

MAHARSHI DAYANAND UNIVERSITY, ROHTAK
SCHEME OF STUDIES AND EXAMINATION
B.TECH (TEXTILE CHEMISTRY) SEMESTER-III
'F' Scheme w.e.f 2010-11

Course No.	Course Title	Teaching Schedule				Marks of Class work	Examination		Total Marks	Duration of Exam
		L	T	P	Total		Theory	Practical		
TT-201-F	Textile Raw Materials	3	1	-	4	50	100	-	150	3
TC-201-F	Physical & Organic Chemistry	3	1	-	4	50	100	-	150	3
TC-203-F	Yarn Formation	3	1	-	4	50	100	-	150	3
TC-205-F	Polymer & Fibre Chemistry	3	1	-	4	50	100	-	150	3
ME-217-F	Thermal Science	3	1	-	4	50	100	-	150	3
HUM-201-F	Engineering Economics	3	1	-	4	50	100	-	150	3
	Practicals									
TC-207-F	Yarn Formation Practical	-	-	3	3	50	-	50	100	4
TC-209-F	Qualitative Analysis of Organic Compounds	-	-	3	3	50	-	50	100	4
ME-219-F	Machine Drawing	-	-	2	2	50	-	50	100	4
TT-213-F	Fibre Microscopy & Identification	-	-	2	2	50	-	50	100	4
Total		18	6	10	34	500	600	200	1300	

TT-201-F TEXTILE RAW MATERIALS (COMMON WITH TT/FAE)

L	T	P	Class work	:	50
3	1	-	Examination	:	100
			Total	:	150
			Exam duration:		3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

Unit I

General definitions and important terminologies related to textiles; Classification of fibres; Essential and desirable properties of textile fibres and their role in final products; Advantages and disadvantages of natural and manmade fibres. Flow charts showing processes involved in textile industry.

Cotton: Geographical distribution, structure and properties (physical and chemical); Different Varieties including organic as well as Bt cotton and their properties; Applications.

Unit II

Bast and leaf fibres such as jute, hemp, sisal and ramie etc: Geographical distribution, extraction, properties and their uses.

Varieties of natural silk, rearing of silk worm, properties and uses of various types of silk; silk reeling, throwing and weighing.

Unit III

Varieties, sorting and grading of wool, chemical and physical properties of wool, processes involved in the removal of impurities from raw wool; numbering systems of woollen and worsted yarns.

General principles of manufacturing of man made fibres.

Unit IV

Brief outline of the manufacturing processes of important man-made fibres, viz. rayons (Viscose and Acetate), polynosic, tencel, nylons, polyester, acrylics, polypropylene, polyolefins, polyacrylonitrile and some technical speciality fibres like spandex/lycra etc (only flow charts); their Important physical and chemical properties and applications.

Reading List

Title	Author
Handbook of Textile Fibres	J Gordon Cook
Textile Fibres	HVS Murthy
Manmade Fibres	RW Moncrieff
Manufactured Fibre Technology	V B Gupta & V K Kothari

TC-201-F PHYSICAL & ORGANIC CHEMISTRY

L T P
3 1 -

Class work : 50
Examination : 100
Total : 150
Exam duration: 3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

Unit I

Stereochemistry: Isomerism and their classification, Structural, geometrical and optical isomerism; E, Z & R, S nomenclature.

Basic concept of organic molecules: Introduction, Inductive effect, Mesomeric effect, Electrometric effect, Hyper-conjugation, Resonance, Effect of these factors on the physical and chemical properties of substance.

Unit II

Homolytic and heterolytic fission of a covalent bond. Preparation, classification, structure and stability of Free radical carbocation, carbanions and carbene. Electrophile and nucleophile /

Organic Reactions and mechanism: Substitution Reactions, Types, Addition reactions, Types, Elimination reactions, Types and Rearrangement reactions. Directive influence of functional group in mono-substituted benzene.

Unit III

Carbohydrates: Introduction, Classification. Properties, structure of Cellulose, Glycogen.

Chemical Kinetics: Rate of reaction. Definition of rate of reaction according to the law of mass action and rate law, Molecular reaction, order of reaction, Types of order of reaction; Derivation of rate constant for first order and second order reaction. Methods of determination of order of reaction and numericals related to them.

Unit IV

Colloidal Chemistry: Classification of particles i.e. colloids, crystalloids, suspension, Colloids Classification, preparation, purification and properties; Gels and emulsions; Application of Colloids.

pH of solution, Buffer Solution, Henderson's Equation and Numerical related to them. pH measurement by indicator and electrometric methods. Control and utility of pH in textile wet processing.

Reading List

Title

Principles of Physical Chemistry
Text Book of Physical Chemistry
Organic Chemistry (Vol I, II)
Organic Chemistry

Author

Puri, Sharma & Pathania
Samuel Glastone
IL Finar
Singh & Mukherjee

TC-203-F YARN FORMATION (COMMON WITH FAE)

L	T	P	Class work	:	50
3	1	-	Examination	:	100
			Total	:	150
			Exam duration:		3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

Unit I

Introduction to objectives of processes like ginning, mixing and blending.

Introduction to various preparatory processes involved in the production of yarn viz. opening and cleaning (blow room and card), drawing (draw frame), combing (comber) and rove formation (speed frame) with the objectives of each process.

Unit II

Introduction to different processes involved in the production of yarn viz. conventional (ring spinning) and unconventional (rotor, air-jet and friction spinning etc) with the objectives of each.

Properties and end uses of different types of yarns such as ring spun, rotor spun, friction spun and air-jet spun etc.

Unit III

Objectives of plying and twisting of spun and filament yarns.

Objectives and process description of reeling.

Brief description of fancy yarns: ply cable yarn; core spun yarn, sewing threads, slub yarn, grindle, mélange yarns etc.

Unit IV

Essential properties of a sewing thread.

Concept of yarn quality and its importance,

Yarn numbering systems and calculations pertaining to conversions,

Reading list

Title	Author
Spun Yarn Technology	Eric Oxtoby
Textile Science	Corbmann
Short Staple Spinning Series (Textile Institute)	W. Klein

TC-205-F POLYMER & FIBRE CHEMISTRY

L T P
3 1 -

Class work : 50
Examination : 100
Total : 150
Exam duration: 3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

Unit I

Terms and definitions: Scope of polymer chemistry, plastics, fibres and rubbers. Basic determinants of polymers, Structure and property correlation. Chemistry of important monomers. Basic concepts of high polymers. Classification of polymerization reaction (addition, condensation) - their mechanism and kinetics with special reference to polyesters, polyamides. Ionic polymerization and their kinetics, living polymer. Phenol-formaldehyde, urea-formaldehyde, epoxy resins, Co-polymerization.

Unit II

Physical methods of polymerization (bulk, emulsion, solution, suspension, radiation, gaseous etc). concept of amorphous and crystalline polymer. Concept and determination of glass transition temperature. Thermal effect of polymers. polymer viscosities and their determination, DSC, DTA, TGA, Gel chromatography.

Polymer rheology, Viscous, visco-elastic and elastic properties of fibre. Rubber elasticity.

Unit III

Chemical composition and constitution of cellulosic fibres. Chemistry of degradation products of cellulose and their determination. The action of physical conditions and chemicals on cotton. Physical changes in Fibres after Mercerisation. Multicellular vegetable fibres.

Chemistry of regenerated man-made fibre. Cuprammonium rayon (lyocell, HWM Rayon, etc) and polynosic fibres. Preparation of cellulose acetate.

Unit IV

Chemical composition and constitution of wool and Silk.

Chemistry of nylon and other polyamide, Polyaramide (Kevlar, Nomex, etc) fibres. Chemistry of polyester and acrylonitrile fibres. Elastomeric (Spandex) fibres.

Effect of heat, radiation and chemicals on important natural and man-made fibres.

Reading List

Title	Author
Textile Chemistry Vol I & II	R H Peter
Textile Chemistry in the Laboratory	Bruce E Hartsuch
Organic Chemistry of Synthetic High Polymers	Robert W Lenz
Text Book of Polymer Science	Fred W Billmeyer
Polymer Science & Technology of Plastics	P Ghosh

& Rubber

ME- 217-F THERMAL SCIENCE (Common to TT & TC)

L	T	P	Sessional	: 50 Marks
3	1	-	Theory	: 100 Marks
			Total	: 150 Marks
			Duration of Exam	: 3 hrs.

NOTE: Examiner will set 9 questions in total, with two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each section.

Unit I

Basic Concepts and First Law of Thermodynamic: Macroscopic and Microscopic Approaches, Thermodynamic system, Thermodynamic properties, Equilibrium, State, Path, Process and Cycle, Quasi-static, Reversible and Irreversible Processes, Concept of Thermodynamic Work and Heat, Zeroth Law of Thermodynamic and its utility, First Law of Thermodynamics, Internal Energy and Enthalpy, PMMFK, Limitation of First Law, Steady Flow Energy Equation, First Law applied to Non-Flow Process, Steady Flow Process and Transient Flow process, Throttling process and Free Expansion Process

Unit II

Second Law of Thermodynamic and Entropy: Kelvin- Plank and Clausius Statement and their Equivalence, PMMSK, Carnot Cycle, Carnot Heat Engine, Carnot Theorem and its Corollaries, Entropy, Clausius Inequality, Principal of Entropy Increase, Temperature Entropy Plot, Entropy Change in different Processes, Third Law of Thermodynamics, Availability, Ir-reversibility

Unit III

Pure Substance and Air Conditioning: Pure Substance and its properties, Phase and Phase Transformation, Saturated and Superheated steam, Solid-Liquid-Vapour Equilibrium, T-V, P-V, P-T plot during Steam Formation, T-S and H-S Diagrams, Dryness fraction, Throttling and Separating Calorimeter, Psychrometric Chart, Psychrometric Terms, System of Humidification in Textile Industry, Cooling and Dehumidification, Heating and Humidification, Air Conditioning System

Unit IV

Fuel and Steam Generator: Different types of Fuels, Calorific Value, Bomb Calorimeter, Combustion Equation of Fuel, Orsat Apparatus, Boiler Efficiency and Heat Losses in Boiler, Heat Balance Sheet, Boiler Drought, Height of Chimney, and High pressure Boilers

Reading List

Title	Author
Heat Engineering	VP Vasaandani & DS Kumar
The Theory & Practice of Heat Engines	DA Wrangham
Thermodynamics applied to Heat Engines	EH Lewit
Air Conditioning in Textile Mills	SP Patel & K Subramaniyan
Engineering Thermodynamics	P K Nag
Thermodynamics and Thermal Engineering	J Selwin Rajadurai

HUM-201-F ENGINEERING ECONOMICS

(Common to CSE, ME, ECE, BME, EE, EEE, E&I, I&C, IT, CE, TT, FAE, TC)

L T P
3 1 -

Class Work : 50 Marks
Theory : 100 Marks
Total : 150 Marks
Duration of Exam. : 3 Hrs.

NOTE: Examiner will set 9 questions in total, with two questions from each section and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each section.

Section-A

Definition of Economics - various definitions, Nature of Economic problem, Production possibility curve Economic laws and their nature. Relation between Science, Engineering, Technology and Economics.

Concepts and measurement of utility, Law of Diminishing Marginal Utility, Law of equi-marginal utility - its practical application and importance.

Section-B

Meaning of Demand, Individual and Market demand schedule, Law of demand, shape of demand curve, Elasticity of demand, measurement of elasticity of demand, factors effecting elasticity of demand, practical importance & applications of the concept of elasticity of demand.

Meaning of production and factors of production; Law of variable proportions, Returns to scale, Internal and External economics and diseconomies of scale.

Section-C

Various concepts of cost - Fixed cost, variable cost, average cost, marginal cost, money cost, real cost opportunity cost. Shape of average cost, marginal cost, total cost etc. in short run and long run.

Meaning of Market, Types of Market - Perfect Competition, Monopoly, Oligopoly, Monopolistic Competition (Main features of these markets)

Section-D

Supply and Law of Supply, Role of Demand & Supply in Price Determination and effect of changes in demand and supply on prices.

Nature and characteristics of Indian economy (brief and elementary introduction), Privatization - meaning, merits and demerits. Globalisation of Indian economy - merits and demerits. Elementary Concepts of VAT, WTO, GATT & TRIPS agreement.

TEXT BOOKS:

1. Principles of Economics: P.N. Chopra (Kalyani Publishers).
2. Modern Economic Theory – K.K. Dewett (S.Chand)

REFERENCE BOOKS:

1. A Text Book of Economic Theory Stonier and Hague (Longman's Landon)
2. Micro Economic Theory – M.L. Jhingan (S.Chand)
3. Micro Economic Theory - H.L. Ahuja (S.Chand)
4. Modern Micro Economics : S.K. Mishra (Pragati Publications)
5. Economic Theory - A.B.N. Kulkarni & A.B. Kalkundrikar (R.Chand & Co.)
6. Indian Economy: Rudar Dutt & K.P.M. Sundhram

TC-207-F YARN FORMATION PRACTICAL (COMMON WITH FAE)

L T P
- - 3

Class work : 50
Examination : 50
Total : 100
Exam duration: 4 hrs

Discussion and demonstration of the various machines and of manufacturing processes involved in converting fibres to yarn viz. mixing, blending, opening, cleaning, carding, drawing, combing, rove formation, spinning, doubling etc.; Introduction to unconventional spinning machines/processes; Rotor spinning, Air-jet spinning and Friction spinning etc.; Simple Calculations pertaining to these machines/processes.

TC-209-F QUALITATIVE ANALYSIS OF ORGANIC COMPOUNDS

L	T	P
-	-	3

Class work	:	50
Examination	:	50
Total	:	100
Exam duration:		4 hrs

Detection of extra elements (i.e. Nitrogen, Sulphur & Halogenes and functional groups (i.e. Carboxyl, Phenolic, Alcoholic, Aldehydic, ketonic, Esteric, Amides, Amines, Anilides, Thioamides, Nitro, Carbohydrate and hydrocarbons

Test for Aromaticity of unsaturation in organic compounds,

Determination of melting and boiling point of the organic compounds,

Formation of derivatives of organic compounds,

Determination of melting / boiling point of the derivatives

ME-219-F MACHINE DRAWING (Common to TT & TC)

L	T	P	Sessional	: 50 Marks
	-	2	Theory	: 50 Marks
			Total	: 100 Marks
			Duration of Exam	: 4 hrs

Technical terminology and drawing conventions, Conventional representation of spring, gears, and bearings etc., Screw threads – forms of threads, triangular and square. Riveted joints: forms and proportion of rivets joints, lap and butt joints, Shaft coupling- muff, flange and flexible coupling.

Bearings – journal, bush, thrust and pivot bearings. Gears and train of gears, Cams: construction and linkage.

TT-213-F FIBRE MICROSCOPY & IDENTIFICATION (Common with TT/FAE)

L T P
- - 2

Class work : 50
Examination : 50
Total : 100
Exam duration: 4 hrs

Principle of microscopy, Microscopic identification of fibres, preparation and mounting of specimen for longitudinal view, Cross-section cutting. Microtomy - cork method, metal plate method, Hardy's Microtome, Mountants and reagents for fibre microscopy; Identification of fibre by burning as well as solubility tests. Standard scheme of analysis of homogenous fibre blends by physical and chemical methods, Qualitative and quantitative determination of components.

Preparation of reagents used for chemical analysis.

MAHARSHI DAYANAND UNIVERSITY, ROHTAK
SCHEME OF STUDIES AND EXAMINATION
B.TECH (TEXTILE CHEMISTRY) SEMESTER-IV
‘F’ Scheme w.e.f 2010-11

Course No.	Course Title	Teaching Schedule				Marks of Class work	Examination		Total Marks	Duration of Exam
		L	T	P	Total		Theory	Practical		
TT-202-F	Man-Made Fibre Production	3	1	-	4	50	100	-	150	3
TC-202-F	Unit Organic Process & Chemical Engg	3	1	-	4	50	100	-	150	3
TC-204-F	Fabric Formation	3	1	-	4	50	100	-	150	3
TC-206-F	Preparatory Wet Processing	3	1	-	4	50	100	-	150	3
TT-210-F	Computer Aided Designing	3	1	-	4	50	100	-	150	3
MA-201-F	Applied Statistics & Operations Research	3	1	-	4	50	100	-	150	3
	Practicals									
TC-208-F	Fabric Formation Practical	-	-	3	3	50	-	50	100	4
TC-210-F	Preparatory Wet Process Lab	-	-	3	3	50	-	50	100	4
TC-212-F	Analytical Chemistry Lab	-	-	2	2	50	-	50	100	4
TT-218-F	Computer Aided Textile Design	-	-	2	2	50	-	50	100	4
Total		18	6	10	34	500	600	200	1300	

TT-202-F MAN-MADE FIBRE PRODUCTION (common to TC & TT)

L T P
3 1 -

Class work : 50
Examination : 100
Total : 150
Exam duration: 3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

UNIT 1

General definitions related to man-made/manufactured fibres. Introduction to manufacturing processes of these fibres. Study of various spinning systems: melt, wet & dry spinning – basic principles. Brief details of spinning head, spinneret, quench chamber, drying chamber & coagulation bath. Spin finish application.

UNIT – II

Regenerated fibres: Viscose rayon – detailed manufacturing process with reactions at each stage. Polynosics, Super high wet modulus rayons, Brief manufacturing processes of lyocell and tencel fibres.

UNIT – III

Polyacrylonitrile: Addition of comonomers, continuous suspension, polymerization technique. Solution spinning techniques, Coagulation bath variables, Macrovoid generation and their remedies, Effect of spinning variables on structure and properties of gel and final fibres.

Polypropylene: Polymerisation technique (suspension & gas phase), Superactive catalysts, spinning of filaments, Major drawbacks and their possible remedies.

UNIT – IV

Polyethylene terephthalate: Polymerisation technique (batch & continuous), side reactions, degradation reactions – their control, Production of filament yarns and staple fibres, Brief description of manufacturing technique of high tenacity polyethylene terephthalate.

Nylon 6 & nylon 66: Polymerisation techniques in VK tube (batch & continuous), side reactions, Integrated continuous process for nylon 66, Filament spinning technique.

TC-202-F ORGANIC PROCESS & CHEMICAL ENGINEERING

L T P
3 1 -

Class work : 50
Examination : 100
Total : 150
Exam duration: 3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

Unit I

Structural features of organic substances. Resonance and its effects. Reactivity of organic compounds. Definition of unit process and unit operation. Study of following unit organic processes with special reference to reaction, reagents used. Physico-chemical factors involved. One or two methods of manufacture with flow sheet for each process. Nitration, sulphonation, oxidation, reduction, ammonolysis, halogenation, alkylation. Diazotization and coupling.

Unit II

Manufacture of dye intermediates based on above processes.
Definition and scope of chemical engineering, Unit operations of chemical engineering, material balance and molecular units, mole fractions, Gas laws, simple calculations based on these laws.

Unit III

Mechanical separation: Introduction to screens and screen analysis, types of screening equipment.
Size reduction: Crushing and grinding machinery. Introduction to theory of size reduction, power consumption.
Drying: Classification of dryers. Special drying machinery used in textiles, Equilibrium moisture content, bound, unbound and free water.
Evaporation: Evaporator types and their description, accessories, capacity, heat and material balance, evaluation of boiling point.

Unit IV

Distillation: Terms and definitions, vapour-liquid equilibrium, boiling point diagrams, equilibrium distillation and differential distillation, steam distillation.
Simple treatment of fluid flow, heat transfer, heat exchangers.
Fuels and combustion, treatment of water.
Corrosion and material of construction
Industrial hazards in chemical industry.

Reading List

Title	Author
Unit Processes in Organic Syntheses	RH Groggins
Chemistry of Synthetic dyes	K Venkataraman
Introduction to Chemical Engineering	WL Badger
Unit Operations of Chemical Engg	WL McCabe
A Text Book of Engineering Chemistry	MM Uppal
A Glimpse on the Chemical Technology	RR Chakraborty

of Textile Fibres

TC-204-F FABRIC FORMATION (common with FAE)

L	T	P
3	1	-

Class work	:	50
Examination	:	100
Total	:	150
Exam duration:		3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

Unit I

Introduction to warp and weft preparatory processes in relation to production of fabrics with flow charts.

Winding : Objectives of winding, Flow of material through a winding machine, different devices of a winding machine viz. yarn clearers, yarn tensioners, waxing device, knotter, splicer, balloon breaker, automatic bobbin replacement. Brief description of Random and Precision winding, assembly winding, rotary motion of drum and traverse motion.

Unit II

Warping: Objectives of warping, Direct and sectional warping: flow of material through these machines, steps of preparation of beam on these machines. Types of creel.

Sizing: Objectives of sizing. Brief introduction to Types of sizing viz aqueous and solvent slasher sizing machine, foam sizing, sinter roller sizing, hot melt sizing and single end sizing, Sizing ingredients: adhesives and different categories of additives.

Unit III

Pirn winding and Drawing-in: Objectives and flow of material through these operations. Shuttle Looms: Definition of handloom, plain loom, and automatic loom. Introduction to various mechanisms of a loom viz. primary, secondary and auxiliary motion

Unit IV

Shuttleless looms: Classification, Their advantages over shuttle looms. Brief description of Sulzer projectile loom, rapier looms, air-jet looms, water jet looms and their salient features.

Fabric Analysis: Simple calculations for fabric weight per unit area, linear weight, cover and cover factors.

Reading List

Title	Author
Principles of Weaving	Marks & Robinson
Cotton Yarn weaving	ATIRA
Textile Science	Corbmann
NCUTE's Manual	

TC-206-F PREPARATORY WET PROCESSING

L T P
3 1 -

Class work : 50
Examination : 100
Total : 150
Exam duration: 3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

Unit I

Impurities in fibres and greige fabrics (Cotton, Wool, Silk and Synthetic fibre) Preparatory sequences required for their removal. Chemistry and technology of singeing, desizing, scouring and bleaching of natural and man-made fibre fabrics and their blends.

Unit II

Machines used for batch wise and continuous scouring and bleaching. Mechanism of bleaching by various bleaching agents such as bleaching powder, sodium hypochlorite, hydrogen peroxide, sodium chlorite etc.

Unit III

Combined preparatory processes and energy conservation, Economics of preparatory processes. Faults in scouring and bleaching and their prevention. Methods used for determination of degradation during scouring and bleaching.

Determination of oxi-cellulose and hydrocellulose. Determination of efficiency of various preparatory processes.

Unit IV

Physical and chemical aspects of mercerization, Efficiency of mercerization, Machines for yarn and fabric mercerization, hot mercerization and Liquid ammonia treatment.

Auxiliaries used in scouring, bleaching and mercerizing.

Reading List

Title	Author
Textile Chemistry	RH Peters
Mercerizing	JT Marsh
Textile Scouring and Bleaching	ER Trotman
Technology of Bleaching & Mercerizing	VA Shenai

TT-210-F COMPUTER AIDED DESIGNING (Common to TT & TC)

L	T	P	Class work	:	50
3	1	-	Exam	:	100
			Total	:	150
			Exam Duration	:	3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

Unit I

Fundamentals of CAD: Definition, History, Hardware and Software requirements of CAD, Design Process, Application, Use, Creating the manufacturing Data base and benefits of CAD.

Hardware in CAD: Introduction, Design workstation, Graphics terminal, input and output devices, central processing unit and secondary storage.

Unit II

Computer Graphics Software and Database – Introduction, Software configuration of a graphic system, functions of a graphic package, transformations, Database structure and content, wire frame versus solid modeling, CAD features and CAD integration. Drawing aids, free hand sketching, Enhancement drawing. Feature based design process.

Unit III

Introduction to Computer Graphics: Computer Graphics and its applications, Computer Graphics Hardware and Software. Two dimensional graphics primitives – Point and Lines, Line drawing algorithms: DDA, Bresenham's; Circle drawing algorithms: midpoint circle drawing algorithm, Bresenham's circle drawing algorithm.

Unit IV

Introduction to Software Packages:

Introduction to Auto-CAD: Features, Basic Drawing Techniques: Drawing Line, Circle, Rectangle, Arc, Polyline, Ellipse, Elliptical Arc, Polygons, Donuts, Corner rounding, Chamfering, Displacing, Duplicating, Removing Objects.

Introduction to Corel Draw: Features and basic drawing techniques.

Introduction to Photoshop: Features and basic drawing techniques.

Reading List

Title	Author
Computer Aided Design & Manufacturing	Mickle P Groover, Emory W. Zimmers Jr
Computer Graphics Principles & Practices	James D Foley, Andeies Van Da Shvan K Feiner Steven, John F Hughes
Computer Graphics	Donald Mearn & M Pauline Baker
Mastering AUTOCAD 2004 & AUTOCAD LT	George Omura

MA-201-F APPLIED STATISTICS & OPERATIONS RESEARCH (common to TT & TC)

L T P
3 1 -

Class work : 50
Examination : 100
Total : 150
Exam duration: 3 hrs

NOTE: Examiner will set 9 questions in total, with two questions from each unit and one question covering all sections which will be Q.1. This Q.1 is compulsory and of short answers type. Each question carries equal mark (20 marks). Students have to attempt 5 questions in total at least one question from each unit

Unit I

Measures of Dispersion: Range, quartile deviation, standard deviation, moments, skewness and Kurtosis (definition, properties and associated numerical only)

Regression and Correlation: Karl Pearson's coefficient of correlation, rank correlation and line's of regression, curve fitting (linear, parabolic, and exponential)

Unit II

Theory of Probability: The concept of probability, additive and multiplicative laws of probability (Statements and associated numerical only)

Probability Distributions: Random variate, mathematical expectation, theorems on expectation, discrete and continuous probability distributions (definition and problems only). Univariate Binomial, Poisson and Normal distribution (properties and applications)

Unit III

Sampling Theory: Population and sample, types of sampling, sampling distribution of means and proportions (definition only)

Tests of Hypothesis and Significance: Definition of statistical hypothesis, null hypothesis, type I and type II errors and level of significance. Tests of significance for large and small samples (discussion) problem based on X^2 test for goodness of fit, t-test, F-test and Analysis of variance (one way and two way classifications)

Unit IV

Operations Research: Linear programming problem (formulation and solution by graphical approach only). Transportation problem including time minimizing problems, Basic Assignment problem, sequencing problems (n jobs, 2 machines and n jobs, m machine problems)

Project scheduling by PERT/CPM: Definition of network, critical path, floats, finding of critical path and floats.

Reading List

Title	Author
Mathematical Statistics	Ray and Sharma
Business Statistics	Gupta & Gupta
Theory and problems of probability and Statistics	Murray P Spiegel
Operation Research	P.K. Gupta, Manmohan
Operations Research for Management	Gupta & Sharma
Higher Engineering Mathematics	B.S. Grewal

TC-208-F FABRIC FORMATION PRACTICAL (common with FAE)

L T P
- - 3

Class work : 50
Examination : 50
Total : 100
Exam duration: 4 hrs

Basic principles of woven fabric analysis: estimation of data for cloth reproduction, Identification of yarns and materials used in their construction.

Weave analysis, Sett, Cover factor, Count and weight calculations for simple and compound woven structures, Specifications of standard woven fabric.

Discussion and Demonstration of various machines and of manufacturing processes involved in converting yarns to fabric winding, warping, sizing, Drawing-in, weaving by Hand looms, Plain Looms.

Automatic Shuttle Looms, Shuttleless Looms and Knitting, Passage of material through them and brief study of their essential components and mechanisms.
Simple production and efficiency calculations pertaining to these processes,

TC-210-F PREPARATORY WET PROCESSING LAB

L	T	P
-	-	3

Class work	:	50
Examination	:	50
Total	:	100
Exam duration:		4 hrs

Desizing of cotton by enzymatic and oxidative method. Scouring by caustic soda boil, enzymatic and solvent scouring. Bleaching using Sodium hypochlorite and hydrogen peroxide and assessment process of bleaching process. Two stage and single stage preparatory processes. Estimation of available chlorine in hypochlorite bath and peroxide content in hydrogen peroxide bath. Scouring and bleaching of wool. Degumming and bleaching of silk. Scouring and bleaching of polyester and blends. Mercerization of cotton by various methods and its evaluation.

TC-212-F ANALYTICAL CHEMISTRY LAB

L T P
- - 2

Class work : 50
Examination : 50
Total : 100
Exam duration: 4 hrs

Use of pH meter. Identification of important intermediates in dyes, e.g. aniline, benzidine, nitroanilines, beta naphthol, etc. A few estimations from these intermediates. Determination of copper number, methylene number and carboxyl group in degraded cellulose, determination of barium number. Damage in wool, analysis of free formaldehyde. Paper chromatographic technique and thin layer chromatography their application in textiles.

TT-218-F COMPUTER AIDED TEXTILE DESIGNING (common to TT & TC)

L T P
- - 2

Class work : 50
Examination : 50
Total : 100
Exam duration: 4 hrs

Introduction to graphical representations: live graphics, pixel graphics, Graphic systems and peripherals. Graphic standards/formats, file conversion initiatives, drawing simple geometric figures. Implementation of various aspects and commands of Corel Draw including 2D and 3D graphic design, other Design Software (Textile and Garments) and drawing objects such as Line, Circle, Arc, Ellipse, Elliptical Arcs, Xlines, Rays, Multiline, Polylines, Rectangles, Polygons, Donuts and Spline etc.

Introduction to Textile Design Software, Uses of various tools, Selection and creation of motifs, uses of colour tools, knowledge of repeats, selection and creation of fancy yarns, selection and creation of different types of weaves, Development of dobby and jacquard designs using CAD software.