

RAJASTHAN TECHNICAL UNIVERSITY, KOTA



SYLLABUS & SCHEME OF EXAMINATION

M. TECH. Textile Technology

Effective from session: 2012 – 2013

I SEMESTER M. TECH. Textile Technology

Sub. Code	Name of Subject	Credits	Teaching Periods			Duration of Exa	Maximum Marks		
			L	T	P		Internal	End Term	Total
1M TT1	Design of Experiments and Statistical Analysis	5	3	1	-	3	25	100	125
1M TT2	Advances in Fibre Production	5	3	1	-	3	25	100	125
1M TT3	Data Base Management System in Textiles	5	3	1	-	3	25	100	125
1M TT4	Elective-I								
1M TT4.1	Theory and Design of Spinning Machinery	5	3	1	-	3	25	100	125
1M TT4.2	Advances in Pretreatments and Dyeing Technology								
1 M TT5	Design of Spinning, Weaving and Processing Machinery Lab	2	-	-	3	3	60	40	100
Total		22	12	4	3		160	440	600

II SEMESTER M. TECH. Textile Technology

Sub. Code	Name of Subject	Credits	Teaching Periods			Duration of Exa	Maximum Marks		
			L	T	P		Internal -	End Term	Total
2M TT1	Evaluation of Textile Materials	5	3	1	-	3	25	100	125
2M TT2	Technical Textiles	5	3	1	-	3	25	100	125
2M TT3	Project Planning & Cost Management	5	3	1	-	3	25	100	125
2M TT4	Elective - II								
2M TT4.1	Theory and Design of Weaving Machinery	5	3	1	-	3	25	100	125
2M TT4.2	Advances in Textile Printing.								
2 M TT 5	Physical and Chemical Analysis Lab	2	-	-	3		60	40	100
Total		22	12	4	3		160	440	600

III SEMESTER M. TECH. Textile Technology

Sub. Code	Name of Subject	Credits	Teaching Periods			Duration of Exa	Maximum Marks		
			L	T	P		Internal	End Term	Total
3M TT1	Elective - III								
3M TT1.1	Modern Technology of Yarn Production	5	3	1	-	3	25	100	125
3M TT1.2	Advances in Textile Finishing								
3M TT2	Elective - IV								
3 M TT 2.1	Modern Technology of Fabric Production	5	3	1	-	3	25	100	125
3M TT2.2	Energy and Water Conservation in Processing Industries.								
3M TT3	Dissertation Stage - I	4	-	-	2		60	40	100
3M TT4	Seminar	6	-	-	4		90	60	150
Total		20	06	02	06		200	300	500

IV SEMESTER M. TECH. Textile Technology

Sub. Code	Name of Subject	Credits	Teaching Periods			Duration of Exa	Maximum Marks		
			L	T	P		Internal	End Term	Total
4M TT1	Dissertation Stage - II	24			16		300	200	500
Grand Total		88	30	10	28		820	1380	2200

I SEMESTER M. TECH. Textile Technology

Design of Experiments and Statistical Analysis

[1M TT1]

Class : M. TECH. Textile Technology	Evaluation
Schedule per week Lectures : 3L + 1T	Examination Time = Three (3) Hours Maximum Marks = 125 [Internal (25) & End-term (100)]

Contents of the Subject
Sampling techniques, sample size, Principles of experimental design. Selecting a statistical design. Running experiments in Blocks, Latin squares. Factorial Designs & Analysis. Fractional factorial experiments. Use of replicates. Techniques of optimisation. Response surface designs. Statistical principles in data analysis. Fitting data. Linear regression with one, and several variables. Polynomial models. ANOVA. Use of Computers. software packages. Rank correlation, Coefficient of concordance. Sampling inspection. Acceptance sampling : OC curve, Acceptance sampling by variables, Producer risk condition. Control Chart: Average run length, Modified control limits for averages..
SUGGESTED READINGS:-
<ol style="list-style-type: none"> 1. Modern Elementary Statistics – J. Freund., 2006 2. Mathematical Statistics – J. Freund., 1971 3. Practical Statistics for the Textile Industry – Part I & II – GAV Leaf, 1984 & 1987 4. Experimental Designs by Cochran & Cox. 1992 5. Some new three level designs for the study of Quantitative Variables – G E P Box & D W Behnken- Technometrics Vol-2 No-4, Nov 1960.. 6. Design of Experiments – Montgomery.

Advances in Fibre Production

[1M TT2]

Class : M. TECH. Textile Technology	Evaluation
Schedule per week Lectures : 3L + 1T	Examination Time = Three (3) Hours Maximum Marks = 125 [Internal (25) & End-term (100)]

Contents of the Subject
Fibre modifications and evaluation of their properties. Advances in fibre extrusion processes and discussion on structure and properties of the product. Developments in post extrusion operations. New fibres based on performance and functional applicability. High temperature resistant fibres – Nomex, Kelvar, PBO – production, properties, structure and applications. High strength, high modulus fibres – Spectra (UHMWPE) – production, properties, structure and application. Different routes for production of carbon fibres, their structure, properties and end uses. Optical fibres – Different types, Signal losses, their remedy, production and properties their end uses.
SUGGESTED READINGS :-
<ol style="list-style-type: none"> 1. High Performance Fibres – J. W. S. Hearle, 2001 2. Carbon Fibres by Jean Baptiste Donnet & Roopchand Bansal – International Fibre Science & Technology Series, 1990 3. Hand book of Fibres Science & Technology : High Technology Fibres edited – Manachem Lewin & Jack Preston, 1993 4. New Fibres by New Fibres – Second Edition – T. Hongu & Phillips- Wood Head Publishing Ltd., Cambridge, England, 1997 5. Kevlar Aramid Fibres – H. Yang – John Wiley & Sons., 1993

Class : M. TECH. Textile Technology	Evaluation
Schedule per week Lectures : 3L + 1T	Examination Time = Three (3) Hours Maximum Marks = 125 [Internal (25) & End-term (100)]

Contents of the Subject
<p>Introduction - DBMS an overview- Advantages of DBMS, Network, Hierarchical and Relational Model, Levels of abstraction ,Data Independence, Data Models, Instances and schemes, Data independence,Structures of a DBMS, Application Programmers & Data Base administrators - their function.</p> <p>Entity Relationship Model- Entities, Attributes and Entity Sets, Relation and Relationships sets, Features of E-R Model .</p> <p>Database Design - Introduction to Schema Refinement, Functional Dependencies, Normal Forms-First , Second, Third, Boyce code, Fourth and Fifth Normal forms, Multivalued Dependencies.</p> <p>Introduction to ERP- ERP Evolution of ERP, What is ERP? Reasons for the growth of ERP, Secnario and Justification of ERP in India, Evaluation Of ERP, Various Modules Of ERP, Advantage of ERP.ERP and Related Technologies, Business Process Reengineering (BPR), Management Information System (MIS), Executive Information System(EIS), Decision support System (DSS), Supply Chain Management (SCM)</p> <p>ERP Modules, Introduction, Finance, Plant Maintainance, Quality Management, Materials Management,ERP Market, Introduction, SAP AG, Baan Company, Oracle Corporation, People Soft, JD Edwards World Solutions Company, System Software Associates, Inc. (SSA) QAD, A Comparative Assessment and Selection of ERP Packages and Modules.</p>
SUGGESTED READINGS:-
<ol style="list-style-type: none"> 1. ERP Demystified - Alexis Leon, TMH., 2007 2. E-Commerce – David Whiteley, TmH., 2000 3. Enterprise Resource Planning – Alexis Leon, TMH., 2007 4. Information Technology for Management,- Turban-McLean.Wetherbe., 2000 5. SAP R/3 SAP Architecture, Administration, Basis, ABAP. 6. Data Base System Concepts – H. F. Korth and Silberschertj., 1986 7. Fundamentals of Database System – Almasri and Navathe.

Class : M. TECH. Textile Technology	Evaluation
Schedule per week Lectures : 3L + 1T	Examination Time = Three (3) Hours Maximum Marks = 125 [Internal (25) & End-term (100)]

Contents of the Subject
Design principles of modern openers and blenders. Feed Regulation. Theories of carding. Design aspects of high production cards. Drafting force. Theories of drafting. Mechanism of hook removal during drafting. Auto leveling. Combing- effect of lap preparation, fractionating efficiency of comber and its assessment, measurement and improvement, latest development in machine design. Developments in high speed fly frames. Twist flow in Ring Spinning, Spinning Tension. Developments in design of ring travelers. Spindles and high speed ring frame. Automated Spinning. Compact spinning – mechanism and role of process variables.
SUGGESTED READINGS:-
<ol style="list-style-type: none"> 1. Advances in Yarn Spinning Technology – Edited by C.A. Lawrence – Woodhead Publishing Ltd. U.K 2010 2. The Textile Institute Publication - Manual of Textile Technology – Short Staple Spinning Series Vol.I – The Technology of short staple spinning by W. Klein. 1987 Vol.-IV – A Practical Guide to Ring spinning by W. Klein. 1987 Vol.V – New Spinning Systems – W. Klein.1993 Vol.VI - Man-made fibre spinning – W.Klein1994 2. Series publications of NCUTE Training Programs. 3. Textile Progress Series – Textile Institute,Manchester, 1971 4. Fundamentals of Spun Yarn Technology – Carl A. Lawrence, 2002-2003 5. Yarn Production-Theoretical Aspects – P.Grosberg & C.lype. , 1987

Class:M.TECH.TextileTechnology(Technology/Chemistry)	Evaluation
Schedule per week Lectures : 3L + 1T	Examination Time = Three (3) Hours Maximum Marks = 125 [Internal (25) & End-term (100)]

<p>Contents of the Subject</p> <p>Process modifications in Pretreatments - Developments in singeing, desizing, scouring, bleaching and its eco-aspects, size recovery, Eco-friendly peracetic acid bleaching, Eco-friendly retting of Jute, Redox H₂O₂ bleaching, Concept of Eco-friendly stabilizers for H₂O₂ bleaching. Combined operations like desizing-scouring- bleaching, solvent scouring, Hot and ammonia mercerization, add-on mercerization.Use of Biotechnology in Pretreatments- classification of enzymes, Mode of action of enzyme, Factors affecting efficiency of enzyme treatment. Enzyme retted flax using different formulations, influence of enzymatic pretreatment on the colours of bleached and dyed flax fibers, effect of ultrasound on the performance of industrial enzymes used in cotton bio-preparation/bio-finishing applications, Enzymatic degumming, enzymatic H₂O₂ bleaching.</p> <p>Developments in Dyeing - Dyeing and its eco-aspects, new dyes and their advantages. Eco-friendly dyeing with sulphur & vat dyes. New developments in reactive dyes like HF dyes, low and no salt reactive dyes, multifunctional dyes, neutral fixing and acid fixing reactive dyes. Photo chromic dyes, thermo chromic dyes, fluorescent dyes. Natural Dyes - Sources and classification of natural dyes, extraction methods, mordants, dyeing of natural and synthetic fibrous material with natural dyes. Concept, mechanism, methods and technoecconomical features of dyeing with Supercritical carbon dioxide, Ultrasound in dyeing and Low temperature dyeing .</p> <p>Processing of textured man-made fibers. Rapid dyeing techniques, Foam dyeing .</p> <p>Chemistry and process of warp dyeing with indigo, indigo dyeing equipments, dyeing with mixture of indigo and other dyes.</p> <p>Process sequence and machines used for terry towel manufacturing, essential properties of terry towel fabrics,</p> <p>Processing of Lyocell - General properties and uses of lyocell (Tencel).Pretreatment, dyeing and finishing of lyocell. Concept of fibrillisation, itscauses and remedies.</p> <p>Processing of Fabric containing spandex - Properties and uses of spandex fibres and blends. Wet processing of Cotton / Spandex, polyester / Spandex fabrics.</p> <p>SUGGESTED READINGS:-</p> <ol style="list-style-type: none"> 1. Handbook of Textile processing machinery – R.S. Bhagwat 1999 2. Chemical processing of polyester/cellulosic blends – R.M. Mittal and S.S. Trivedi 1983 3. Silk dyeing, printing and finishing – Hurst, George H. 1892 4. Synthetic Dyes- by Gurdeep R. Chatwal, 2009 5. The chemistry of Synthetic Dyes Vol-8 , br K. Venkataraman, 1978 6.The theory of coloration of textiles by C. L. Bird and W. S. Boston. Dyers Company Publication Trust, Bradford, England, 1975

Class : M. TECH. Textile Technology	Evaluation
Schedule per week Practical : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Internal (60) & End-term (40)]

Contents of the Subject
<p>Practice on modern high speed preparatory machines including combing. Assessment and measurement of the productivity & efficiency of these machines. Practice and understanding the design problems associated with the latest Ring and Compact spinning machines available in the market. Study of the latest technique used on modern weaving machines.</p> <p>Principles underlying unconventional weaving machinery picking system: toggle torsion bar picking, air jet nozzle, water jet nozzle, rapier drives. Kinematics of weft population in unconventional weaving machines: air drag theory. Loom timings for shuttle less looms.</p> <p>Study the automation in dyeing machineries, color rooms, on line monitoring of concentration of dye and chemicals. Practice on jet dyeing, continuous dyeing, optimizing dyeing conditions.</p>

II SEMESTER M. TECH. Textile Technology

Evaluation of Textile Materials

[2M TT1]

Class : M. TECH. Textile Technology	Evaluation
Schedule per week Lectures : 3L + 1T	Examination Time = Three (3) Hours Maximum Marks = 125 [Internal (25) & End-term (100)]

Contents of the Subject
Characterization of Fibre : Birefringence, sonic modulus, density measurements, thermal analysis, X-rays (orientation and crystallinity). Yarn Testing: Tensile properties, hairiness, cross-sectional studies and yarn preparation.
Evaluation of spliced yarn and sized yarn. Testing of technical textile; coated fabrics, geo-textiles, filter fabrics. Simulation of knitted and woven structure, comfort properties of fabric, water repellency. Computer colour matching, measurement of U-V protective character of textile material.
SUGGESTED READINGS:- <ol style="list-style-type: none">1. Physical Properties of Textile Fibres – Morton W.E. and Hearle J.W.S. published by The Textile Institute Manchester , 19622. Physical Testing of Textiles by B.P. Saville , 19993. Fibre Microscopy – Stores J.L. – published by London National Trade Press.,20014. Structure / Property relationship in Textile Fibres – Textile Progress Vol.20, No.4 – The Textile Institute, Manchester.5. Textile Yarn – Martindale and Goswami.,19796. Textile Testing & Analysis by B. J. Collier.7. Handbook of Technical Textiles by A. R. Horrocks & S. C. Anand, 20008. Computer colour matching by Shah and Gandhi.

Class : M. TECH. Textile Technology	Evaluation
Schedule per week Lectures : 3L + 1T	Examination Time = Three (3) Hours Maximum Marks = 125 [Internal (25) & End-term (100)]

Contents of the Subject
<p>Introduction: Definition, Textile materials in technical applications.</p> <p>Fibres: Natural and Man-made fibres suitable for technical applications and their relevant properties.</p> <p>Geotextiles: Mechanics of reinforcement, filtration and drainage of soils by geotextiles. Typical applications. Determination of soil particle size and pore size distribution, relations between soil particle and size and pore size distribution for hydraulic applications.</p> <p>Medical textiles: Textiles in various medical applications. Absorbency of textile materials & methods of sterilization; application oriented design of typical medical textiles (e.g. porous graft or trashed tube). Materials used and design procedure for protecting wounds, cardiovascular application, Sutures.</p> <p>Automotive Textiles: Fibres used for automotive applications-upholstery, carpeting, preformed parts, tyres, safety devices, filters and engine compartment items. Brief description for the manufacture and application of these devices or parts.</p> <p>Rigid composites: Three dimensional fabrics and triaxially braided materials for composites.</p> <p>Filtration: Principles and some mathematical models of wet and dry filtrations. Characteristics properties of fibres and fabrics in selective examples of filtration.</p> <p>Ropes and Cordages: Methods of production. Application oriented structure and production of ropes, cordages and twines.</p> <p>Protective clothing: Thermal protection. Ballistic protection. Protection from electromagnetic radiation and static hazards. Protection against micro-organisms, chemicals and pesticides.</p>
SUGGESTED READINGS:-
<ol style="list-style-type: none"> 1. The Textile Institute Advances in Fibre Science – S. K. Mukhopadhyay 2. "Wellington Sears Handbook of Industrial textiles - S. Adanur, Technomic Publishing Co., Inc Lancaster, Pennsylvania ISBN: 1-56676-340-1, 1995. 3. Automotive Textiles - Mukhopadhyay, S.K. and Partridge J.F., Text.Prog, Vol. 29, No.1/2, 1998, ISBN: 1870372212. 4. Technical Textiles - Horrocks, A.R and Anand S, Text.Inst. 1999, ISBN: 1855733854. 5. Handbook of Technical Textiles - A.R. Horrocks., 2000

Class : M. TECH. Textile Technology	Evaluation
Schedule per week Lectures : 3L + 1T	Examination Time = Three (3) Hours Maximum Marks = 125 [Internal (25) & End-term (100)]

<p>Contents of the Subject</p> <p>An overview of capital expenditure, Phase of capital budgeting, Project development cycle. Objectives of investment, decision-making, Risk & return. Identification of investment opportunities – Governmental regulatory framework – Generation & screening of project ideas – Project identifications for an existing company. Market & demand analysis – Information required for market & demand analysis – demand forecasting methods – market planning. Technical Analysis – Material inputs & utilities – Manufacturing process / technology – Plant capacity – location & site – structures & civil works – Machineries & equipments – Project charts & layouts – Work schedule – Need for tendering alternatives. Analysis of Risk – Types & measurement of project risk – Analytical derivation or simple estimation – Sensitivity Analysis – Scenario analysis – Selection of a project-Risk analysis in practice. Project implementation – Forms of project organization – Project planning – project control – Human aspects of project management – Pre-requisites for successful project implementation. Review-Initial review, performance evaluation. Management accounting- concept, need, importance and scope; cost accounting-meaning, importance, methods, techniques and classification of costs, inventory valuation. Budgetary control- meaning, need, objectives, essentials of budgeting, different types of budgets; standard costing and variance analysis (materials, labour); marginal costing and its application in managerial decision making Working Capital- meaning, need, determinants; estimation of working capital need; management of cash; inventory management; receivable management</p> <p>SUGGESTED READINGS:-</p> <ol style="list-style-type: none"> 1. Textile Project Management – A. Ormerod, The Textile Institute Publication.1992 2. Enterpreneurial Development – S.S. Khanta , S. chand & Company Ltd., Delhi – 110 055. 3. Management Accounting - Pandey, I.M., Vikas Publishing House, N.Delhi 4. Introduction to Management Accounting, Horngren & Sundem, Prentice Hall of India, N.Delhi. 5. Management Accounting Principles, Anthony R.N. and Reece J.S., 6th ed., Homewood, Illinois, Richard D.Irwin, 1995. . 6. Accounting: Anthony Robert and Hawkins David, Text & Cases, McGraw Hill, 1999 7. Advanced Cost Accounting – Jain, S.P and Narang, K.L., 1984 8. Financial Management, Kishore, R., Taxman's Publishing House, New Delhi 1975

Theory and Design of Weaving Machinery

[2M TT4.1]

Class : M. TECH. Textile Technology	Evaluation
Schedule per week Lectures : 3L + 1T	Examination Time = Three (3) Hours Maximum Marks = 125 [Internal (25) & End-term (100)]

Contents of the Subject
Theory, measurement and control of yarn tension in unwinding from spinning packages during winding, Tension generators to control yarn tension. Study of warp tension variation during winding. Development in design and operation of modern winding, warping, sizing machines. Theory and design principles of latest automatic controls in size regulation in sizing. Factors affecting size pick up and drying rate in sizing. Expression for drying capacity of sizing machine. Kinematics of loom slay. Picking system elastic model, shuttle checking. Cloth fell position and its applications, beam-driving mechanism, force acting at a floating back roller. Principles underlying unconventional weaving machinery picking system: toggle torsion bar picking, air jet nozzle, water jet nozzle, rapier drives. Kinematics of weft population in unconventional weaving machines: air drag theory i.e. air-jet flows, flow in air guiding system, analysis of yarn tension during unwinding of yarn from drum feeders, yarn flight in air-jet, analysis of yarn motion in air-jet. Loom timings for shuttle less looms.
SUGGESTED READINGS:- 1. Modern Preparation & Weaving Machinery – A. Ormerod, 2004 2. Principles of Weaving - R. Marks & A. T. C. Robinson 1976 3. Warp Sizing – J.B. Smith 4. Textile Maths Vol-III – J.E. Booth, 1977 5. Weaving Technology & Operation – Allan Ormerod, 1995 6. Shuttleless Weaving Machines – O. Talavasek & V. Svaty., 1981

Advances in Textile Printing.

[2MTT4.2]

Class: M.TECH. Textile Technology (Technology/Chemistry)	Evaluation
Schedule per week Lectures : 3L + 1T	Examination Time = Three (3) Hours Maximum Marks = 125 [Internal (25) & End-term (100)]

Contents of the Subject
Digital Printing - Concept, methods of inkjet printing, colour separation, selection of dyes and developments in inks, techno-economical features. Transfer Printing – Concept, selection of dyes and paper, mechanism of dye transfer, process sequences, techno-economical features, various transfer printing machines. Special Printing Effects – Advantages and disadvantages of pigment printing, various developments to overcome the problems, Special print recipes for fashion & garments. Khadi, Metallic, Floc, Plastizol, Reflective, Pearl, Fluorescent Printing, High Density Printing, Puff Printing, Foil Printing, Plastic Printing
SUGGESTED READINGS:- 1. Technology of Textile printing by V. A. Shehna, Vol 4, 2003 2. Digital Printing of Textiles, Ujji. H. Woodhead publishing, 2006. 3. Pigment Printing Hand book –by AATCC, 1995 4. Wool Dyeing and Printing- by Gulrajani and Gupta, 1990

Physical and Chemical Analysis Lab:**[2MTT5]**

Class : M. TECH. Textile Technology	Evaluation
Schedule per week Practical : 3	Examination Time = Three (3) Hours Maximum Marks = 100 [Internal (60) & End-term (40)]

Contents of the Subject.

Testing of technical textile materials. Thermal analysis of textile fibres. Measurement of Birefringence, fibre density, yarn cross-sectional studies and related parameters. Yarn Testing: Tensile properties, hairiness, and yarn preparation.

Methods of analysing damage in textile materials, spectroscopic analysis, infrared spectra of natural and man made fibres, identification of finishing agents using IR spectroscopy, experiments on fluidity, Diffusion coefficients of dyes, Performance of dyes using CCM technique. Evaluation of flame retardants.

III SEMESTER M.TECH Textile Technology

Modern Technology of Yarn Production

[3M TT1.1]

Class : M. TECH. Textile Technology	Evaluation
Schedule per week Lectures : 3L + 1T	Examination Time = Three (3) Hours Maximum Marks = 125 [Internal (25) & End-term (100)]

Contents of the Subject
<p>Causes leading to advent of unconventional spinning systems. Principles and Engineering Design of rotor, air-jet and friction spinning. Fibre properties required for these spinning systems. Structure & property relationship. Effect of raw material and machine variables on spun yarn characteristics of Ring, Air-jet, Rotor and Friction spun yarns. Effect of plying on these yarns.</p> <p>Other unconventional spinning systems, viz. Self Twist, Twist-less, Repco. Integrated, Disc., Parafil, etc- their working principles, properties and end use of yarns spun of these system.</p>
<p>SUGGESTED READINGS:-</p> <ol style="list-style-type: none">1. Advances in Yarn Spinning Technology – Edited by C.A. Lawrence – Woodhead Publishing Ltd. U.K 20102. The Textile Institute Publication - Manual of Textile Technology – Short Staple Spinning Series Vol.I – The Technology of short staple spinning – W. Klein.1987 Vol.-II – A Practical Guide to Opening & Carding – W. Klein. Vol.III – A Practical Guide to Combing & Drawing – W. Klein.1987 Vol.VI - Man-made fibre spinning – W.Klein3. Series publications of NCUTE Training Programs4. 'Fundamentals of Spun Yarn Technology' – Carl A. Lawrence., 20035. 'Spun Yarn Technology' – Eric Oxtoby., 19876. Yarn Production-Teoretical Aspects – P.Grosberg & C.lype.7. Textile Progress Series – Textile Institute, Manchester., 1971

Class:M.TECH.TextileTechnology(Technology/Chemistry)	Evaluation
Schedule per week Lectures : 3L + 1T	Examination Time = Three (3) Hours Maximum Marks = 125 [Internal (25) & End-term (100)]

Contents of the Subject
<p>Application of Nanotechnology in Textiles Nanoscale – Definition, various methods of manufacturing nano materials and their characterization. Nanofibers - Manufacturing, properties and uses of nanofibre, Nanofinishes - Super hydrophobicity and lotus effect, self cleaning, UV protection, Antimicrobial finishes</p> <p>Application of Plasma in Textiles Concept, types of plasma and their generation, Plasma treatment of textile for water and oil repellency, Interfacial engineering of functional textiles for biomedical applications, plasma modification of wool, plasma modification of natural cellulosic fibers, characterization of plasma treated textiles.</p> <p>Development in Finishing Various Low liquor and minimum application techniques in textile finishing, their advantages and limitations, wrinkle free finishing – concept of wet and moist cross linking, various eco-friendly resin finishes, Bio-Finishing, Concept of UV-A and UV-B, factors affecting UV protection. Various UV- protection finishes and their evaluation, antimicrobial finishes – mode of action, factors affecting, various antimicrobial finishes. Developments in textile finishing such as soil release, flame retardant, antistatic, fluoro chemicals, silicone finishes.</p> <p>Wash down effects on denim Stone wash,, enzyme wash, combined stone and enzyme wash, acid wash, ball blast, whiskering, sand blast, ice wash.</p> <p>Developments in finishing machineries. Developments in stenters and physical finishing machines</p>
<p>SUGGESTED READINGS:-</p> <ol style="list-style-type: none"> 1. Technology of finishing – J.T. Marsh, 1948 2. Technology of finishing – Vol. X – Dr. V.A. Shenai & Dr. Saraf 1990 3. Chemical processing of polyester/cellulosic blends – R.M. Mittal and S.S. Trivedi. 4. Silk dyeing, printing and finishing – Prof. M.L. Gulrajani. 5. Garment Finishing & Care Labelling by S.S. Satsangi, Usha Publishers, 53-B/AC-IV, Shalimar Bagh, New Delhi. 6. Plasma technologies for textiles – R. Shishoo 7. Nano fibres and Nano technology in textiles, Brown P.J, Woodhead Publishing 2007.

Class : M. TECH. Textile Technology	Evaluation
Schedule per week Lectures : 3L + 1T	Examination Time = Three (3) Hours Maximum Marks = 125 [Internal (25) & End-term (100)]

Contents of the Subject
<p>Yarn quality and preparation requirements for high speed weaving machines. Performance of yarn in air-jet, weaving machine. Weft yarn preparation for the shuttles weft insertion; the type of weft supply packages, the creels and its setting, weft consumption, weft tensioning, weft unwinding for individual picks, weft feed systems, weft measuring system. Ballistic weft insertion; theory of weft insertion, the weft carrier acceleration, the free flight of the weft carrier, the carrier breaking. Theory of weft insertion of projectile, developments in torsion rod picking motion, geometrical aspects of torsion rod, energy for picking, projectile flight & checking, developments in projectile weaving machine.</p> <p>Theory of weft insertion of air - jet picking, nozzles design, developments in air - jet machine.</p> <p>Theory of weft insertion of rapiers, developments in rapier heads, developments in rapier drives, developments in rapier weaving machine.</p> <p>Theory of weft insertion of water - jet picking, developments in water - jet machine.</p> <p>Multi phase weaving machine – M8300</p> <p>Developments in high speed shedding devices, beat-up, warp let off and take-up motions.</p> <p>Control systems – weft colour control, warp and weft monitor systems, lubrication system, intelligent monitoring system. Quick style change..</p>
SUGGESTED READINGS:-
<ol style="list-style-type: none"> 1. Weaving Technology & Operation – Allan Ormerod.,2004 2. Shuttleless Weaving Machines – O. Talavasek & V. Svaty.,1981 3. Principles of Weaving - R. Marks & A . T. C. Robinson.,1976 4. Handbook of Weaving - SULZER - Sabit Adanur,2001 5. Handbook of Technical Textiles - A.R. Horrocks.,2000

Class:M.TECH.TextileTechnology(Technology/Chemistry)	Evaluation
Schedule per week Lectures : 3L + 1T	Examination Time = Three (3) Hours Maximum Marks = 125 [Internal (25) & End-term (100)]

Contents of the Subject
<p>Water/Energy consumption in the industry, Quality and quantity requirements, reasons for conservations, approach to conservation, measurements of water/ energy consumption, target figures for water/ energy consumption, water energy conservation measures, consequence of water/energy conservation, energy conservation in generating steam, sizing, bleaching, mercerization, dyeing, printing, finishing and drying.</p> <p>Alternate energy sources, waste heat recovery.</p> <p>Processes for energy conservation e.g. E. Control, Hot Mercerization, Supercritical carbon-dioxide dyeing technique etc.</p> <p>Right first time approach.</p>
SUGGESTED READINGS:-
<ol style="list-style-type: none"> 1. Economy, Energy & Environment in Textile Wet Processing-Edited by S. S. Trivedi 2. Textile Energy & Waste Seminar-Textile Institute, 1997 3. Environmental Issues and Technological option for Textile industry. Edited by R. B. Chavan. 4. Environmental Success: America Textile Industry, AATCC Symposium-1996 5. Energy Conservation in Industries – Vol.I & II, Centre of Plant Engg.Services Hydrabad.

Dissertation Stage - I**[3M TT3]**

Class : M. TECH. Textile Technology	Evaluation
Schedule per week Lectures : NIL	Maximum Marks = 100 [Internal (60) & End-term (40)]

Contents of the Subject
Dissertation should be based on the review of literature on any topic relevant to textile technology/textile engineering/textile chemistry (should be helpful for selecting a probable title of dissertation). Each student has to prepare a write up in "A4" size sheets and submit it in duplicate as the term work. The student has to deliver a seminar on dissertation topic in front of the faculty members of the department and his/her classmates. The faculty members, based on the quality of the work and preparation and understanding of the candidate, shall do an assessment of the dissertation internally – jointly. Some marks should be reserved for the attendance of the student in the seminars of the others students.
SUGGESTED READINGS: - Research journals

Seminar**[3M TT4]**

Class: M. TECH. Textile Technology	Evaluation
Schedule per week Lectures : NIL	Maximum Marks = 150 [Internal (90) & End-term (60)]

Contents of the Subject
Seminar should be based on the literature survey on any topic relevant to textile technology/textile engineering/ textile chemistry (should be helpful for selecting a probable title of dissertation). Each student has to prepare a write up of about 15 pages of "A4" size sheets and submit it in duplicate as the term work. The student has to deliver a seminar talk in front of the faculty members of the department and his/her classmates. The faculty members, based on the quality of the work and preparation and understanding of the candidate, shall do an assessment of the seminar internally – jointly. Some marks should be reserved for the attendance of the student in the seminars of the others students.
SUGGESTED READINGS: - Research journals

IVSEMESTER M.TECH Textile Technology**Dissertation Stage - II****[4M TT1]**

Class : M. TECH. Textile Technology	Evaluation
Schedule per week Practical : 3	Maximum Marks = 500 [Internal (300) & End-term (200)]

Contents of the Subject
Each student individually will carry out a project of an experimental and/or theoretical nature in one of the main branches of textile technology/textile engineering/ textile chemistry and present his findings in a systematic manner in the Project Report duly approved and signed by his Supervisor / Guide (to be nominated by the Principal, MLVTEC). Each candidate would submit three (3) typed copies of the Project Report to Principal, MLVTEC at least 15 days before the commencement of fourth semester examination. One copy of the Project Report will be returned to the candidate after viva-voce examination. The original report and second copy will be retained by the concerned Department / Institution and the Supervisor respectively.

