	Yarn Testing: 1. Evenness Tester 2. Single yarn strength Tester 3. Lea yarn Strength Tester 4. Ballistic Strength Tester				16	27%	1,2,3,4	CO1 CO2	PSO1 PSO3 PSO4
2	Fabric Testing: 1. Fabric analysis 2. Fabric Tensile strength tester 3. Tearing strength tester 4. Crease recovery 5. Stiffness tester 6. Drape meter 7. Bursting strength tester 8. Air permeability Tester				40	67%	1,2,3,4	CO3 CO4	PSO1 PSO3 PSO4
3	Demo experiments: 1. Pilling tester 2. Water permeability Tester 3. Sieve shaker 4. Lloyd and Instron universal Testing machine				04	06%	1,2,3,4	CO1 CO4 CO5	PSO1 PSO3 PSO4

	5. Cone Dropper Tester					
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	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2019-20					
B.E. (Textile Technology): Regular Programme										
Year	III	Core / Elective / Foundation TXE1607: Spinning - II	Credits / Hours per week				04(theory)			
Semester	II	Year of Introduction: 2004 Year of Syllabus Revision: ---	Maximum Marks / Grade				100(theory)			
Mode of Transaction		Lectures & Tutorials								
Course Outcome (CO) TXE1607										
CO1 Understand the basic knowledge, constructional features and working principle of combing preparatory machines, comber, drawframe and speed-frame										
CO2 Learn about different mechanisms along with machine, process and product parameters for Comber, Drawframe and Flyerframe										
CO3 Role of combing process and Roving process in preparatory section of short staple spinning.										
CO4 Calculate draft, waste percentage, speed, twist and production of machines in each process.										
CO5 Instill fundamental and advanced technological changes took place in combing preparatory machines, comber, drawframe and speed frame										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional(R)/Global (G) development needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values

									(HV) and Professional Ethics (PE)
1	Principles and objects of Drawing. Effect of Doubling, Roller Setting. Irregularities due to drafting and remedies. Control for regularity. Modern Draw Frames.	06	12	1,2,3	CO1, CO2, CO5	PSO1	Emp, SD	L, N	ES
2	Objects., construction and working of speed frame, twisting, winding and builder mechanism. Twist, speed and setting to suit different material. Drafting system on speed frame.	08	13	1,2,5	CO1, CO2	PSO1			
3	Recent developments. Assessment of performance of draw frame, speed frame Productivity and modernization, process parameters.	08	12	1,2,4	CO1	PSO1, PSO2, PSO4			
4	Processing of man-made fibres and blends on speed frames. Maintenance schedule, work allocation, production balancing, calculations etc. on draw frames and speed frames Short- process Spinning.	08	13	1,2,3,4,5	CO3, CO4, CO5	PSO1			
5	Introduction to combing process, spinning process flow for yarn. Objectives of Combing, Effect of combing on yarn quality.	06	08	1,2,3	CO1, CO2, CO3	PSO1			
6	Sequence of operations in Combing Process: Combing cycle in detail, Importance of preparatory Processes for Combing, Technology of Combing, Material preparation, Parameters influencing combing operation, Factors associated with the machine, Combing applications, Noil extraction theory, Timing of comber.	08	14	1,2,3,4	CO1, CO2, CO3	PSO1, PSO2			
7	Conventional comber preparation system: web doubling system, Modern comber preparation system: sliver doubling system typically on Rieter E5/3 UNILAP and	08	14	1,2,3	CO1, CO3, CO5	PSO1			

	Rieter OMEGAlap E36, Lap transport system: SERVOfrolley and SERVOfap system.								
8	Modern Comber: Modifications and developments in basic comber process and machine parts. Performance assessment in combing.	08	14	1,2,3,4,5	CO3, CO5	PSO1, PSO2, POS4			

Reference Books

1.	Gilbert R.Merrill, Cotton combing
2.	Gilbert R. Merrill: Cotton drawing and roving
3.	Textile Institute manual of textile technology: a practical guide to Combing and Drawing: W. Klien, Vol -3 &4
4.	Textile Mathematics- Part I, II, III by J.E. Booth. Published by: Textile institute.1977
5.	Eric Oxtoby, Spun yarn Technology
6.	NCUTE Extension programme on “DRAWING AND COMBING & FLYER FRAME:”
7.	Text. Asso. of India, Spinning Tablets - (Comber, Drawframe and Speed frame)

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering				Academic Year		2019-20		
B.E. (Textile Technology) Regular Programme										
Year	III	Core / Elective / Foundation TXE1607L: Spinning - II Pract /TW/viva				Credits / Hours per week		04		
Semester	II	Year of Introduction: 2004 Year of Syllabus Revision: ---				Maximum Marks / Grade		50		
Mode of Transaction		Laboratory Experiments, discussion, term work and viva								
No.	Experiment					Contact hrs.	%Weightage	BT Level	CO	PSO
1	Conventional comber: Introduction to combing process, importance of preparatory machines, flow chart of the machine sequence for carded, combed and rotor yarn.					02	3	1,2	CO1	PSO1, PSO2
2	The passage of material on the machine. Understanding and tracing the combing cycle in detail. The features and functions of parts involved in combing cycle in detail.					02	3	1,2	CO1, CO2	
3	Tracing the gearing of combing machine. Calculation of speeds and delivery speeds of different parts of comber. Calculation of draft between different zones and overall combing machine viz. draft, total draft, draft constant, draft range, tension drafts etc. Calculation of production of the machine.					06	10	1,2,5	CO1, CO2, CO4	
4	Tracing and understand in detail the motion of nipper assembly (forward-backward and rocking)along with its associated parts, motion of detaching rollers (forward-backward and clockwise-anticlockwise-rocking) and motion of top-comb assembly (forward-backward and rocking) to understand the concept of net gain and calculate the net gain of material after one combing cycle.					06	10	1,2,5	CO1, CO2, CO4	
5	Lap former:Need of modernization in comber. The passage of material through lap former. The features and functions of parts at different zones along the passage. Salient features of modern lap former as compared to conventional lap preparatory machine. Study of different sensors: Importance of sensors and various setting points					06	10	1,2,3, 5	CO1, CO2, CO3, CO5	PSO1, PSO2, PSO4
6	Understanding the features and sequence of lap winding apparatus and automatic lap doffing system. Highlighting the lap transport system available in the lab					02	4	1,2,3	CO1, CO2,	

	(SERVOtrolley system)				CO5	
7	Modern comber: Comparison between modern and conventional comber machine through highlighting and understanding the various changes and development along its passage of the material through machine, technological and metallurgical changes in various parts in details and improvement in process phases for high speed comber.	06	10	1,2,3	CO1, CO2, CO5	
8	Conventional Draw frame: Passage of the material through machine and study of various parts in details. Study of creel zone, various types can arrangement system. Study of drafting zone, various types of top rollers, Various loading arrangement of top synthetic rollers.	02	3	1,2,3	CO1, CO2	PSO1, PSO2
9	Tracing of gearing plan of the drafting system and zone wise draft calculation, draft constant calculation and its practical application. Study of delivery zone, coiling arrangement, Tracing of gearing plan of the twisting mechanism and twist per inch calculation, twist constant calculation	04	7	1,2,3		
10	Tracing of gearing plan of the Conventional Draw frame and speed calculation of all rotating parts, Production calculation, Study of stop motions: Importance of stop motion and various setting points	02	3	1,2,3		
11	Modern Draw frame: Comparison between modern machine and conventional machine, Study of creel zone, Comparison between modern creel with conventional creel	02	4	1,2,4, 6	CO1, CO2, CO5	PSO1, PSO2, PSO4
12	Study of drafting zone, Importance of pressure bar, Comparison between modern drafting system with conventional drafting system. Tracing of gearing plan of the drafting system and zone wise draft calculation, draft constant calculation and its practical application.	04	7	1,2,4		
13	Study of delivery zone, Comparison between modern coiling arrangement with conventional coiling arrangement, Comparison of modern machine drive on modern machine and conventional machine. Tracing of gearing plan of the Modern Draw frame and speed calculation of all rotating parts, Production calculation	04	7	1,2,3		
14	Study of control panel, various limit switch, piston and solenoid valve and indicating bulb, Their location on machine and their function, study Automatic doffing system	02	3	1,2,5, 6		
15	Conventional Flyer frame: Passage of the material through machine and study of various parts in details. Study of creel zone. Tracing of gearing plan of the drafting	02	3	1,2		

	system and zone wise draft calculation, draft constant calculation and its practical application. Tracing of gearing plan of the twisting mechanism and twist per inch calculation, twist constant calculation and its practical application.					
16	Concept of types of wind, Study of builder mechanism on machine, Concept of flyer lead and bobbin lead machine, coils per inch calculation, Lay constant calculation and its practical application, Tracing of gearing plan of the flyer frame and speed calculation of all rotating parts, Production calculation. Study of stop motions: Importance of stop motion and various setting points	04	7	1,2,3	CO1, CO2	PSO1, PSO2
17	Modern Flyer frame: Comparison between modern machine and conventional machine, Passage of the material through machine and study of various parts in details.	02	3	1,2,4, 6	CO1, CO2, CO5	PSO1, PSO2. PSO4
18	Comparison between modern flyer and conventional flyer, Comparison between modern drafting system (TA drafting system) and drafting system. Various change point on machine. Maintenance of draw frame and flyer frame like draft roller setting etc.	02	3	1,2,5, 6	CO1	

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2019-20					
B.E. (Textile Technology): Regular Programme										
Year	III	Core / Elective / Foundation TXE1608 Weaving –II	Credits / Hours per week		04(theory)					
Semester	II	Year of Introduction: 2004 Year of Syllabus Revision: ---	Maximum Marks / Grade		100(theory)					
Mode of Transaction		Lectures & Tutorials								
Course Outcome (CO) TXE 1608 CO1 Understanding of fundamentals of dobby and jacquard shedding CO2 Fundamentals design preparation for dobby and jacquard CO3 Learn about principles and mechanism of different type of dobby and Jacquard CO4 Learn about important design features of modern developments in dobby and Jacquard CO5 Understanding and learning box motions on shuttle loom CO6 Understanding and learning different the mechanisms for terry weaving CO7 Solving typical problem related to setting requirements and Learn New design concepts										
Unit No.	Topic/Unit		Contact Hours	Weight age (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill	Relevance to Local (L)/ National (N)/ Regional (R)/ Global	Relation to Gender (G), Environment and Sustainability (ES), Human

							Develo p ment (SD)	(G) develo p mental needs	Values (HV)an d Professi on al Ethics (PE)
1	Limitations of cam shedding, introduction to dobby shedding	1	1.5	1,2	CO1	PSO 1 PSO 2	SD	G	ES
2	Climax dobby, construction and working Climax dobby drive, timing and setting in detail, pattern preparation	3	05	1,2, 3	CO1, CO2	PSO 1 PSO 2	SD	L	
3	Need for positive dobbies, construction and working of a positive dobby emphasising how it is a modification of a negative dobby Problem due to selection clearance in Climax dobby, Positive dobby with swivelling knives Introduction to Staubli negative dobby with short hooks, construction and working emphasising on reasons of its capability to run at high speeds Rotary dobbies - working principle, mechanical and electronic rotary dobbies, Modulator in a rotary dobby Dobbies with individual motor drive	21	35	1,2,3, 4,5,6	CO2, CO3, CO4 CO7	PSO 1 PSO 2 PSO 3 PSO 4 PSO 5 PSO 6 PSO 7 PSO 8	EMP, SD	N, G	

	Pattern control on dobbies – lag and peg control, punched sheet control (paper dobbies), electronic control Dobby mounting, shed settings Pick finding devices on dobbies								
5	Introduction to multiple box motions, construction of Eccles drop box motion Timing setting and pattern chain preparation of Eccles drop box motion Pick at will motions	2	3.5	1,2	CO5	PSO 1 PSO 2	EMP. SD	L	
6	Introduction to terry weaving – special mechanisms required to weave terry fabrics Terry weaving mechanisms on shuttle and shuttleless looms Introduction to sculptured terry, dynamic pile control, 5 pick and 7 pick terry structures Mechanism on a shuttleless loom for weaving of sculptured terry	3	5		CO6	PSO 2 PSO 3 PSO 4 PSO 6 PSO 7 PSO 8	EMP, SD	N, G	
7	Introduction to Jacquard concept, Classification of Jacquard Element of Jacquard with its function and construction of Hook, Needle, Harness, Comber Board, Cylinder, Design steps involve in manual card cutting and computerized card Cutting (CAD/CAM) ,Card detail, Piano card Cutting Machine, Electronically control piano card cutting machine	8	10	1,2,3, 5	CO1, CO2	PSO 1 , PSO 2 PSO 5, PSO 8	SD	L,R	
9	Mechanical Jacquards: Single lift Single cylinder, Double lift Single cylinder Jacquard and Double lift Double cylinder working, construction and drive,	7	12	1,2,3	CO3	PSO 3, POS 4	SD,E mp	L,R	

10	Double lift Single cylinder jacquard with Open shed, Verdol's fine pitch Jacquard, Shed geometry, Types of Harness ties, Loss in Lift, V shed geometry concept and related calculation	05	8	1,2	CO7	PSO 2	SD	L,R	
11	Electronic jacquard, Top and Bottom selection principle, Staubli jacquard: construction and working, development in hook designs, Bonas construction and working, Grosse Jacquard; construction, working and drive, Harnessless jacquard concept. Development in jacquard weaving reference to Industry 4.0.	10	20	1,2,5	CO4, CO7	PSO4, PSO 7	SD, Emp	N,G	
Reference Books:									
1.	Weaving II :NCUTE Publication								
2.	Weaving: Machines, Mechanisms, Management by Marinal Kanti Talukdar, P. K. Sriramulu,, Dinkar Bapurao Ajgaonkar								
3.	R. Marks and A. T. C. Robinson: Principles of weaving								
4.	Handbook of weaving: Sabit Adanur								
5.	Articles, Company Catalogs, brochures, web sites								

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering				Academic Year		2019-20		
B.E.(Textile Technology)Regular Programme									
Year	III	Core / Elective / Foundation TXE1608L Weaving –II (Practical/TW/Viva)			Credits / Hours per week		04		
Semester	II	Year of Introduction: 2004 Year of Syllabus Revision: ---			Maximum Marks / Grade		50		
Mode of Transaction		Laboratory Experiments, discussion, drawing, term work and viva							
No.	Experiment				Contact hrs.	%Weightage	BT Level	CO	PSO
1	Dobby : • Construction & Functions of different parts of Climax dobbie • Working & Drive to pattern cylinder & swiveling knives • Difference between Right Hand & Left hand dobbie in terms of working & construction • Pattern card formation & Timing of loom • Different Settings on loom in detail • Cam dobbie : Drive to cam, detail of hook selection mechanism, selector mechanism (paper dobbie)				20	33.37%	1,2,3	CO1 CO2	PSO 1 PSO 2
2	Multiple Box Motion: (Eccle’s Drop Box)& Terry Loom • Construction & Functions of different parts of Eccle’s Drop box motion • Working, Drive to discs, cylinder & pattern chain. Pattern chain preparation, Card saving device&Safety Mechanism • Introduction to terry, Different types of terry weave (3 pick, 5 pick etc.) • Mechanism of forming Terry loop structure, Function & working of three cams				10	16.63%	1,2,3	CO5, CO6	PSO 1 PSO 2
3	Jacquards • Input Device :Piano Card Cutting Machine • Elements of Jacquard, Classification of Jacquard, Types of Shed • Single lift and Double lift Jacquards: SLSC, SLDC, DLDC • Modern concepts and Electronic Jacquard				30	50%	1,2,3	CO1 CO2 CO6	PSO 1 PSO 2

 सत्यं शिवं सुन्दरम्	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering	Academic Year				2019-20				
B.E. (Textile Technology): Regular Programme										
Year	IV	Core / Elective / Foundation TXE 1701: Engineering of Textile Structures.	Credits / Hours per week				04(theory)			
Semester	I	Year of Introduction: 2005 Year of Syllabus Revision: ---	Maximum Marks / Grade				100(theory)			
Mode of Transaction		Lectures & Tutorials								
Course Outcome (CO) TXE 1701 CO1 Understanding the fundamentals of Textile Structures and its geometry. CO2 Learn about how geometrical properties of textile structures affect its physical properties. CO3 Solving typical problems of textile structures related to its geometrical properties. CO4 Designing cloth structures using standard rules.										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional (R)/ Global (G) developmental needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV) and

									Professional Ethics (PE)
1	Introduction to various textile structures with special reference to yarn, derivation of formula for yarn diameter (theoretical), experimental estimation of yarn diameter with merits and demerits of methods discussed by various researchers.	08	14%	1,2,3,4	CO1, CO3	PSO1, PSO2, PSO7, PSO8	EMP,SD	N,G	G, PE
2	Importance of twist in yarn structure, idealized yarn geometry and its derivation, twist contraction and retraction and related derivation.	08	13%	1,2,3,4	CO1, CO2	PSO1, PSO2, PSO7, PSO8			
3	Ideal fiber packing in yarn, contributing and disturbing factors	06	10%	1,2,3	CO1	PSO1			
4	Introduction to migration and techniques to measure it. Theoretical derivations to find migration based on research work of various researchers including zone wise distribution.	08	13%	1,2,3,4	CO2, CO3	PSO1, PSO2, PSO7, PSO8			
5	Important properties of Textile structures and comparison with other Engineering structures. Peirce’s fabric geometry	06	10%	1,2	CO1	PSO1, PSO4, SO8			
6	Definition of cover, weight, thickness, its relationship with textile structural parameters, with different conditions.	06	10%	2,3	CO2				
7	Derivation of equations for air space analysis, special geometrical conditions and solving numerical based on it.	09	15%	2, 3, 4,5	CO3	PSO1, PSO4, PSO8			
8	Structural design of cloth structures using standard	09	15%	3,4,5,6	CO4				

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2019-20					
B.E. (Textile Technology): Regular Programme										
Year	IV	Core / Elective / Foundation TXE 1702: Manmade Fiber Technology I	Credits / Hours per week				04(theory)			
Semester	I	Year of Introduction: 2005 Year of Syllabus Revision: ---	Maximum Marks / Grade				100(theory)			
Mode of Transaction		Lectures &Tutorials								
Course Outcome (CO) TXE 1702 CO1 Understanding need and basic concepts of manmade fiber manufacturing techniques CO2 Impart basic knowledge about role and design of manufactured fiber spinning techniques process and machine variables. CO3 Understanding the importance of post spinning operations. CO4 Knowledge about Parameters influencing Structure of Polymer CO5 Instill important aspects of manufacturing processes used for commercially successful manufactured fibers. CO6 Learning polymer manufacturing process CO7 Understanding the characteristics and applications of man-made fibres										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development	Relevance to Local (L)/ National (N)/ Regional(R)/Global (G) development	Relation to Gender (G), Environment and Sustainability (ES), Human

							(SD)	I needs	Values (HV) and Professional Ethics (PE)
1	Limitations of Natural Fibers and introduction to Man-made fibres, Classification of man-made fibres, Advantages and disadvantages of Man-made fibres. Nomenclature of Manufactured fiber.	01	2%	1, 2	CO1	PSO1, PSO4, PSO7 PSO8	EMP,SD	R,N,G	G,PE,ES
2	a) Concept of Filament & Staple Fiber; Classification: manufacturing technique based, chemical group based. b) Definitions: Polymerisation, Degree of polymerisation (DP), Glass transition temperature, Melting temperature, difference between regenerated and synthetic fibres c) Different Techniques of Fiber Formation Process: Concept of Condensation, Addition & Subtraction in the Production of Polymer. i. Solution Spinning Technique: Wet Spinning , Dry Spinning ii. Melt Spinning Technique	13	20%	2, 3, 4, 5	CO1 CO2 CO3				
3	Post Spinning Operations: Hot Drawing, Cold Drawing, Spin Finish Application, Heat Setting etc.- Brief about various techniques in use and their associated application fields	03	5%	2, 3, 4,5	CO3	PSO1, PSO4, PSO6 PSO8			
4	Parameters influencing Structure of Polymer : Concept of crystalline & amorphous regions in polymer	03	5%	2,3,4,5	CO1 CO2				

	structure, Quality parameters required for the polymer to be recognized as textile fiber. Their test methods.								
5	Machine Variables: Extruder, Spin box, Quenching chamber, Extruder bath , Spinneret etc for Dry spinning, wet Spinning & Melt Spinning Processes & their influence on the Polymer structure and properties. Basic concepts of Non woven fabric production techniques.	10	18%	1, 2,, 3, 4	CO1 CO2 CO3 CO4	PSO1, PSO2, PSO3, PSO5			
6	a) Manufacturing process of Viscose filament yarns along with its properties and applications. b) Chemistry of viscose rayon, Modern spinning baths, Role of zinc in spinning bath, Spinning with modifiers, diffusion boundaries during spinning, c) Polynosic rayon, spinning bath conditions and property details of different rayons,	9	15%	1,2,3,4 ,5	CO1, CO2, CO6, CO7				
7	a) Introduction to polyester (PET) polymer, b) PET polymer production thorough DMT and TPA routes: esterification and polycondensation process details, c) Important aspects to be considered in DMT and TPA routes, important factors which determines the polymer grade. d) PET filament spinning: Important aspects of batch process and continuous process	9	15%	1,2,3,4 ,5,6	CO2, CO6, CO7	PSO2, PSO4, PSO6, PSO7			
8	a) Introduction to Acrylic fibres, Production of acrylonitrile monomer, b) Production of acrylonitrile polymer: Mechanism of polymerization, types of polymerization. c) Characterization of polyacrylonitrile polymer, spinning of acrylic fibre through wet spinning,	6	10%	1,2,3,4 ,5	CO2, CO6, CO7				

	Typical example of acrylic fibre spinning in industry								
9	a) Introduction to Polypropylene fibre, problems with polypropylene fibre, b) Polymerisation: Monomer and polymer manufacturing, stereocity, catalyst system and its mechanism of working, c) Polypropylene filament characteristics: MFI, number average and weight average molecular weight, molecular weight distribution or polydispersity, effect of molecular weight on spinnability and fibre properties. d) Spinning processes of polypropylene: Short air quench melt spinning, long air quench melt spinning, spin draw process, spin draw texturising (BCF) process, water quench melt spinning process, tape yarn spinning process.	6	10%	1,2,3,4 ,5,6	CO1, CO2, CO6, CO7				
Reference Books									
1.	Manufactured Fibre Technology, V.K.Kothari&V.B.Gupta								
2.	Production of synthetic fibres, A.A. Vaidya								
3.	Manmade Fibres, R. W. Moncrieff								
4.	Textile Yarns, B.C.Goswami, J.G.Martindale and F.L.Scordioo (Wiley international)								
5.	Modern Yarn Production., G. R. Wary								
6.	Manmade fibres, NCUTE pilot programme, B.L.Deopura								
7.	Non Woven bonded fabrics, J. Lunenschloss and W.Albercht								

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2019-20					
B.E. (Textile Technology): Regular Programme										
Year	IV	Core / Elective / Foundation TXE 1703: Spinning - III	Credits / Hours per week				04(theory)			
Semester	I	Year of Introduction: 2005 Year of Syllabus Revision: ---	Maximum Marks / Grade				100(theory)			
Mode of Transaction		Lectures &Tutorials								
Course Outcome (CO) TXE 1703										
CO1 Understand different manufacturing steps followed in yarn formation process at Ring frame and Rotor.										
CO2 Learn about machine, and process and product parameters and their correlation for Ring spinning and Rotor Spinning										
CO3 Analyse impact of speed and setting changes of draft, twist, on process and product performance.										
CO4 In still fundamental and advanced technological changes took place in cotton yarn spinning processes.										
CO5 Impart basic knowledge about Fancy yarns as well as Doubled, Ply or Cord yarn production process and application areas.										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional(R)/ Global (G) developmental needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV) and

									Professional Ethics (PE)
1	Basic objective & Working of Ring frame, Skeleton Structure of Machine.	01	1%	1,2	CO1	PSO1, PSO4, PSO7 PSO8	EMP,SD	N,G	G, ES
2	Machine parameters: Creel: Type of creels, structural features and modification in the creel design to meet higher production rates without affecting quality. Drafting system Parameters: Design, dimensions and metallurgy of Bottom rollers, Top rollers, Top arm. Concept of Bonda waste & its collection system • Drive, maintainance & settings. • Draft calculus: Total draft, Actual draft, mechanical draft, DC, DCW, Break draft, BDC Twisting and Winding Parameters: Design, dimensions and metallurgy of Lappet guide, Spindle, Ring-Traveller, Bobbin • Their role in ring spinning, • cleaning and maintainance • Drive to the spindle, different methods and their merits-demerits. • Calculus: Twist, Twist constant, Delivery speed, Production rate, machine efficiency.	12	20%	2,3, 4,5	CO2				
3	Process Parameters: Types of package build & their importance, Builder mechanism • Traversing mechanism, • Advancing mechanism,	07	12%	2, 3,4,5	CO3	PSO1, PSO4, PSO6 PSO8			

	• Cop heel formation mechanism • Under winding mechanism. • Calculus: Lay constant, Coils/dt, winding coils: Binding coils Analyzed w.r.t. technological changes from classical to modern ring frame								
4	Automation: Need for automation, Auto Doffing, Automated cop transport, Link coner	01	2%	3, 6	CO4				
5	Factors influencing Spinning Performance: • Spinning Geometry: Design of machine parts and their settings, • Spinning Balloon: Theory and factors influencing balloon size and spinning stability. • Yarn tension: Theory & means for controlling yarn tension, • Traveller Limiting speed and means for increasing it: Development in the design features of Ring-Traveler.	09	15%	1, 2,3,6		PSO1, PSO2, PSO3, PSO5			
6	Limitations of Ring spinning in attaining higher production rate. Measures taken to overcome these limitations in Rotor spinning system	02	3%	1,2,4	CO1 CO2	PSO1			
7	• Rotor spinning process, Structural features of initial Rotor model (BD-200) Spin box, • Rotor Calculus: Twist and Production, Draft at various zones, Fiber Flux and number of doublings. • Limitations of first phase design of Rotor in meeting higher production rate, • Structural features of modern Rotor machine	06	10%	1,2,3,4	CO1 CO2 CO3 CO4	PSO1 PSO2 PSO3			

	Spin box								
8	- Fiber integration in Rotor yarn structure, - Concept of Peripheral Twist Extent (PTE) & its importance in determining Rotor yarn structure, - Mathematical relationship between Rotor speed (n) and Yarn arm speed (N) during fiber integration in yarn structure.	09	15%	2, 4, 5	CO2 CO4				
9	Design, drive and role of various machine and process variables on Rotor spun yarn quality and cost: - Opening roller, - Rotor, - Transport tube, - Naval tube, - Take up and Winding system - Arrangement of cleaning extracted residual trash and micro-dust at opening roller and Rotor, its influence on yarn quality. - Various designs of rotor groove and its importance in defining yarn quality. Properties of Rotor spun yarn and fabric Process control in Rotor Spinning : Machine variables, Material variables, Process variables	09	15%	2, 3, 5, 6	CO1 CO2 CO3 CO4	PSO1 PSO2 PSO4			
10	Yarn Doubling: - Need for doubling, - Types of doubled yarn, - Numbering of doubled yarn - Different methods of doubling: Ring doubling, TFO etc., Dry doubling, wet doubling etc. Fancy yarn, different production set ups used for the fancy yarn	04	7%	2, 3, 4, 6	CO5	PSO1 PSO2 PSO6			

Reference Books	
1.	Gilbert R.Merrill, Cotton Spinning
2.	Butterworth series, Manual of cotton spinning Vol- V
3.	W.Klein, A Practical Guide to Ring Spinning (Textile Institute vol 4 series)
4.	Textile Mathematics- Part I,II,III by J.E.Booth. Published by: Textile institute.1977
5.	Gilbert R.Merrill, Cotton Spinning
6.	R. Neild, Rotor Spinning
7.	Eric Oxtoby, Spun yarn Technology
8.	Salhotra K.R., Spinning of Man-Mades and blends on cotton spinning system
9.	Text. Asso. of India, Spinning Tablets - (Ring frame, doubling)
10.	M.E.I. Hand Book

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering				Academic Year		2019-20		
B.E. (Textile Technology) Regular Programme										
Year	IV	Core / Elective / Foundation TXE 1703L: Spinning – III Pract /TW/viva				Credits / Hours per week		04		
Semester	I	Year of Introduction: 2005 Year of Syllabus Revision: ---				Maximum Marks / Grade		50		
Mode of Transaction		Laboratory Experiments, discussion, term work and viva								
No.	Experiment					Contact hrs.	%Weightage	BT Level	CO	PSO
1	Introduction and Measurement of machine parameters like Total length of the machine, working length of the machine, Staff length, spindle gauge, drafting rollers diameters, Apron dimension, roller stand angle, spindle dimension, ring dimension, empty bobbin dimension etc.					04	6%	1,2, 3	CO1 CO2	PSO1, PSO2
2	Material flow on Ring frame, Design of Ring frame skeleton Structural & significance w.r.t. slow speed and high speed machine					02	2%	1,2	CO1	PSO1
3	Creel: Type, Structural design, Maintenance and Cleaning, Comparison of modern creel and conventional creel					02	3.0%	2,3,4, 5	CO1 CO2	PSO1, PSO2
4	Drafting System: Types, Design features of Drafting system variables and their measures, Mounting on Skeleton structure, Associated Settings, Maintainace and cleaning, Waste evacuation system					08	15%	2,3,4, 5	CO1 CO2	PSO1, PSO4
5	Drive to bottom drafting rollers, Calculus: Draft, DC, Draft range, Delivery speed, Production/ unit time, Doffing frequency – Study w.r.t. slow speed and High speed RF.					04	7%	2,3,4, 5	CO2 CO4	PSO2, PSO3
6	Twisting Mechanism: Design features of Lappet guide, Ring-traveller, bobbin & Spindle, Measurement of variables affecting twist transfer: Front roller over hang, Roller stand angle, Spinning angle, Associated Settings, Maintenance and cleaning- – Study w.r.t. slow speed and High-speed RF.					06	12%	2,3,4, 5	CO2 CO3 CO4	PSO2, PSO3, PSO4
7	Tracing Twist gearing and associated calculus: TPI, TC, Twist range, Twist direction					02	4%	2,3,4,	CO2	PSO2,

	and arrangement for changing twist direction, Variation in twist throughout the doff, Associated Settings, maintenance & cleaning – Study w.r.t. slow speed and High speed RF.			5	CO3 CO4	PSO3, PSO4
8	Winding Mechanism: Design features of machine variables and their measures, Associated settings, Maintenance and cleaning, Calculations: Winding speed & its variation due to change in bobbin diameter, Winding on angle – Study w.r.t. slow speed and High-speed RF.	04	7%	4,5,6	CO2 CO3 CO4	PSO2, PSO3, PSO4
9	Builder Mechanism: Study of Traversing, Advancement, Cop heel, Shoulder heel, Under winding and On winding sequence on machine mechanisms and their settings to deal with different count range done w.r.t. slow speed and High speed RF.	10	14%	2,3,4, 5	CO1 CO2 CO3	PSO1, PSO2, PSO3, PSO4
10	Concept of constant tension spinning: Different methods of controlling spinning tension; Dual speed drive and variable speed drive.	02	4%	2,3,4, 5	CO1 CO2 CO4	PSO2, PSO3, PSO4
11	Calculations for Builder motion: Lay gearing and calculation for coil density and its variations w.r.t. doff position, Winding coil: Binding coil and their significance	02	4%	2,3,4, 5	CO1 CO2 CO4	PSO2, PSO3, PSO4
12	Material flow on Rotor, Study for Design features and measures of Rotor machine variables & significance w.r.t. slow speed and high-speed machine	06	10%	2,3,4, 5	CO2 CO3	PSO1, PSO2, PSO3
13	Rotor Calculus: Draft and fiber flux present at various zone, Delivery speed & Production per unit time, Associated Settings, maintenance & cleaning	02	4%	4,5,6	CO2 CO4	PSO2, PSO3, PSO4
14	Material flow on T.F.O., Study for structural and design features of machines parts. Measures of T.F.O. machine variables w.r.t. processing of cotton, blend and man-made yarns.	04	6%	2,3,4, 5	CO1 CO5	PSO1, PSO2, PSO4
15	Calculations for T.F.O.: TPI, TC, Twist range, Delivery rate, Production per unit time	02	2%	2,3,4, 5	CO4 CO5	PSO1, PSO2, PSO4

 सत्यं शिवं सुन्दरम्	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year				2019-20			
B.E. (Textile Technology): Regular Programme										
Year	IV	Core / Elective / Foundation TXE1704 Weaving III	Credits / Hours per week				04(theory)			
Semester	I	Year of Introduction: 2005 Year of Syllabus Revision: ---	Maximum Marks / Grade				100(theory)			
Mode of Transaction		Lectures & Tutorials								
Course Outcome (CO) TXE 1704										
CO1 Understanding of fundamentals of modern weaving machine										
CO2 Fundamentals design concept of automatic and shuttle less loom										
CO3 Learn about principles and mechanism of different type automatic and shuttle less loom										
CO4 Learn about important design features of modern developments										
CO5 Solving typical problem related to setting requirements and Learn New design concepts										
Unit No.	Topic/Unit		Contact Hours	Weight age (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development	Relevance to Local (L)/ National (N)/ Regional (R)/ Global (G)	Relation to Gender (G), Environment and Sustainability (ES), Human Values

							ment (SD)	develo p mental needs	(HV)an d Professi on al Ethics (PE)
1	Introduction to Automatic shuttle looms & their classification; Weft feelers on automatic looms – classification, midget feeler working, settings Plunger type feeler, depth feelers, two prong electric weft feeler, electronic weft feeler; Shuttles and pirns of Cop changing mechanism, Cop changing mechanism construction and working; Timing and settings of cop changing mechanism; Weft cutters on cop changing automatic looms; Various practical aspects related to cop changing mechanism such as various fabric faults caused due to malfunctioning of cop changing mechanism and weft cutters; Stop type of shuttle changing mechanism, construction and working; Non-stop type of shuttle changing mechanism	7	11.67	1,2,3	CO1 CO2	PSO 1 PSO 2 PSO 3 PSO 4 PSO 7 PSO 8	SD	R, N	ES
2	Introduction to projectile looms, Salient features of Sulzer projectile looms, its weaving cycle, picking mechanism, beat up motion, details of various picking elements, their functions, construction, selvedge formation, projectile flight control	10	16.67	1,2,3,4 ,5,6	CO3 CO4	PSO 1 PSO 2 PSO 3 PSO 4 PSO 5 PSO 6 PSO 7 PSO 8	Emp, Ent, SD	R, N, G	
3	Introduction to rapier looms, Classification of rapier looms, picking cycle of different rapier looms, rapier	13	21.66	1,2,3,4 ,5.6	CO5	PSO 1 PSO 2	Emp,	R, N,	

	gripper construction, important elements of rapier weaving, weft tension control, positive and negative rapiers, free flight rapiers, rapier driving mechanisms					PSO 3 PSO 4 PSO 5 PSO 6 PSO 7 PSO 8	Ent, SD	G	
4	Introduction to Air jet loom, Different weft insertion system like Single nozzle and multiple nozzle system, Detail of different parts like accumulator, Nozzle geometry, confuser, Profile reed, sub nozzle and stretch nozzle. Step Graph for sub nozzle sequential operation.	12	20	2,3,4	CO2, CO3, CO4	PSO 1 PSO 2 PSO 3 PSO 4 PSO 5 PSO 6 PSO 7	Emp, Ent, SD	R,N, G	
5	Introduction to Water jet loom, Detail of different parts like accumulator, Nozzle geometry, Pump. Development in new water jet machine. Positive, Crank and E shedding concept, 4link-6link beat up in air jet and water jet, other new concept and engineering aspect for technical yarn weaving	12	20	2,3,4	CO2, CO3, CO4				
6	Classification of Let off, Concept, Limitations of negative let off motions, Semi positive and Positive let off motions, E let-off	06	10	2,3,4,5	CO2, CO3, CO5				
Reference Books:									
1.	Handbook of Weaving by <u>Sabit Adanur</u> , CRC Press, 2001								
2.	Weaving: Machines, Mechanisms, Management by Marinal Kanti Talukdar, P. K. Sriramulu,, Dinkar Bapurao Ajgaonkar, Mahajan Publishers, 1998								
3.	Shuttleless weaving: Talavasek, Svaty, Textile Science and Technology 1981								
4.	Principles of Weaving, Marks, Robinson, Textile Institute, 1976								
5.	Company Catalogs, brochures, patent literature								

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering			Academic Year		2019-20		
B.E. (Textile Technology) Regular Programme									
Year		IV	Core / Elective / Foundation TXE 1704L: Weaving-III Lab (Practical/TW/Viva)			Credits / Hours per week		04	
Semester		I	Year of Introduction: 2005 Year of Syllabus Revision: ---			Maximum Marks / Grade		50	
Mode of Transaction		Laboratory Experiments, discussion, drawing, term work and viva							
No.	Experiment				Contact hrs.	%Weightage	BT Level	CO	PSO
1	Automatic Loom: 1. Study of warp stop and center weft fork motions on an automatic shuttle loom 2. Study of cop changing mechanism on a 4x1 cop changing automatic loom 3. Study of warp stop and center weft fork motions on an automatic shuttle loom				15	25	1,2,3,4	CO3, CO4, CO5	PSO1, PSO2, PSO3, PSO4, PSO5, PSO6
2	Automatic shuttle loom: Construction, working, settings, technical drawing and measurement/calculations of various parameters of following mechanism on the Automatic shuttle loom. 1. Measurements of various parameters of different types of shuttles and pirns used for auto and non-auto shuttle looms. 2. Study of Cop changing mechanism 3. Study of Weft cutters on cop changing automatic looms 4. Study of Bartlett and Roper type of let-off motions 5. Study of mechanical warp stop motion 6. Study of stern's parallel picking motion				15	25	1,2,3,4	CO 3 CO 4 CO 5	PSO1, PSO2, PSO3, PSO4, PSO5, PSO6
3	Airjet loom: Introduction to shuttleless loom, different insertion system, Passage, function of				15	25	1,2,3,4	CO 3 CO4	PSO1, PSO2,

	different parts, Insertion concept and design, shedding, beat up, Let off comparison with modern machines				CO5	PSO6
4	Water jet: 1. Water jet loom: Introduction, Passage of warp and weft through waterjet loom 2. Drive to different mechanisms of water jet loom 3. Shedding mechanism, Beat up mechanism, Pump, Suction device 4. Study of the timing of water jet loom 5. Study of different selvedge mechanisms like dummy and twisted selvedge, Important settings of loom	10	17	1,2,3,4	CO 3 CO4 CO5	PSO1, PSO2, PSO6
5	Rapier Loom Rapier Loom: Introduction, Passage of warp and weft through rapier loom Drive to rapier, study of speed change of rapier in a pick cycle. Preparation and insertion of weft pattern chain and running of rapier loom	05	8	1,2,3,4	CO 3 CO4 CO5	

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2019-20					
B.E. (Textile Technology): Regular Programme										
Year	IV	Core /-Elective/ Foundation TXE1706 Yarn Preparation - II	Credits / Hours per week		04(theory)					
Semester	I	Year of Introduction: 2005 Year of Syllabus Revision: ---	Maximum Marks / Grade		100(theory)					
Mode of Transaction		Lectures & Tutorials								
Course Outcome (CO) TXE 1706 CO1 Understanding the basics of warp sizing and automatic winding machines CO2 Understanding developmental stages of automatic winding machines CO3 Learning different automatic winding technologies and systems. CO4 Learning recent developments in yarn splicing and clearing CO5 Learning about important machine parts of sizing machine along with their modern counterparts CO6 Understanding sizing techniques and calculation related to sizing process										
Unit No.	Topic/Unit		Contact Hours	Weight age (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill	Relevance to Local (L)/ National (N)/ Regional (R)/ Global	Relation to Gender (G), Environment and Sustainability (ES), Human

							Develo p ment (SD)	(G) develo p mental needs	Values (HV)an d Professi on al Ethics (PE)
1	Introduction to automatic winding machines, classification of automatic winding machines, Large group winding machines, Small group automatic winding machine Introduction, passage of yarn through winding machine – typically on machines like Autoconer 107, Autoconer 138, Functions of elements in passage, drum drive, various features that leads to improved package quality like individual drum drive, lap guard, package weight compensation, motorised tension device, drum displacement, lifting of package instantaneously in event of yarn breakage and drum brake, knotter, elements and working of knotter/ knotting cycle, electronic knotter carriage control, package doffer	06	12.5	1, 2, 3, 4, 6	CO1 CO2 CO3	PSO 1 PSO 2 PSO 3 PSO 6	Emp, SD	L, R, N	ES
2	Winders with individual knotter/ splicer on each head Introduction, passage of yarn through winding machine – like Schlafhorst series of winders Autoconer 238, Autoconer 338, Autoconer 5, PreciFX winding system, Savio series of winders such as Espero, Orion, Multicone, Murata range of machines (Machconer	16	22.5	1, 2, 3, 4, 5, 6	CO3	PSO 1 PSO 2 PSO 3 PSO 4 PSO 5 PSO 6	Emp, Ent, SD	L, R, N, G	

	series , ...QPRO, FPRO) stages of development and additional features over small group winding machines aimed at improving package quality, productivity, energy consumption reduction such as – Individual motor drive to drum, advancement in drive, Autospeed (AC 238), Quality cut, Quality guard, ATT drive, Autotense, Balcon, Speedster, Booster, Tension Manager, AVC feature, Upper yarn sensor, Propack FX, Ecopack FX, Variopack FX, Anti-patterning with multi-grooved drums, Suck back facility, Drumless traverse technologies, New package formats with drumless traverse								
3	Modern electronic yarn clearing systems Range of yarn faults, distinction between objectionable and allowable yarn faults, sensors for fault detection, action by yarn clearing systems at yarn faults, yarn fault classification systems, channels for basic yarn clearing, channels for additional yarn clearing	5	10	1, 2, 3, 4, 6	CO4	PSO 1 PSO 2 PSO 3 PSO 4 PSO 6 PSO 7	Emp, SD	L, R, N, G	
4	Knotless yarn joining Various means for knotless yarn joining, splicing, electrostatic, mechanical and pneumatic splicing, pneumatic splicing cycle, optimum opening, opening tubes, parameters related to opening, vortexing chamber, various vortexing chambers, parameters related to vortexing and their optimisation, splice joint evaluation, mechanical splicing (Savio Twin splicer)	3	5	1, 2, 3, 4, 5, 6	CO4	PSO 1 PSO 2 PSO 3 PSO 4 PSO 6	Emp, SD	L, R, N, G	

5	Introduction to sizing and importance its types, description of two cylinder slasher sizing machine, leasing and splitting. Various types of creels used on sizing machines.	06	8%	1,2	CO1 CO5	PSO1, PSO2	Emp, SD	L, R, N, G	HV, PE
6	Design and construction of conventional size box, its drawbacks and how they are overcome in the modern size boxes. Various types of temperature and level controls provided on size boxes. Important terms related to sizing. Factors affecting the size pick-up including the size box and machine variables.	10	20%	1,2,3, 5	CO1 CO5 CO6	PSO1, PSO2, PSO3, PSO4	Emp, SD	L, R, N, G	HV, PE
7.	Importance of warp sheet drying, methods, mechanism of drying, quantity of water to be evaporated, drawbacks of two cylinder drying and introduction to multi-cylinder drying with its merits and demerits. Concept of single end sizing. Drive, tension zones and sizing calculations.	10	15%	1,2,3, 4,5	CO1 CO5 CO6	PSO1, PSO2, PSO3, PSO4, PSO8	Emp, SD	L, R, N, G	HV, PE
8.	New developments in sizing	04	7%	1,2,4	CO6	PSO4	Emp, SD	L, R, N, G	HV, PE

Reference Books:

1.	Fundamentals of yarn winding by MilindKoranne, published by Woodhead publishing 2013
2.	D. B. Ajgaonkar: Sizing machines, methods and materials
3.	BTRA: warping and sizing
4.	J.B.Smith: Warp sizing technology
5.	Company web sites, Schlafhorst documentations, brochures

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering				Academic Year		2019-20		
B.E. (Textile Technology) Regular Programme										
Year	IV	Core / Elective / Foundation TXE 1706L: Yarn Preparation II Pract /TW/viva				Credits / Hours per week		04		
Semester	I	Year of Introduction: 2005 Year of Syllabus Revision: ---				Maximum Marks / Grade		50		
Mode of Transaction		Laboratory Experiments, discussion, term work and viva								
No.	Experiment					Contact hrs.	%Weightage	BT Level	CO	PSO
1	Introduction to the concept of sizing, passage of material on two-cylinder slasher sizing machine along with concept of leasing and dry splitting, features and functions of elements in passage.					02	4.16	1,2	CO1	PSO1, PSO2
2	Creel: Type, Structural design, creel setting, Advantages and disadvantages of horizontal creel as compared to others.					02	4.16	1,2	CO1	PSO1, PSO2
3	Basic features of the conventional size box including the design and structural features of every part of size box in detail, height setting of Immersion roller, Loading and unloading of squeeze roller.					02	4.16	1,2,3	CO1	PSO1, PSO2
4	Construction of cylinder, steam supply line in detail, different types of steam valves along the steam passage, scooping arrangement, steam trap arrangement, doll head bearing and bourdon pressure gauge.					04	8.33	1,2,3	CO1	PSO1, PSO2
5	Tracing the gearing of drive for slow and normal speed. Calculation of speed of various rollers. Delivery speed, production, measuring and marking calculations for length of cloth.					04	4.16	2,4,5	CO1	PSO2, PSO3
6	Beam winding mechanism including the working of friction clutch and beam pressing device.					04	4.16	2,3,4	CO1	PSO2, PSO3
7	Passage of material on automatic pirn winding machine. Features and functions of elements in passage. Tracing the drive to pirn and transverse cam.					02	4.16	1,2	CO1	PSO1, PSO2
8	Understanding the pirn builder mechanism by tracing and understanding the					06	8.33	1,2,3	CO1	PSO2,

	traversing, traverse within traverse, advancement, bunching (layer locking device) and full pirn stop mechanism.					PSO3
9	Tracing and understand the thread stop motion. Trace and understand the various steps involved in automatic pirn changing mechanism.	04	8.33	1,2	CO1	PSO1, PSO2
10	Drawback of Non-Automatic winding machine. Features of Automatic winding machine. Passage of yarn on Autoconer X5 and function of its different parts.	02	4.16	1,2	CO1	PSO1,PSO 2
11	Startup of the X5 machine. Emergency switch. Winding unit Display. Drive to different parts. Sequence of yarn in case of yarn break and empty bobbin change. Sequence of Splicing and different type of Spicing.	08	12.48	1,2,3	CO2 ,CO 4	PSO1,PSO 4
12	Describe in detail about ATT, Auto tense control, Vaccum system, Dust extraction, Propack, Standard package cradle, Package brake, Yarn guide drum.	08	12.48	1,23	CO3	PSO2, PSO4
13	Describe in detail about the Informator	06	12.48	1,2,3	CO3	PSO1,PSO 4
14	Describe in detail about the Loepfe yarn master Zenit Clearer	06	8.33	1,2,4	CO4	PSO2, PSO4

 सत्यं शिवं सुन्दरम्	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year	2019-20
B.E. (Textile Technology): Regular Programme				
Year	IV	Core / Elective / Foundation TXE1801 Advanced fabric structure (elective)	Credits / Hours per week	04(theory)
Semester	II	Year of Introduction: 2005 Year of Syllabus Revision: ---	Maximum Marks / Grade	100(theory)
Mode of Transaction		Lectures & Tutorials		
Course Outcome (CO) TXE 1801 CO1 Introduction to different compound structures CO2 Understanding Stripe and check weave combinations CO3 Understanding Colour and weave effects CO4 Understanding Backed cloth structures CO5 Understanding various double cloth structures CO6 Understanding multi-layer fabric constructions CO7 Understanding face to face weaving CO8 Understanding Terry Structure CO9 Understanding weft pile fabric CO10Understanding figuring with extra threads CO11Understanding Gauze and Leno weave CO12 Understanding Jacquard Designing				

Unit No.	Topic/Unit	Contact Hours	Weightage (%)	BT Level	CO	PSO	Element s of Employa bility (Emp)/ Entrepre neurship (Ent)/ Skill Develop ment (SD)	Relevan ce to Local (L)/ National (N)/ Regional (R)/Glob al (G) develop mental needs	Relation to Gender (G), Environme nt and Sustainabil ity (ES), Human Values (HV)and Profession al Ethics (PE)
1	Introduction to colour and weave effects, representation of colour and weave effects, verities of colour and weave effects produced in same weave and colour order Simple colour and weave effects, stripe and check colour and weave effects	4	6	1,2,3, 4,5,6	CO1 CO3	PSO 1 PSO 2 PSO 4 PSO 6 PSO 8	Emp/ SD	L, N, R, G	-
2	Introduction to stripe and check weave combinations, forms of stripe and check weave combinations, selection of suitable weaves Various designs for stripe and check weave combinations	4	6	1,2,3, 4,5,6	CO2	PSO 1 PSO 2 PSO 4 PSO 6 PSO 8	Emp/ SD	L, N, R, G	
3	Introduction to backed cloths, classification of backed cloths, principle of construction of backed cloth designs, Reversible weft backed	4	8	1,2,3, 4,5,6	CO4	PSO 1 PSO 2 PSO 4	Emp/ SD	L. N. R. G	

	cloths, methods of weft backing standard weaves, Wadded backed cloths, comparison of warp backed and weft backed structures					PSO 6 PSO 8			
4	Classification of double cloths, principle of construction of a double cloth structure Self stitched double cloths, selection of a suitable stitch position Centre stitched double cloths Wadded double cloths	7	10	1,2,3, 4,5,6	CO5	PSO 1 PSO 2 PSO 4 PSO 6 PSO 7 PSO 8	Emp/ SD	L, N, R, G	
5	Introduction to interchanging double cloths, Hairlines in interchanging double cloth, Various designs for hairlines in interchanging double plain cloths Mixed colour effects in interchanging double cloths, Producing motifs in interchanging double cloths	6	10	1,2,3, 4,5,6	CO5	PSO 1 PSO 2 PSO 4 PSO 6 PSO 7 PSO 8	Emp/ SD	L. N. R. G	
6	Multilayer fabrics – introduction, construction of stitched treble cloths	3	4	1,2,3, 4,5,6	CO6	PSO 1 PSO 2 PSO 4 PSO 6 PSO 7 PSO 8	Emp/ SD	L, N, R, G	
7	Face to face weaving – introduction, loom elements for face to face weaving, Special features of looms for face to face weaving Designs of various face to face weaving structures	2	6	1,2,3, 4,5,6	CO7	PSO 1 PSO 2 PSO 4 PSO 6 PSO 8	Emp/ SD	L, N, R, G	

8	Introduction to terry fabric Formation of Terry Pile, Terry weave, Principle of loop formation, Special mechanism required in Terry Weaving, Terry Ornamentations.	6	12	1,2,3, 4,5,6	CO8	PSO 1 PSO 2 PSO 4 PSO 6 PSO 7 PSO 8	Emp/ SD	L, N, R, G	
9	Weft pile fabric Construction of weft pile fabric, Classification of weft pile fabrics, All over or plain velveteens, Plain back velveteen, Twill back velveteen, Length and density of pile, Corded velveteen, Plain back corduroy, Twill back corduroy.	7	12	1,2,3, 4,5,6	CO9	PSO 1 PSO 2 PSO 4 PSO 6 PSO 7 PSO 8	Emp/ SD	L, N, R, G	
10	Figuring with extra threads Principle, Methods of introducing extra figuring threads, Extra warp figuring, Extra Weft figuring	5	8	1,2,3, 4,5,6	CO10	PSO 1 PSO 2 PSO 4 PSO 6 PSO 7 PSO 8	Emp/ SD	L, N, R, G	
11	Gauze and leno weave Principle of leno structure, Basic sheds of leno weaving, leno weaving with flat steel doup with an eye, leno weaving with flat steel slotted doup, Easing motion, Simple net leno, Russian cord	8	12	1,2,3, 4,5,6	CO11	PSO 1 PSO 2 PSO 4 PSO 6 PSO 7 PSO 8	Emp/ SD	L, N, R, G	
12	Jacquard designing (development of figure, insertion of ground weave) and Designing	4	6	1,2,3, 4,5,6	CO12	PSO 1 PSO 2	Emp/ Ent/ SD	L, N, R, G	

	software					PSO 4 PSO 6 PSO 7 PSO 8			
Reference Books:									
1.	Z. J. Grosiski	: Watson's Textile Design And Colour, Woodhead publishing series in Textiles							
2.	Z. J. Grosiski	: Watson's Advanced Textile Design, Woodhead publishing series in Textiles							

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering	Academic Year	2019-20							
B.E. (Textile Technology): Regular Programme										
Year	IV	Core / Elective / Foundation TXE 1803: Garment Technology	Credits / Hours per week					04(theory)		
Semester	II	Year of Introduction: 2005 Year of Syllabus Revision: ---	Maximum Marks / Grade					100(theory)		
Mode of Transaction		Lectures &Tutorials								
Course Outcome (CO) TXE 1803 CO1 Imparting knowledge about different operations along with constrains involved in Readymade Garment Industry. CO2 Understanding concept of grading to switch over from one size to another with due precision. CO3 Building fundamental base required for the marker planning to reduce fabric waste. CO4 Evaluating position of Indian and global garment manufacturing scenario using SWOT analysis. CO5 Understanding the branding strategy and its impact on profitability for a garment manufacturing operation. CO6 Instill concept of retailing, marketing and merchandizing. CO7 Understanding modern concept like e-retailing, e-merchandising										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional(R)/Global (G) development needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values

									(HV) and Professional Ethics (PE)
1	Introduction: Definition of Garment, Difference between tailor made garment manufacturing & Readymade garment manufacturing industry, Different steps involved in bulk garment manufacturing.	02	3.33%	1, 2	CO1	PSO1, PSO4, PSO7 PSO8	EMP, ENT, SD	L, N,G	G, ES
2	Design studio: Planning of a particular type/sort of garment manufacturing, Importance of fabric properties and selection fabric for garment production.	04	6.67%	2, 3, 4, 5, 6	CO1				
3	a) Pattern Making: Pattern making process and various tools used in pattern making. b) Sizing: Importance of sizing of garment and the process of generating size charts. c) Grading: Various techniques of grading of pattern size to accommodate the target group.	09	15%		CO1 CO2 CO3	PSO1, PSO4, PSO6 PSO8			
4	a) Marker Maker and Marker Planning: Various process and the systems used in lay planning method, marker planning and their relevant calculations.	09	15%						
5	Spreading: Role of spreading, Different methods and accessories of spreading, Modes of spreading, Concept of symmetric fabric & asymmetric fabric and its impact on selection of spreading mode, Constrains of spreader.	04	6.67%			PSO1, PSO2, PSO3, PSO5			
6	Cutting Room: Requirements of good cutting, Various types of scissors used during cutting, Types of manually operated cutters, Computerized knife cutter, Structural & technical details of Unconventional Cutter, Auxiliaries of cutting room: Driller & Notcher, their role & operating	08	13.33%						

	mode.								
7	Sewing room: Requirements of good sewability, Sewing room Variables: • Seam: Requirements of good seam, Types of seam along with their application area, • Stitch: Types of stitch, Stitch formation cycle for simple lock stitch as well as chain stitch, comparison of chain stitch & lock stitch, • Sewing Machine: Different parts of sewing machine & their role, • Feed Mechanisms: Structural design of parts involved in feeding mechanism and their role, Types of Feed Mechanisms used on Industrial sewing machine • Sewing Needle: Anatomy of sewing needle, role of different parts of needle, Designation of needle, types of needle & their application area. • Sewing Thread: Sewing thread types, designation of thread, Quality requirements for good sewing threads	10	16.67%	2,3,4,5	CO1 CO2 CO3				
8	a) SWOT analysis of readymade garment manufacturing industry. b) Branding and its strategy of readymade garment manufacturing industry. c) Retailing, marketing and sales of readymade garment manufacturing industry. d) Merchandizing of readymade garment manufacturing industry e) Garment industry in India and investment appraisal analysis of readymade garment manufacturing industry. f) Intellectual property right and its relevance in	14	23.33%	3, 4 ,5, 6	CO1, CO4, CO5, CO6, CO7				

	garment industry.								
Reference Books									
1.	The Technology of Clothing Manufacture [II nd Edition]:- Harold Carr & Barbara Latham. ISBN-10: 0632037482, ISBN-13: 978-0632037483, Wiley-Blackwell Publication, March 30, 1994								
2.	Introduction to Clothing Manufacturing:- Gerry Cookling. ISBN-10: 9780632058464, ISBN-13: 978-0632058464, Wiley-Blackwell; 2 edition (September 1, 2006)								
3.	Garment Technology for Fashion Designers, Gerry Cooklin, ISBN: 9788126515844, Wiley India Publication.								
4.	Garment Technology:- NCUTE Proceedings.								
5.	Inside Fashion Design – Sharon Lee Tate, Harper Collins Publication, U.K., 1989								
6.	Fundamentals of Clothing and Textile by Mary Evans								

 सत्यं शिवं सुन्दरम्	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2019-20					
B.E. (Textile Technology): Regular Programme										
Year	IV	Core / Elective / FoundationTXE1804 Knitting	Credits / Hours per week				04(theory)			
Semester	II	Year of Introduction: 2005 Year of Syllabus Revision: ---	Maximum Marks / Grade				100(theory)			
Mode of Transaction		Lectures & Tutorials								
Course Outcome (CO) TXE 1804 CO1 Understanding different between woven and knitted structures CO2 Understanding and learning different basic weft knit structures CO3 Understanding and learning different stitch variations in weft knit structures CO4 Understanding and learning different methods of ornamenting weft knit structure CO5 Understanding different between warp and weft knitted structures CO6 Understanding basic elements of knitting CO7 Understanding and learning loop formation in warp knitting CO8 Understanding and learning developments in warp knitting										
Unit No.	Topic /Unit		Contact Hours	Weight age (%)	BT Level	CO	PSO	Elements of Employability (Emp)/Entrepre	Relevance to Local (L)/ National (N)/ Regional (R)/Global (G) develop	Relation to Gender (G), Environment and Sustainability (ES),

							neur ship (Ent) / Skill Deve lop ment (SD)	mental needs	Human Values (HV)an d Profess ion al Ethics (PE)
1	Introduction to weft knitting, courses and wales in a weft knit structure, some technical terms in weft knit structures- face loop stitch, reverse loop stitch	1	5	1,2,3, 4,5	CO1 CO3	PSO 1 PSO 2	EM P, EN T, SD	L, N, R, G	G,ES
2	Single jersey structure- introduction, symbolic representation, technical face and technical back in a single jersey structure An anatomy of loop a loop stitch, cross over points and configuration of a single jersey structure, laddering effect in a weft knit structure, characteristics of a single jersey structure	3	5	1,2,3, 4,5	CO2	PSO 1 PSO 2 PSO 3 PSO 6 PSO7	EM P, EN T, SD	L, N, R, G	
3	Rib, interlock and purl structures knit structure – introduction, symbolic representation, features and properties of fabric and machine to knit them	4	10	1,2,3, 4,5	CO4	PSO 1 PSO 2 PSO 3 PSO 6	EM P, EN	L, N, R, G	

						PSO7	T, SD		
4	Various elements of weft knitting – different needles, cylinder, cam, sinker	04	7.0	1,2,3	CO5	PSO5	EM P, EN T, SD	L, N, R, G	
5	<u>Knitting machines:</u> 1. Rib knitting machine: Parts of the machine and knitting cycles 2. Purl knitting machine: Parts of the machine and knitting cycles 3. Interlock knitting machine: Parts of the machine and knitting cycle	08	13.0	1,2,3	CO7	PSO7	EM P, EN T, SD	L, N, R, G	
6	Tuck and float stitches, knitting of float stitches, symbolic representation Structural variations in weft knit structures through tuck and float stitches, multiple cam tracks in a weft knitting machine, swing cam, interchanging cams Production of multi-colour designs through tuck and float stitches, weft knitting machines with jacquard Determining number of cam tracks and needle arrangement for a given design Effect of float and tuck stitches on fabric properties	10	15	1,2,3, 4,5,6	CO5	PSO 1 PSO 2 PSO 3 PSO 4 PSO 6 PSO7 PSO 8	EM P, EN T, SD	L, N, R, G	

7	Loop transfer stitches- introduction, knitting, symbolic representation, Loop transfer stitches for ornamenting single jersey structure, Rib to plain structure through loop transfer, Racked rib structure	4	7.5	1,2,3, 4,5,6	CO5	PSO 1 PSO 2 PSO 3 PSO 4 PSO 6 PSO 7 PSO 8	EM P, EN T, SD	L, N, R, G	
8	<u>Weft knitting Calculations</u> Production and other calculations related to weft knitting machines and fabrics	06	10.0	1,2,3	CO5	PSO 1 PSO 2 PSO 3 PSO 4 PSO 6 PSO7 PSO 8	EM P, EN T, SD		
9	Principle of production of sock structure and knitted gloves	2	2.5	1,2,3, 4,5	CO6	PSO 1 PSO 2 PSO 3 PSO 4 PSO 6 PSO 7	EM P, EN T, SD	L, N, R, G	
10	Ornamentation of single jersey fabrics – horizontal stripes, plated jersey fabrics etc., Ornamentation of rib structures, Some double knit structures like single pique, ponte-di-roma, ottoman rib...	4	5	1,2,3, 4,5	CO7	PSO 1 PSO 2 PSO 3 PSO 4 PSO 6 PSO 7 PSO 8	EM P, EN T, SD	L, N, R, G	
11	Knitting actions:	05	7.0	1,2,3	CO6	PSO 1 PSO 2 PSO 3	EM P, G	L, N, R, G	

	Knitting actions of latch, beard and compound needles					PSO 4 PSO 6 PSO 7	EN T, SD		
12	Warp knitting : a) Introduction b) Classification of Warp knitting machines c) Racshel machine-Parts and knitting cycle d) Tricot machine- Parts and knitting cycle e) Fabric faults f) Developments	09	13.0	1,2,3	CO8	PSO 1 PSO 2 PSO 3 PSO 4 PSO 6 PSO 7	EM P, EN T, SD	L, N, R, G	
Reference Books:									
1.	Knitting Technology by David.J.Spencer Published by Pergammon Press								
2.	Knitting Technology by Prof. D. B. Ajgaonkar, Universal Publishing Corporation								
3.	Warp knitting production : S Raz; Published by Mellian dTextilberichte.								
4.	Flat Knitting by S Raz; Published by Mellian dTextilberichte.								
5.	Circular knitting by Iyer, Mammel and Schach; Published by Meissenbach GmbH.								

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2019-20					
B.E. (Textile Technology): Regular Programme										
Year	IV	Core / Elective / Foundation TXE 1805 : Manmade Fiber Technology II	Credits / Hours per week				04(theory)			
Semester	II	Year of Introduction: 2005 Year of Syllabus Revision: ---	Maximum Marks / Grade				100(theory)			
Mode of Transaction		Lectures &Tutorials								
Course Outcome (CO) TXE 1805 CO1 Understand Need and various conversion methods established for transformation of flat filament yarn to preferable voluminous yarn CO2 Understand detailing of commercially successful textured yarn production systems. CO3 Analyze impact of various factors on textured yarn quality and cost. CO4 Understanding correlation between manmade fiber properties and short staple spinning process variables CO5 Impartbasic knowledge about different technical changes required on short staple spinning set up for processing manmade fibers and their blends.										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional(R)/Global (G) development needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values

									(HV) and Professional Ethics (PE)
1	a) Need for imparting bulk to flat configured filaments, b) Texturizing: • Definition, Benefits on short staple spinning, • Types of textured yarns: stretch yarn, modified stretch yarn & bulk yarn, • Different concepts launched for texturizing along with their associated merits & demerits	03	5%	1, 2	CO1	PSO1, PSO4, PSO7 PSO8	EMP, SD	N,G	G, ES
2	d) Concept of Draw texturizing, types of Draw Texturising e) False twist Texturising: • Basic physics involved in false twist texturizing process for the transformation of flat yarn to stretch & modified stretch yarn, • Correlation of twist theory with false twist textured yarn structure. • Structure features of false twist texturizing machine variables. • Effect of different Process variables: Twist, Tension, Temperature & Time on textured yarn quality. • Effect of different material variables on the performance of false twist textured yarn • Factors influencing performance of friction textured yarn: D/Y ratio, tension ratio, angle of	08	14%	2, 3, 4, 5	CO1 CO2 CO3				

	contact, coefficient of friction, twister angle								
3	Testing of False (Friction) textured yarn: - Physical properties- denier, twist amount & direction - Textured yarn characteristics: boiling water shrinkage, residual shrinkage, crimp rigidity, crimp contraction force by CCC-method or HCC- method, Dynafil, TYT	05	8%	2, 3, 4,5	CO3				
4	Air jet texturizing:Significance in terms of properties & versatility of material. - Modern air jet texturizing machine parts and their role in improving textured yarn quality. - Types of air jet nozzles: Conversion-Diversion type Nozzle & Cylindrical nozzle, Their merits & demerits. - Effect of different machine & process variables on the performance of air jet textured yarn: type of nozzle, Stretch, Over feed, wetting etc. - Effect of different material variables on the performance of air jet textured yarn: Fineness, Dpf, filament cross-section, spin finish etc.	09	15%	2,3,4,5	CO1 CO2 CO3	PSO1, PSO4, PSO6 PSO8			
5	Testing of Air jet Textured yarn: - Physical characteristics: fineness, - Mechanical properties. - Structural details: loop stability, loop frequency etc. Non-classical texturizing techniques: Differential shrinkage, Mechanical crimp texturizing	05	8%	1, 2,, 3, 4	CO3	PSO1, PSO2, PSO3, PSO5			
6	Limitations of cotton fiber production system in completing demands of world populations. Types of man-made fibers available in world market and their	08	13%	3,4,6	CO5				

	Merits and demerits in relation to cotton fiber. Common Spinning systems: Cotton, Worsted and Woolen. Fiber characteristics required for better Spinnability or problems faced in spinning flat configured manmade cut staples on short staple or long staple spinning systems; crimp, spin finish, static charges generation, low bulk etc. Importance of blending of manmade cut staple with natural cotton fibers. Fiber properties need to be verified before formulating blend: significance on quality and cost of yarn produced					PSO1, PSO2, PSO3, PSO4			
7	Selection of blend components, Importance and methods for verifying compability of fibers used in blending, blend ratio. Importance of blend homogeneity, Different methods of measuring blend homogeneity. Different mechanics of blending used in short staple spinning. Blow room blending: importance, detailing of blow room blending process. Merits and demerits of blow room blending in meeting desired quality and cost of blended yarn. Draw frame blending: importance, detailing of Draw frame blending process. Merits and demerits of draw frame blending in meeting desired quality and cost of blended yarn	12	20%	3,4,5	CO5	PSO2, PSO3, PSO5			
8	Structural features of man-made fiber processing card at high production rate. Comparative features of blow room blending process with draw frame blending process with respect to one of the leading manufacturer's production line. Calculations associated with blend homogeneity. Possibility of spinning blend on unconventional spinning system: problems and possible remedial measure. Changes required for the Rotor machine set up to spin the blend successfully. Quality parameters of blended yarn and methods of their	10	17%	4,5,6	CO5	PSO1, PSO2, PSO6, PSO7			

	measurement								
Reference Books									
1.	Textured yarn Technology- MANTRA publications								
2.	False Twist Textured Yarns: Principles, Processing and Applications, C. Atkinson,, Woodhead Publishing Ltd, Cambridge (2012)								
3.	Yarn Texturing Technology, J.W.S. Hearle, L. Hollick, D.K. Wilson, Woodhead Publishing Ltd, Cambridge (2001)								
4.	https://youtu.be/txXBVZ6YhVA								
5.	Spinning Of Manmade And Blends on Cotton system by K. R. Salhotra								
6.	W.klein Series Vol-6								
7.	Textile Yarns by B. C. Goswami, J.G. Martindale and Scardino								

8	Testing of drawn yarn: Denier, strength, elongation, boiling water shrinkage. Testing of draw texturized yarn: Denier, strength, elongation, boiling water shrinkage, textured yarn defects and their possible causes and remedies, effect of ambient condition, process control programme at continuous filament plant. Testing of air jet texturized yarn: Denier, strength, elongation, boiling water shrinkage, loop height, loop frequency, bulk %, textured yarn defects and their possible causes and remedies, effect of ambient condition, process control programme at continuous filament plant.	8	27%			
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	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2019-20					
B.E. (Textile Technology): Regular Programme										
Year	IV	Core/Elective/Foundation TXE 1806: Technical Textile	Credits / Hours per week				04(theory)			
Semester	II	Year of Introduction: 2005 Year of Syllabus Revision: ---	Maximum Marks / Grade				100(theory)			
Mode of Transaction		Lectures, Tutorials								
Course Outcome (CO) TXE 1806										
CO1 Understanding the fundamentals of design of technical textile and application										
CO2 Learn the principles of manufacturing specialty fibres, nonwoven and technical textile.										
CO3 Solving typical performance requirements of technical products										
CO4 Understand the interrelationship between textile material, behaviour and requirement based on application										
CO5 Learn about important designing and standardization										
CO6 Explore the different application and understand reverse engineering.										
CO7 Understand the requirement of sustainable materials, product and process										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development	Relevance to Local (L)/ National (N)/ Regional (R)/ Global (G) development	Relation to Gender (G), Environment and Sustainability (ES), Human

							(SD)	I needs	Values (HV) and Professional Ethics (PE)
1	Introduction : Technical Textiles, Importance of Technical Textiles, Growth of Technical Textiles and Nonwoven Technical Textiles , End use applications	3	5	2,3	CO1	PSO1	Emp,S D,Ent	N,G	ES
2	Classification of High performance fiber, How technicality can be introduce at different stage of material, Nano fiber production and application	6	10	2,3	CO2	PSO 1, PSO 2			
3	Technical and Hybrid yarns, Structures, Modification in Conventional method and Newly developed methods. Application in elastomar and conductive yarns.	7	12	2,3,5	CO3, CO4	PSO 2, PSO 4 PSO 5			
4	Technical fabrics for different application like spots, protection etc Different Preforms structure, production of multiaxial and 3D Fabric and its application in Textile structural composite.	8	13	2,3,4, 5	CO3, CO4, CO 6	PSO 2, PSO 4 PSO 5			
5	Technical textile with sustainable concept and coating technology and sustainable medical application and its quality standered.	6	10	1,2,3	CO5, CO7	PSO 4, PSO 6, PSO 7			
6	Production of Specialty Fibers for Technical Textiles, its properties and characteristics.	6	10	1,2,3, 4	CO1, CO2, CO4,	PSO1, PSO6, PSO7			
7	Classification of Nonwovens, Production Methods of Nonwovens, Production of needle-punched Nonwovens and its application in Filter fabrics for industrial use. Application of Needle punch nonwovens like Automotive Textiles etc. and other	12	20	1,2,3, 4,5,6	CO1, CO2, CO3, CO4, CO5	PSO1, PSO2, PSO6, PSO7			

	automotive textile like airbag, belt etc								
8	Span lace, Spun bond, Meltblown and other techniques to produce nonwoven, its characteristics and applications in filtration, medical etc.	6	10	2,3,4, 5,6	CO1, CO2, CO3, CO4, CO6	PSO1, PSO2, PSO4, PSO6, PSO7			
9	Lamination and Nano finishing techniques for technical textile	6	10	2,3,5, 6	CO3, CO5, CO6, CO7	PSO1, PSO2, PSO4, PSO6, PSO7			

Reference Books:

1.	Hand Book of Industrial Textiles bySabitAdanur
2.	Hand Book of Technical Textile by <u>A. Richard Horrocks</u> , <u>Subhash C. Anand</u>
3.	Hand Book of Technical Textile by V. K. Kothari
4.	Hand Book of Nonwoven by S Russell
5.	Series of Books on Medical Textile, Automotive Textile, Composite etc
6.	Book on Specialty yarn and Fabric structures byR H Gong
7.	Handbook of Properties of Textile and Technical Fibres byA. R. Bunsell
8.	New Fibers by Tatsuya Hongu Glyn O. Phillips

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2019-20					
B.E. (Textile Technology): Regular Programme										
Year	IV	Core / Elective / Foundation TXE1807: Textile Production Management and Costing	Credits / Hours per week			04(theory) 04(practical)				
Semester	II	Year of Introduction: 2005 Year of Syllabus Revision: ---	Maximum Marks / Grade			100(theory) 50(practical)				
Mode of Transaction		Lectures, Tutorials & Practical								
Course Outcome (CO) TXE 1807 and 1807L										
CO1 Understanding the concept and applicability of textile production planning and control.										
CO2 Learning about textile costing and financial management of textile mill.										
CO3 Imparting knowledge about textile project management and aware about government’s policies related to textile industry.										
CO4 Appraising about textile mill organization, human relationship management, standing orders under factory’s act.										
CO5 Drawing of lay outs and solving tutorials of cost calculations.										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional (R)/ Global (G) developmental needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV)

									nd Profess ional Ethics (PE)
1	Introduction to subject and significance of subject title Important worked: Production, management and costing. Flow charts of spinning lines Conventional and modern	6	10%	1., 2, 3,	CO1	PSO2 ,PSO3	Emp, Ent	L, N,G	G,ES, HV,PE
2	Brief explanation of innovative technology with calculation on Blow Room production, ‘Spin plan’ carded yarn, combed yarn, Rotor yarn, Hosiery yarn, blended yarn,(In Ne and Tex system).Free hand layout of spinning machines	9	15%	2, 3, 4,5	CO1 CO2	PSO2 ,PSO3 .PSO8			
3	Different machine calculation and system used in Ring yarn (carded, combed and blend) , Knitted yarn and Rotor yarn production line	9	15%	2, 3, 4,5	CO1 CO2	PSO2, PSO3. PSO8			
4	Essential Characteristics of an Entrepreneur, Material handling equipment, Standard layout of spinning line.	6	10%	1., 2, 3	CO4	PSO5, PSO7			
5	Estimation of raw material and machine requirement for different varieties of fabrics (cotton, blends & manmade). Time required processing order, balancing of production and associated calculations	09	15%	2,3,4	CO1	PSO2, PSO3. PSO8	Emp, Ent	L, N,G	
6	Techno economic analysis of typical fabric conversion processes, cost calculation, break even analysis and solving typical practical decision making problems using marginal costing and other financial ratio techniques (IRR,NPA,ROI etc).Inventory management.	09	15%	2,3,4	CO2	PSO2, PSO3,			
7	Factors affecting site selection, new project	06	10%	2, 3,	CO3				

	management, Government approvals required, Government policies/schemes related to Textile industry.			4,5					
8	Organization structure of textile mill, labour relations, training, motivation, disciplinary action as per standing orders	06	10%	1,2,3	CO4	PSO5, PSO7			

Reference Books

1.	Textile Project Management-Ormerod.Textile Institute
2.	Weaving-Machines,Mechanism,Management.Talukdar,Sriramulu,Ajgaonkar.Mahajan Publishers Pvt.Ltd.
3.	IGNOU-study material.
4.	Projects-planning, analysis, selection, implementation and review. Prasanna Chandra, Tata McGraw-Hill publication.
5.	Cost Accounting,Charles T.horngren,George Foster.Prentice-Hall of India publication.
6	Brochures of Spinning machines from RIETER, LMW, TRUETZSCHLER etc. (Includes machine data for production, layout etc.
7	Machine Manuals and standard Layout

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering				Academic Year		2019-20		
B.E.(Textile Technology) Regular Programme										
Year	IV	Core / Elective / Foundation TXE1807L: Textile Production Management and Costing				Credits / Hours per week		04		
Semester	II	Year of Introduction: 2005 Year of Syllabus Revision: ---				Maximum Marks / Grade		50		
Mode of Transaction		Drawing, term work & tutorial solving.								
No.	Experiment (Drawing Sheets)					Contact hours	Weightage%	BT Level	CO	PSO
1	Lay out drawing of weaving unit with modern machineries (single product)					06	10%	4,5,6	CO5	PSO3
2	Lay out drawing of weaving unit with modern machineries (multi products)					06	10%	4,5,6	CO5	PSO3
3	Lay out drawing of Knitting and garment Unit.					06	10%	4,5,6	CO5	PSO3
4	Production time estimation bar chart.					06	10%	4,5	CO5	PSO3
5	Textile product cost calculations & preparation of project report for a textile product.					06	10%	4,5,6	CO5	PSO3,PSO5
6	Spinning Project-I ,Carded yarn, Lay out drawing with inking					10	17%	4,5,6	CO5	PSO3
7	Spinning Project-II ,Combed yarn, Lay out drawing with inking					08	13%	4,5,6	CO5	PSO3
8	Spinning Project-III ,Modern Machinery, Lay out drawing with inking					12	20%	4,5,6	CO5	PSO3

	The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering		Academic Year		2019-20					
B.E. (Textile Technology): Regular Programme										
Year	IV	Core / Elective / Foundation TXE 1808 : Process Control & Modern Yarn Production	Credits / Hours per week				04(theory)			
Semester	II	Year of Introduction: 2005 Year of Syllabus Revision: ---	Maximum Marks / Grade				100(theory)			
Mode of Transaction		Lectures &Tutorials								
Course Outcome (CO) TXE 1808 CO1 Understand Need and procedures followed for Process control during Ring Spinning Process CO2 Understand various controls and remedial measures taken care off during yarn manufacturing process to get desired yarn quality. CO3 Analyse impact of various factors on product cost and means for controlling product cost. CO4 Impart basic knowledge about different technologies designed to get spun yarn and application areas.										
Unit No.	Topic/Unit		Contact Hours	Weightage (%)	BT Level	CO	PSO	Elements of Employability (Emp)/ Entrepreneurship (Ent)/ Skill Development (SD)	Relevance to Local (L)/ National (N)/ Regional(R)/ Global (G) developmental needs	Relation to Gender (G), Environment and Sustainability (ES), Human Values (HV) and

									Professional Ethics (PE)
1	Need for process control, - Derivation of norms & their revision process, - Different means of process control for ring spinning. - Process control program used at different stages of Ring spun yarn production; Blow room to Ring frame, for Carded as well as Combed Yarns.	04	7%	1,2	CO1	PSO1, PSO4, PSO7 PSO8	EMP,SD	N,G	G, ES
2	Yarn realization: - Definition & computations of different YR indices : cotton consumed; cotton issued, opening balance, closing balance, stock in process, soft waste added to mix, - Definition & computations of different indices of yarn produced: Ring frame production, Hank meter gain, Idle spindle, Twist contraction. - Case study to elaborate procedure followed for yarn realization computation done in the mill & its analysis	06	10%	2, 3, 4, 5	CO2				
3	Formulation of mix: - Importance in Process control - Different attributes of cotton mix formation, - Classical to modern mix formulation practices & their merits and demerits evaluated on the ground of : - Statistical techniques: Significance test, CD,	06	10%	2, 3, 4,5	CO3				

	Concept of FQI & Q, Concept of SCI & its importance in accurate determination of cotton technological value, Linear Programming; its role in defining Cotton fiber proportion in the mix scientifically, • Testing techniques: Semi- automatic instrumental era, Automatic instrumental era; Significance of HVI & AFIS, • Decision making in cotton fiber selection and proportion for mix: Restrictions of human decision bias mix formulation. Concept of Artificial Neural Networking (ANN) as an option for human decision making, Concept of EFS & BIAS. Case study: ANN & LP based mix formulation & its impact analysis for yarn quality & cost, Case study: ANN & LP based mix formulation & its impact analysis for process control								
4	Productivity: a) Concept of Productivity, b) Different indices; MPI, LER, PI, MEI, used in the computation of productivity as per ATIRA method,, their definitions & method of computation c) Case study: • Explaining procedure for computation of MPI, LER, PI, MEI. • Defining AMPI, ALER, AMEI, API on the basis	06	10%	3, 6	CO4				

	of short term goals, defining long term goals & their effect. d) Means for improving Efficiency: snap study, End breakage study, concept of machine interference, remedial measures for avoidable machine interference								
5	a) Concept of HOK, b) Computation of Different indices of productivity: P, HOK, OHS.... as per SITRA method; their definition & importance c) Case Study: Elaborating method of computation of different indices of HOK for monthly mill data & their interpretation.	05	8%	1, 2,, 3, 6		PSO1, PSO2, PSO3, PSO5			
6	Machinery audit: - Definition & its importance in process control, - Different tools used for machinery audit: Peri microscope, Template, Nilometer, Roller Eccentricity tester, Speedometer, Stroboscope etc.	03	5%	1,2,4	CO1 CO2	PSO1			
7	Limitations of Ring Spinning, Developments in Ring Spinning, History and development of Open End spinning, Principle of Break spinning/OE Spinning, Different systems of Open End spinning,	11	18%	1,2,,3, 4	CO1 CO2 CO3 CO4	PSO1 PSO2 PSO3			
8	Classification of New Spinning Methods, Advantages and disadvantages of New Spinning Systems, Scope of New Spinning methods.	04	7%	2, 4, 5	CO2 CO4				
9	Air jet spinning, Friction Spinning, Twist-less, Self-twist and other unconventional spinning systems, Various process parameters of unconventional spinning systems, Structure and properties of these yarns	15	25%	2, 3, 5, 6	CO1 CO2 CO3 CO4				

Reference Books	
1.	Process Control in Spinning, A.R. GARDE& T.A. Subramaniam, ATIRA Silver Jubilee Mono graph, Ahmedabad Textile Industry's Research Association Publication, 1974.ASIN: B0007AK08K
2.	Quality Control in Spinning, T. V. Ratnam, K.P. Chellamani, Edited by ArindamBasu, SITRA Publication
3.	Cost Control and Costing in Spinning Lab, T. V. RatnamIndraDorai Swami, S. Seshadri, R. Rajamanikam, SITRA Publication
4.	Tasnim N. Shaikh, Sweety A. Agrawal, Engineering Cotton Yarns with Artificial Neural Networking (ANN), WPI Publishing, Published December 6, 2017 , ISBN 9789385059209.
5.	Eric Oxtoby, “Spun Yarn Technology”, Butterworths, March 1987.eBook ISBN: 9781483161808
6.	Advances in technology of Yarn Production by NCUTE publications, Indian Institute of Technology, Delhi.
7.	Rotor Spinning, R. Neild
8.	SITRA Norms for Spinning Mills, SITRA Publications
9.	Textile Yarns , B. C. Goswami, J.G. Martindale, and Scardino, Wiley-IntersciencePublication,1977.
10.	New Spinning System (Short Staple Spinning) Vol – 5, W.Klein, Published by The Textile Institute, Manual of Textile Technology, Edited by H. Stalder, 1993.ISBN:1870812557

		The Maharaja Sayajirao University of Baroda Faculty Technology and Engineering Department of Textile Engineering			Academic Year		2019-20		
B.E.(Textile Technology) Regular Programme									
Year	IV	Core / Elective / Foundation TXE 1808L : Process Control & Modern Yarn Production Pract /TW/viva			Credits / Hours per week		02		
Semester	II	Year of Introduction: 2005 Year of Syllabus Revision: ---			Maximum Marks / Grade		50		
Mode of Transaction		Laboratory Experiments, discussion, term work and viva							
No.	Experiment				Contact hrs.	%Weight age	BT Level	CO	PSO
1	Process control Program parameters used in Blow room: Resolving numerical, discussion on Case study and experimentation done on Laboratory machineries				02	7%	1,2,3,4,5	CO1 CO2 CO3	PSO1, PSO2, PSO3, PSO4
2	Process control Program parameters used for Card: Resolving numerical, discussion on Case study and experimentation done on Laboratory machineries				02	7%			
3	Process control Program parameters used for Comber preparatory and Comber: Resolving numerical, discussion on Case study and experimentation done on Laboratory machineries				02	7%			
4	Process control Program parameters used for Draw frame: Resolving numerical, discussion on Case study and experimentation done on Laboratory machineries				02	6%			
5	Process control Program parameters used for Speed frames: Resolving numerical, discussion on Case study and experimentation done on Laboratory machineries				02	6%			
6	Process control Program parameters used for Ring frame: Resolving numerical, discussion on Case study and experimentation done on Laboratory machineries				04	12%			
7	Performance assessment of Spinning Department w.r.t. Yarn Realization: Resolving numerical and discussion on Mill data based Case study				04	12%			
8	Measures for controlling quality and cost of spun yarn: Resolving numerical, discussion on Case study w.r.t. mix formulation variables				02	8%			
9	Performance assessment of Ring Spinning Productivity w.r.t. ATIRA and SITRA				04	12%			

	methods by Resolving numerical and discussion on Mill data based Case study					
10	Exercise use of Machinery Audit tools.	02	7%	1, 2,3,4	CO2 CO3	PSO1, PSO2, PSO3
11	Material flow on Dref Spinning machine, Study Design features and drive set up for Dref spinning machine variables, Settings and maintenance, Friction spun yarn properties.	02	8%	4,5,6	CO2 CO4	PSO2, PSO3, PSO4, PSO5
12	Material flow on Air jet Spinning machine, Study Design features and drive set up for Air jet spinning machine variables, Settings and maintenance, Air jet spun yarn properties.	02	8%		CO2 CO2	