

TEXTILE POLYMER SCIENCE [As Per Choice Based Credit System (CBCS) Scheme] SEMESTER - III			
Subject Code	15TX31	IA Marks	20
No. of Lecture Hours/Week	04	Exam Marks	80
Total Number of Lecture Hours	52	Exam Hours	03
CREDITS - 04			
COURSE OBJECTIVES:			
<p>1.As the basic building block of all textile products is polymers, acquiring knowledge in this subject is necessary for all undergraduate Textile Technology students.</p> <p>2. This subject deals with basics of polymer science & Technology, general aspects of polymer production, polymer flow behavior and polymer properties with emphasis given to polymer used for production of textile products.</p>			
Modules		Teaching Hours	Revised Bloom's Taxonomy (RBT) Level
MODULE 1: Introduction and definition of monomers and polymers. History and Classification of polymers. Characteristics of fibre forming polymers and their general applications. Study of synthesis of polymers by chain, step and co-ordination polymerization. Study of various types of initiators for addition polymerization. Comparison of different types of polymerization methods.		11Hrs	L1, L2, L3
MODULE 2: Co-polymerization - Concept of co-polymerization, reactivity ratios in Co-polymerization. Kinetics of polymerization - estimation of kinetic chain length, illustration of effect of various parameters on kinetics of polymerization. Functionality in polymers. Carothers equation and extent of polymerization. Techniques of polymerization, comparison of various Techniques.		10Hrs	L1, L2, L3
MODULE 3: Rheology of polymers - Define Newtonian and non-Newtonian Fluids. Basic equations related to fluid flow, capillary flow. Characteristics of polymeric solutions. Thermo dynamics of polymer solutions. Analysis of Mechanical and tensile behaviour of polymers. Time dependent mechanical and temperature dependent mechanical behavior. Study of Maxwell's, Kelvin's & Burger's Models.		11Hrs	L1, L2, L3,L4
MODULE 4: Concepts of avg. molecular weight and molecular weight distribution. Determination of molecular weight of polymers using end group analysis, osmometry, viscometry and gel permeation chromatography. Importance of molecular weight. Molecular weight differences for fibers & plastics.		10Hrs	L1, L2, L3

MODULE 5: Chemistry of polymer degradation - various types of degradation - oxidative, mechanical, Photo and thermal degradation. Use of Inhibitors and anti-oxidants to control polymer degradation. Thermal analysis of polymers - glass transition temperature of polymers. Determination of glass transition temperature. Free volume concept. Study of thermal characterization by DSC, DTA, TGA and TMA	10Hrs	L2, L3,L4
Graduate Attributes (as per NBA) <ul style="list-style-type: none"> ➤ Engineering Knowledge ➤ Problem Analysis ➤ Design/development of solutions (partly) ➤ Interpretation of data 		
COURSE OUTCOME: <ol style="list-style-type: none"> 1. Students will acquire knowledge in basic concepts of polymer Technology with special reference to Textile polymers. 2. After acquiring knowledge in this subject, the students will be able to work in polymer production industry and research laboratory. 		
Scheme of Examination / Question paper pattern <ul style="list-style-type: none"> • Two full questions (with a maximum of four sub questions) of sixteen marks each to be set from each module. Each question should cover all contents of the respective module. • Students have to answer five full questions choosing one full question from each module 		
Text Books: <ol style="list-style-type: none"> 1. Text book of polymer Science, Billmeyer.W., Wiley Int.Sc. New York 1984. 2. Polymer Science, Gowarikar V.R., Vishwanathan N.V., Jayadev Sridhara, Wiley Eastern Ltd., New Delhi, 1995. 3. Principles of polymerization, Odian G., John Wiley & sons, NY, 1976. 4. Mechanical properties of polymers, Ward I.M. John Wiley & sons, NY, 1971. 		
References: <ol style="list-style-type: none"> 1. Properties and structure of polymers, Tobolski, John Wiley & sons, NY, 1960. 2. Mechanical Properties of polymers, Nielson L.E., Marshal Dekkar, NY, 1974. 3. Polymer characterization, Cambel and White, Chapman& Hall, London. 		

TEXTILE FIBRES [As Per Choice Based Credit System (CBCS) Scheme] SEMESTER - III			
Subject Code	15TX32	IA Marks	20
No. of Lecture Hours/Week	04	Exam Marks	80
Total Number of Lecture Hours	52	Exam Hours	03
CREDITS - 04			
COURSE OBJECTIVES : The course will enable students to: 1. Recall, Recognize & Analyze the basic textile fibres. 2. Recall, Recognize & Analyze, plan basics of textile fibre and are introduced with different types of natural and manmade (regenerated) fibres. Origin, History, properties and various aspects of textile fibres are taught in this subject.			
Modules		Teaching Hours	Revised Bloom's Taxonomy (RBT) Level
MODULE 1: Brief history on origin of textiles. Introduction to textile fibres and essential requirements of textile fibres. Classification of textile fibres. Cotton fibres – Origin, History, Cultivation, Grading of cotton fibre, Physical and Chemical properties of cotton fibres		11Hrs	L1, L2,L3
MODULE 2: Protein fibres: - Introduction to natural protein fibres. Study of life cycle of Silk worm. Extraction of silk fibre, properties of silk fibre, Special features of silk fibre, Different varieties of silk yarns and brief introduction to wild silk, Wool – origin, different types of wool, grading of wool, properties of wool fibres		10Hrs	L1, L2,L3
MODULE 3: Bast fibres – Introduction, Types of bast fibres, Method of extraction of bast fibres, Physical & Chemical properties of major bast fibres like Jute, Ramie flax fibres. Introduction to coir, hemp and banana fibres. Flow chart for the conversion of cotton, silk and Wool fibres to yarn and fabric.		10Hrs	L1, L2, L3
MODULE 4: Introduction to manufactured fibres. Types of manufactured fibres, comparison of manufactured fibres with natural fibres. Concept of manufactured fibres spinning, Spinnability concept of polymeric fluids. Brief outline on melt, dry and wet spinning. Comparison of these spinning methods. Process variables in melt spinning. Instabilities in melt spinning. Speeds of melt spinning. Brief outline on special shaped fibres, micro denier, ultrafine and nanofibres. Spin finish applications- objectives, formulations and methods of application.		11Hrs	L1, L2, L3

<p>MODULE 5: Regenerated fibres - types of regenerated fibres, Chemistry and production of regular Viscose rayon, Di-acetate, Tri acetate, Cuprammonium and Eco-friendly rayon fibres. Studies on modification of viscose rayon. Studies on regenerated Bamboo fibres. India's position in natural and manufactured fibres in global scenario.</p>	<p>10Hrs</p>	<p>L1, L2,L3</p>
<p>COURSE OUTCOME: On completion of this course, Students will be able to</p> <ol style="list-style-type: none"> 1. Recall & Recognize about fundamentals concepts of textiles products and textile industry. 2. Recognize & Analyze, Apply, the problems associated with the fibres while working in textile industry 		
<p>Graduate Attributes (as per NBA)</p> <ul style="list-style-type: none"> ➤ Engineering Knowledge ➤ Problem Analysis ➤ Design/development of solutions (partly) ➤ Interpretation of data 		
<p>Scheme of Examination / Question paper pattern</p> <ul style="list-style-type: none"> • Two full questions (with a maximum of four sub questions) of sixteen marks each to be set from each module. Each question should cover all contents of the respective module. • Students have to answer five full questions choosing one full question from each module 		
<p>Text Books:</p> <ol style="list-style-type: none"> 1. Hand book of Textile fibre, Cook J. Vol.1 & II, Marrow Wat Ford, England. 2. Textile fibres, Shenai V.A., Sevak Bombay, 1980. 3. Manufactured fibre technology, Gupta V.B, Kothari V.K., Chapman Hall, London, 1997. 4. Introduction to Textile fibres, Srinivasa Murthy H.V, T.A.I., Mumbai 5. Handbook of natural fibres. Vol.- I R.M.Kozlowski Wood-Head. London- 2012. 		
<p>References:</p> <ol style="list-style-type: none"> 1. Manmade fibre science and Technology, Mark Atlas, Vol.I& II, Wiley, NT 1967. 2. Fundamentals of fibre formation, Ziabicki A. Wiley NY 1976. 3. Formation of synthetic fibres, Walczalk.K. Gordon & Sci. London 1977. 4. High speed fibre spinning, Ziabicki A. Wiley NY., 1985. 5. Manmade fibres, Moncrief R.W. John Wiley and sons, N.Y. 1966. 		

SPINNING TECHNOLOGY – I

[As Per Choice Based Credit System (CBCS) Scheme]

SEMESTER - III

Subject Code	15TX33	IA Marks	20
No. of Lecture Hours/Week	04	Exam Marks	80
Total Number of Lecture Hours	52	Exam Hours	03

CREDITS - 04

COURSE OBJECTIVES :

The objective of this Course is to describe the basic spinning processes in Textile Industry and to understand the various spinning operations such as Blow Room, Carding. Students acquire theoretical knowledge about the machineries used

Modules	Teaching Hours	Revised Bloom's Taxonomy (RBT) Level
<p>MODULE 1: Importance and need of Ginning. Explanation of working of different types of gins. Defects, causes and remedies of ginning. Baling process and bale weights Identification of important cotton growing countries. Impurities in the cotton and remedies to minimize impurities in cotton. Important cotton types and trash in those cottons. Evaluation of cotton grades.</p> <p>Definition and objects of mixing and blending. Types of blending and common blends. Influence of fibre parameters namely length, fineness, strength, elongation, chemical deposits and neps on spinning performance.</p>	11Hrs	L1, L2,L3
<p>MODULE 2: Objects of Blowroom and identification of its components. Types of opening action in blow room. Brief study of bale pluckers and bale grabbers. Study of design features and different types of openers and beaters on the present day Blow room. Modern developments in Blowroom.</p> <p>Evaluation of Blow room performance - Hank calculation, production and efficiency calculation. Process modification required in blow room to process blends of Polyester/cotton and polyester/viscose. Study of blow room line required for processing different types of blends.</p>	11Hrs	L2 ,L4,L3
<p>MODULE 3: Definition and objects of flat card. Study of design features and different types of clothing on licker in, cylinder and doffer and their specifications. Passage of material through revolving flat card. Auto leveller on card and its importance. Types of</p>	10Hrs	L1,L2, L3

autoleveller Setting of different parts of card and gauges used for setting.		
MODULE 4: Definition of draft in card and study of different types of draft and its calculation. Objects of stripping and grinding and their importance. Modern developments and salient features of modern cards. List out specification of the present day cards.	10Hrs	L1, L2, L3, L4
MODULE 5: Calculation of Hank of sliver, production and efficiency in carding. Study of various quality control studies such as wrapping procedure, cleaning efficiency, Nep removal efficiency and their comparison with standards.	10Hrs	L1,L2, L3,L4
COURSE OUTCOMES: On completion of this course, Students will be able to 1. Learn the various spinning processes carried 2. Gain knowledge about the machinery and Process Parameters of Blow room and Carding 3. Will be able to define the basics of spinning Technology		
Graduate Attributes (as per NBA) ➤ Engineering Knowledge ➤ Problem Analysis ➤ Design/development of solutions (partly) ➤ Interpretation of data		
Scheme of Examination / Question paper pattern • Two full questions (with a maximum of four sub questions) of sixteen marks each to be set from each module. Each question should cover all contents of the respective module. • Students have to answer five full questions choosing one full question from each module		
Text Books: 1. Manual of Cotton Spinning , Coulson. A.F.W. (Ed.), Vol. I to IV, Textiles Institute, Manchester, 1958. 2. Series on Textile processing , Zaloski. S. Tp - Institute of Textiles Technology USA Vol.I (Opening, Cleaning and Picking). 3. Technology of short-staple spinning , Klein. W., Vol.I, II, III and IV, Textile Institute Pub., Manchester 1989. 4. Spun Yarn Technology , Oxtoby, Butterworths, London, 1987.		
References: 1. Contemporary Textile Engineering , Happey. F. (Ed.) Academic Press Inc., 1981. 2. Hand book of Cotton Spinning , William Taggart., UniversalPubl corp. 1979. 3. Essential Facts of Practical Cotton Spinning , Pattabhiraman. T.K., Soumya Pub., Bombay 1979. 4. Cotton Spinning Calculations , Pattabhiraman. T.K., Soumya Pub., Bombay 1979. 5. Cotton Opening & Carding , Merril G.R., Pub: G.R. Merill, Lowell Mass, 1955. 6. Blowroom and carding NCUTE Pilot programme.		

FABRIC MANUFACTURING TECHNOLOGY – I

[As Per Choice Based Credit System (CBCS) Scheme]

SEMESTER - III

Subject Code	15TX34	IA Marks	20
No. of Lecture Hours/Week	04	Exam Marks	80
Total Number of Lecture Hours	52	Exam Hours	03

CREDITS - 04

COURSE OBJECTIVES :

- Recall & Recognize warp & weft preparation
- Recognize & Demonstrate Principles of winding Techniques, yarn clearers, tensioning devices and settings features of autoconers.
- Recall & Recognize & Demonstrate Systems of warping :, size formulations cooking m/c, Weft preparation, pirn winding m/cs
- Define, Recognize & Demonstrate Sizing Ingredients, size controls in sow box etc.
- Recognize, apply & analyze Modern concepts of sizing
- Recognize & Demonstrate Post sizing operations.

Modules	Teaching Hours	Revised Bloom's Taxonomy (RBT) Level
MODULE 1: Necessity and sequence of operations in warp and weft preparation. Different types of supply and end packages. Objects and principles of winding. Classification of winding machines. Derivation of expression to find winding speed and surface speed, cone angle, coil angle and angle of wind and their importance. Types of balloon breakers. Yarn clearers and tensioning devices. Different types and their settings, gain, knot factor, clearing efficiency.	10Hrs	L1, L2
MODULE 2: Uster classimat and its usefulness in selecting optimum clearing. Classification of auto winding machines. Different types of auto winding machines. Salient features of Autoconer, Uniconer, Schlofhas B.C Spooler etc. Winding faults - causes and remedies. Identification of cones, material handling, measurement of package density.	10Hrs	L1, L2
MODULE 3: Objects and systems of warping. Study of different types of modern creels. Study of modern friction driven and spindle driven beam warping machines. Study of different types of sectional warping machines and their salient features. Special warpers for polyolefin filament yarns. Special requirements of yarn preparatory for shuttleless weaving machines. Production calculation of all machines. Introduction to weft preparation/spindle & spindleless weft winders. Study of different types of weft winding machines. Unifil loom winders/Bobbin loaders	11Hrs	L1, L2, L3,
MODULE 4:	10Hrs	L1, L2, L3, L4

Objects of sizing. Study of Ingredients used for size preparation. Size formulation, study of mixing vessels such as pressure cookers, injection cookers, homogenizers, agitators and storing becks. Techniques of sizing, types of Sizing. Sizing recipes for natural fibres, man-made fibres and their blends. Salient features of modern sizing machines, creels and sow box.		
MODULE 5: Drying principles – multi-cylinder drying, hot air drying, radiation drying. Size pickup, size add on. Concept of single-end sizing. Head stock - dry splitting, comb, drag roll. After waxing, cut mark motion, beam pressing. Controls in sow box - stretch and its control, moisture measurement and temperature control. Recent trends in sizing i.e. foam sizing, solvent sizing, hot melt sizing. High pressure squeezing, migrating behavior of warp ends, dead loss, hard waste. Lappers, size defects and remedies. Post sizing operations - Drawing-in, leasing, knotting, automatic drawing in machine, gaiting-in technique.	11Hrs	L2, L3, L4
COURSE OUTCOME :		
<ul style="list-style-type: none"> • Recall & Recognize the necessity of warp & weft preparation • Recall & Recognize & Demonstrate Winding operation, accessories of winding settings • Recognize, Demonstrate & Analyze Winding m/cs their working features auto-winding machines • Recognize & Demonstrate Warping m/c, different types, and different creels. • Recognize, Demonstrate & Analyze Sizing concepts ingredients size cooking M/c, Saw box drying principles controls • Recall & Recognize & Analyze Post sizing operations. 		
Graduate Attributes (as per NBA)		
<ul style="list-style-type: none"> ➤ Engineering Knowledge ➤ Problem Analysis ➤ Design/development of solutions (partly) ➤ Interpretation of data 		
Scheme of Examination / Question paper pattern		
<ul style="list-style-type: none"> • Two full questions (with a maximum of four sub questions) of sixteen marks each to be set from each module. Each question should cover all contents of the respective module. • Students have to answer five full questions choosing one full question from each module 		
Text Books:		
<ol style="list-style-type: none"> 1. Textile Sizing by B.C.Goswamy. 2. “An Introduction to Winding and Warping”, Talukdar M K, Talukdar, Bombay Pvt. Circulation. 3. “Warp sizing mechanisms”, Ramsbottom Columbia press, Manchester, 1965. 4. Weaving tablets, Textiles Association of India, Bombay, 1985. 5. Yarn preparation, Sengupta R. –Vol I & II Mahajan Pub. Ahmedabad, 1970. 6. Modern Preparation and weaving machinery, Ormerod A. Butterworth publication Co. 1983. 		
References:		
<ol style="list-style-type: none"> 1. Cotton weaving, Gordev V and Volkov P, Mir Pub. Moscow 1987. 2. Automatic Weaving, Aitken, Colombia Press, Manchester 1969. 3. “Sizing Materials, Methods and Machines”, Ajsaonkar D B, Textiles trade press, Bmbay 1982. 4. An Introduction to Automatic weaving, Bennet G A, Columbia press, Manchester 1958. 		

CHEMICAL PROCESSING OF TEXTILES – I

[As Per Choice Based Credit System (CBCS) Scheme]

SEMESTER - III

Subject Code	15TX35	IA Marks	20
No. of Lecture Hours/Week	04	Exam Marks	80
Total Number of Lecture Hours	52	Exam Hours	03

CREDITS - 04

COURSE OBJECTIVES

This course aims at updating the knowledge of students in the following fields of chemical processing of textiles

1. Basics of wet processing, sequences.
2. Different preparatory process of singeing, desizing, scouring, bleaching and mercerization.
3. Machineries used for various wet processing activities.
4. Recent advances in wet processing activities.

Modules	Teaching Hours	Revised Bloom's Taxonomy (RBT) Level
MODULE – 1 Introduction to processing operations and sequences Chemicals and auxiliaries used for textile wet processing and their functions. Introduction to shearing and cropping. Objects of shearing and cropping. Objects of singeing, methods of singeing, working of various singeing machines, latest developments in singeing	10Hrs	L1, L2
MODULE – 2 Various desizing methods, Discussion on desizing - continuous desizing, desizing of cotton and other blends, latest developments in desizing. Objects of scouring, mechanism of scouring, methods of scouring, scouring of natural cellulose fabrics. Degumming of silk, scouring of wool and jute, scouring of synthetic fibres. Modifications required to scour knitted fabrics. Latest developments in scouring.	10Hrs	L1, L2, L3
MODULE – 3 Objects of bleaching, mechanism of bleaching and methods of bleaching. Bleaching of cellulosic fibres, natural protein fibres, common manufactured fibres and common fibre blends. Latest developments in bleaching. Objects of optical whitening, chemistry of optical whitening agents and optical whitening process for common fibres. Quality control methods for testing scoured and bleached materials and methods used for determination of degradation of cotton, during scouring and bleaching.	12Hrs	L1, L2, L3
MODULE – 4 Machines used for desizing, scouring and bleaching. Batch processes, semi continuous processes and continuous processes. Objects of mercerization, history and developments of	10Hrs	L1, L2, L3, L4

mercerization, physical and chemical changes in cotton due to mercerization, various factors affecting mercerization, degree or efficiency of mercerization.		
MODULE - 5 Methods of mercerizing yarns and fabrics. Machines used for mercerization, taught and slack mercerization. Principle of hot mercerization. Test methods for mercerized fabrics. Latest developments in mercerization. Brief study on eco-friendly preparatory processes. Water and energy management in preparatory processes.	10Hrs	L2, L3,L4
COURSE OUTCOMES		
<ol style="list-style-type: none"> 1. This subject helps the student to acquire knowledge of preparatory process of wet processing and pre preparatory process. 2. This subject prepares the student work in chemical processing industry. 3. Students are exposed to research field in chemical processing technology. 		
Graduate Attributes (as per NBA)		
<ul style="list-style-type: none"> ➤ Engineering Knowledge ➤ Problem Analysis ➤ Design/development of solutions (partly) ➤ Interpretation of data 		
Scheme of Examination / Question paper pattern		
<ul style="list-style-type: none"> • Two full questions (with a maximum of four sub questions) of sixteen marks each to be set from each module. Each question should cover all contents of the respective module. • Students have to answer five full questions choosing one full question from each module 		
TEXT BOOKS:		
<ol style="list-style-type: none"> 1. Technology of Textile Processing- Vol. III, V A Shenai, 1975, Sevak Publications 2. Technology of Bleaching and Dyeing of textile fibres - Chakraborty, 1972, Coxtown publications 3. Mercerization- J T Marsh, 1979, B I Publications. 4. Scouring and Bleaching of Cotton- J.T. Marsh, 1979, B I Publications. 5. Dyeing and Chemical Technology of textile Fibres- E.R.Trotman, 		
REFERENCE BOOKS:		
<ol style="list-style-type: none"> 1. Chemical Technology of Fibrous Materials- MIR Publications, 1978. 2. Textile Auxiliaries and Finishing Chemicals- ATIRA Publications.1975 3. Textile Chemistry-Vo. I, II and III R H Peters, Elsewhere Publishing Co. New York. 4. Modern techniques of textile Bleaching- Dyeing, and Finishing, SITRA Publication. 5. Chemical Processing of Cotton, Polyester Cotton Blends- J.R.Modi and A.R. Garde, 1980, TAI Publications. 6. Recent processes of Textile Bleaching, Dyeing and Finishing- S B Srivastava, 1978, SBP Publications. 		

SPINNING TECHNOLOGY LAB-I

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER – III

Laboratory Code	15TXL36	IA Marks	20
Number of Lecture Hours/Week	01Hr Tutorial (Instructions) + 02 Hours Laboratory	Exam Marks	80
		Exam Hours	03

CREDITS – 02

Course Objectives

The objective of this Course is to describe the basic Practical spinning process of Textile Machineries such as Blow Room, Carding. Students acquire the practical knowledge about the machineries used

Laboratory Experiments:**Revised Bloom's Taxonomy (RBT) Level****NOTE: The experiments are to be carried using discrete components only.****Blow Room:****L2, L3, L4**

1. Passage of material through the blow room and different openers and beaters of blow room.

Selection of beater points and study of their design features and to evaluate their efficiencies.

2. Driving arrangements and demonstration of all machineries and calculations of speeds of different parts of each machineries

L2, L3, L4

3. Calculation of cleaning efficiency at all beaters and openers.

L2, L3, L4

4. Study of piano feed regulating motion and calculation of cone drum speed, feed

L4

roller speed and beats/inch.	
5. Production and CV% calculation in Blow Room laps (within and between).	L4
6. Identification of Blow Room process for different mixings, impurities and counts.	L2
Carding:	L2
7. Explanation of Passage of material through revolving flat card.	
8. Speed and draft calculation of different parts of carding with the help of gearing and driving arrangement.	L4
9. Draft constant and its calculation.	L4
10. Draft change pinion calculation and machine operation to get different hank of slivers.	L3
11. Calculation on snap study to analyze neps, sliver variations and efficiency.	L4, L5
12. Settings of different parts and gauges used setup the machines.	L3, L4
13. Comparison between conventional and modern high speed card with respect to production, efficiency and quality of sliver.	L4 ,L5
14. Hank and CV calculation of sliver.	L4
Course Outcome	
On completion of this course, Students will be able to	
1. Learn the practical aspects of the machineries used	

2. Gain knowledge about the process parameters such as Settings, Speeds of Blow room and Carding
3. Will be able to define the actual running of the machineries

Graduate Attributes (as per NBA)

- Engineering Knowledge.
- Problem Analysis.
- Design/Development of solutions.

Conduct of Practical Examination:

1. All laboratory experiments are to be included for practical examination.
2. Students are allowed to pick one/two experiment from the lot.
3. Strictly follow the instructions as printed on the cover page of answer script for breakup of marks.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

FABRIC MANUFACTURING TECHNOLOGY LAB-I
[As per Choice Based Credit System (CBCS) scheme]

SEMESTER – III

Laboratory Code	15TXL37	IA Marks	20
Number of Lecture Hours/Week	01Hr Tutorial (Instructions) + 02 Hours Laboratory	Exam Marks	80
		Exam Hours	03

CREDITS – 02

COURSE OBJECTIVES :

- Recall & Recognize the features passage, production calculation & efficiency of hank winding m/c, cone winding m/c.
- Recall, Recognize & Analyze the non-auto& auto pirn winding, bunch building production and efficiency calculations
- Recognize & Demonstrate Production and efficiency warping machines like Beam and sectional warping machines.
- Recall, Recognize Sizing machine: passage through sow box drying equipment's, head stock
- Recall, Recognize Weft preparation auto & non-auto winding m/c.
- Recognize & Demonstrate & Calculate Production and efficiency calculations.
- Recognize & Demonstrate Drawing - in and denting operations.

Laboratory Experiments:

NOTE: The experiments are to be carried using discrete components only.

Revised Bloom's Taxonomy (RBT) Level

1. Passage of material through hank winding machine Speed, production and efficiency calculations	L1, L2,L4
2. Working on double flanged bobbin winder. Speed, production and efficiency calculations of double flanged winding machine.	L2, L3, L4
3. Passage of material through non-automatic and automatic winding machines. Study of the salient features, speed, production and efficiency calculations.	L1, L2, L4
4. Setting of Tensioners and Slub catchers on winding machine.	L3, L5
5. Passage of material through non-auto pirn winding machine. Adjusting the bunch length, speed, production and efficiency calculations.	L2, L3,L4,L5
6. Passage of material through automatic pirn winding machine. Adjusting the bunch length, speed, production and efficiency calculations.	L2, L3, L4
7. Passage of material through sectional warping machine. Calculation of machine	L2,L4, L5

particulars and production.	
8. Passage of material through Beam warping machine. Calculations related to speed, production and efficiency.	L2, L3, L4
9. Passage of material through sizing machine. Calculations related to speed, production and efficiency.	L2, L3, L4
10. Plan of warp patterns for stripes and check fabrics.	L3,L5, L6
11. Preparation of warp on sectional warping machine and related calculations.	L4,L5
12. Study of different types of sizing ingredients, cooking and mixing beck.	L1,L2,L3
13. Knotting, drawing - in and denting of weavers beam.	L3,L4
14. Identification, reasons and remedies for defects in pirn winding, warping and sizing.	L2,L4, L5
<p>COURSE OUTCOME : On completion of this laboratory course, Students will be able to</p> <ul style="list-style-type: none"> • Recognize & Demonstrate working of yarn preparatory machines like hank winding, cone winding warping and weft winding machines: • Recognize, apply & calculate the production and efficiency of preparatory machines. • Recognize & Demonstrate Sizing machine construction & working, drying of warp and head stock • Recognize, apply& Demonstrate Drawing - in and denting operations, gaiting techniques. 	
<p>Graduate Attributes (as per NBA)</p> <ul style="list-style-type: none"> • Engineering Knowledge. • Problem Analysis. • Design/Development of solutions. 	
<p>Conduct of Practical Examination:</p> <ol style="list-style-type: none"> 1. All laboratory experiments are to be included for practical examination. 2. Students are allowed to pick one/two experiment from the lot. 3. Strictly follow the instructions as printed on the cover page of answer script for breakup of marks. 4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero. 	

CHEMICAL PROCESSING OF TEXTILES LAB-I

[As per Choice Based Credit System (CBCS) scheme]

SEMESTER – III

Laboratory Code	15TXL38	IA Marks	20
Number of Lecture Hours/Week	01Hr Tutorial (Instructions) + 02 Hours Laboratory	Exam Marks	80
		Exam Hours	03

CREDITS – 02

Course Objectives:

1. This subject aims to acquire knowledge of various chemical preparatory process of textiles.
2. Practical knowledge on preparatory process bring more confidence in students and they are exposed to different machineries, recipes and process control.
3. Knowledge on recent developments, ecofriendly process.

Laboratory Experiments:**NOTE: The experiments are to be carried using discrete components only.****Revised Bloom's Taxonomy (RBT) Level**

1. Desizing of cotton yarn/fabric using acids.	L5, L6
2. Desizing of cotton yarn/fabric using enzymes (amylases).	L2, L3, L4
3. Scouring of cotton using alkali method and determination of scouring loss.	L2, L3, L4
4. Degumming of silk using soap-soda/enzymatic methods and determination of degumming loss.	L2, L3, L4
5. Scouring of Wool fibres and determination of scouring loss	L2, L3, L4
6. Scouring of Jute fibres determination of scouring loss	L2, L3, L4
7. Bleaching of cotton using bleaching powder and Sodium hypochlorite	L4, L5
8. Bleaching of cotton using Hydrogen Peroxide.	L2, L3, L4
9. Bleaching of silk and woolen goods.	L2, L3, L4
10. Bleaching of Jute fibres/fabrics.	L4, L5

11. Optical whitening of bleached goods.	L4, L5
12. Mercerization of cotton in taught and slack forms	L4, L5
13 Determination of scouring/bleaching efficiency using cuprammonium fluidity, methylene blue absorption etc	L4, L5
14. Determination of efficiency of mercerized goods using BAN and strength measurements.	L3, L4, L5
Course Outcomes: <ol style="list-style-type: none"> 1. This course helps the students to acquire practical knowledge of various chemical preparatory process. 2. Students are exposed to process control, chemicals and auxiliaries used, machineries. 3. This subject prepare the students work in various chemical industries. 	
Graduate Attributes (as per NBA) <ul style="list-style-type: none"> • Engineering Knowledge. • Problem Analysis. • Design/Development of solutions. 	
Conduct of Practical Examination: <ol style="list-style-type: none"> 1. All laboratory experiments are to be included for practical examination. 2. Students are allowed to pick one experiment from the lot. 3. Strictly follow the instructions as printed on the cover page of answer script for breakup of marks. 4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero. 	