

MAHARSHI DAYANAND UNIVERSITY, ROHTAK
SCHEME OF STUDIES AND EXAMINATION
B.TECH (FASHION & APPAREL ENGG) 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
FA-201-F	Traditional Indian Embroideries & Textiles	3	1	-	4	50	100	-	150	3
TC-203-F	Yarn Formation	3	1	-	4	50	100	-	150	3
FA-207-F	Apparel Production-I	3	1	-	4	50	100	-	150	3
MA-201-F	Applied Statistics & Operations Research	3	1	-	4	50	100	-	150	3
HUM-201-F	Engineering Economics	3	1	-	4	50	100	-	150	3
	Practicals									
TC-209-F	Yarn Formation Practical	-	-	3	3	50	-	50	100	4
FA-205-F	Fashion Sketching	-	-	3	3	50	-	50	100	4
FA-207-F	Traditional Indian Embroideries & Textiles	-	-	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/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

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

Handbook of Textile Fibres
Textile Fibres
Manmade Fibres
Manufactured Fibre Technology

Author

J Gordon Cook
HVS Murthy
RW Moncrieff
V B Gupta & V K Kothari

FA-201-F TRADITIONAL INDIAN EMBROIDERIES AND TEXTILES

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

Basic know-how embroidery techniques: Requirements of embroidery. Tools and Equipment required for embroidery

Unit II

Sample preparation with basic embroidery stitches and their derivatives like chain stitch; stem stitch, darning stitch, Herring-bone, open chain, satin, button-hole, bullion knot, Lasydaisy stich

Unit III

Working with Indian Traditional Embroidery with special reference to fabric, embroidery threads, colors, colors, stitches, and motifs-

- a) Chickankari - Lucknow
- b) Phulkari - Punjab
- c) Kanthas - Bengal
- d) Applique work – Orissa and Gujarat

Unit IV

Sampling and Sourcing of Traditional Indian Textiles with the special reference of materials, colors, motifs and production processes -

- a) Ikat and Patola
- b) Kalamkari
- c) Chanderi
- d) Kota
- e) Brocades
- f) Bandhani
- g) Block Printed Textiles

Preparation of atleast two samples with machine embroidery techniques

Reading list

Title

Complete Guide to Needle work
The Dictionary of Needle work
Ethnic embroidery of India
Vandana embroidery

Author

Readers Digest
Sophia Cauteild and Blanche Saward
Usha Shrikant
Arora's

Modern embroidery series
Artistics embroidery designs
Folk designs from India

Ritu
Pradumna and Rosalba Tana

TC-203-F YARN FORMATION (COMMON WITH 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

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	W. Klein

FA-203-F APPAREL PRODUCTION – I

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

Global Textiles and Apparel industry: History and evolution. Indian Textiles and Apparel Industry: History and Evolution .Indian Garment industry vis-à-vis leading countries. Apparel manufacturing countries: their features level of technology, product mix.

Unit II

Cutting: Objectives and methods of cutting; the planning, drawing, and reproduction of the marker, requirement of marker planning, marker plan efficiency, methods of marker planning and use.

Aids and Tool equipment for cutting- Band knife, clamp, click press, electrical cloth notcher, Straight knife cutter, Circular knife, portable rotary knife cutter, Cutting Board, Cutting Table, Drill, Pattern perforator, razor blade, Scissors, Shears, Face to face spreader, Manual spreader, one way spreader, Tubular knit spreader.

Unit III

Understanding of various fabrics and its effect on spreading and cutting techniques in relation to quality and productivity, the spreading of fabric to form a lay, requirement of spreading and different spreading method.

Tracing and marking Terminology - Chalked marking, chalked thread, color coding, pin marking, tailors tacks, thread tracing.

Unit IV

Types of pattern – Commercial pattern, Drafted pattern, Draped pattern, Graded pattern, Production pattern, Trade back pattern

Pattern Lay-out – Border design fabric, check fabric, Diagonal design fabric/ Diagonal print fabric, Diagonal weave fabric, Irregular design fabric, Knit fabric, Large print fabric, Light reflecting fabric, Napped fabric, Balanced plaid, pile fabric, unbalanced plaid, uneven plaid, plastic fabric, Even stripe, Uneven stripe.

Reading List

Title	Author
Clothing Technology	Carr and Latham
Apparel Industry Magazine	
World Clothing Manufacturer	

MA-201-F APPLIED STATISTICS AND OPERATIONS RESEARCH

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 χ^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

Mathematical Statistics

Business Statistics

Theory and problems of probability and Statistics

Operation Research

Operations Research for Management

Higher Engineering Mathematics

Author

Ray and Sharma

Gupta and Gupta

Murray P Spiegel

P.K. Gupta, Manmohan

Gupta and Sharma

B.S. Grewal

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-209-F YARN FORMATION PRACTICAL (COMMON WITH TC)

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.

FA-205-F FASHION SKETCHING

L T P
- - 3

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

Usage of different dry and wet colour mediums in sketching e.g. shading, filling etc.

Normal figure proportions, Grid theory for formation of fashion figure.

Fashion Figure proportions, Fashion figure in different views, as Front View, 3/4th View, Back View, Side View.

Flashing of the fashion figure in different views.

Movement figures - principles to form a movement figure, sketching of the movement figures in various postures /body positions.

Variations of body parts - Arms, Hands, legs, Feet. Facial figure proportions - Features, Hairstyles.

Developing Silhouettes – draping, fold lines, prints etc.

Photo analysis, Fabric rendering, Simple illustration on fashion figures.

**FA-207-F TRADITIONAL INDIAN EMBROIDERIES AND TEXTILES
PRACTICAL**

L	T	P
-	-	2

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

Practice of different basic embroidery stitches.

Usage of different basic stitches for embroidery and sampling of textiles of different states as mentioned with respective references to material, colour, thread, stitches and motifs :

UP – Chikankari

Panjab – Phulkari embroidery

Bengal – Kanthas, Baluchar

Kashmir - Kashida, Shawls

Karnataka-Kasuti

Gujrat –Bandhani, Sindh and Kutch Embroidery

Andhra Pradesh – Kalamkari, Pochampali

Orissa – Ikat

Himachal Pradesh – Chamba Rumal

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

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 (FASHION & APPAREL ENGG) SEMESTER-IV
'F' Scheme w.e.f 2010-11

Subject Code	Course Title	Teaching Schedule				Marks of Class work	Examination		Total Marks	Duration of Exam
		L	T	P	Total		Theory	Practical		
FA-202-F	Evolution of Clothing & Fashion	3	1	-	4	50	100	-	150	3
FA-204-F	Colour and Design Concepts	3	1	-	4	50	100	-	150	3
TC-204-F	Fabric Formation	3	1	-	4	50	100	-	150	3
TT-208-F	Fabric Structure	3	1	-	4	50	100	-	150	3
FA-206-F	Apparel Merchandising	3	1	-	4	50	100	-	150	3
FA-208-F	Apparel Production-II	3	1	-	4	50	100	-	150	3
	Practicals									
TC-208-F	Fabric Formation Practical	-	-	3	3	50	-	50	100	4
FA-210-F	Colour and Design Lab	-	-	3	3	50	-	50	100	4
FA-212-F	Elementary Garment Manufacturing Lab	-	-	2	2	50	-	50	100	4
FA-214-F	Design Ideas and Fashion Illustration	-	-	2	2	50	-	50	100	4
Total		18	6	10	34	500	600	200	1300	

FA-202-F EVOLUTION OF CLOTHING AND FASHION

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

Origin of clothing. Objectives of clothing and costumes, Main archetypes of costumes, Principles of history of fashion. Theories of clothing-Protection, adornment, modesty and combined need theory etc.

Fashion and its meaning, Principles and history of fashion, Classification of fashion. Fashion product Life cycles. Sources of Fashion, Factors affecting fashion movement like cultural, socio-psychological, etc.

Unit II

Effect of various factors such as communication, industry, economy, sports etc on fashion. Fashion leadership theories. Important fashion capitals, National and International fashion designers, National and International fashion markets and fashion weeks.

Unit III

Indian history of costumes: Concept and comparison of costumes of all stages of pre-hispanic and medieval period, Study of Costumes, jewellery, footwear, hairstyles etc. in India in different periods as – Vedic and post vedic period, Maurian Period, Gupta period Kushan and Kanishka period.

Unit IV

Global history of costumes: Concepts and history of classical costumes in Greek civilization and Roman civilization. History of costumes in Egyptian and Byzantine civilization. History of costumes in the western world starting from the origin up to the Reign of Charles and Louis with the emphasis on famous fashion centers and famous fashion designers. Important national and international fashion designers.

Reading List

Title

The guide to historic costumes
Inside Fashion Business
Inside Fashion Design
Fashion: From Concept to Consumers
Understanding today's Fashion

Author

Karen Baclaw Ski
Kitty G.Dickerson
Sharon Lee Tate
Gini Stephon Frings

FA-204-F COLOUR AND DESIGN CONCEPTS

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

COLOUR – Concept and specifications of colour, Light and colour phenomenon, Additive and Subtractive combinations, Colour theories as light theory, pigment/ Brewster colour theory. Colour wheel – primary, secondary, sub-secondary and tertiary colours, Rainbow colours. Colour combination techniques in fabric and garments. Psychological effects of colour, Warm and Cool colours. Colour harmony. Definition of Colour as per C.I.E., Tristimulus value, Hue and Chroma; Color gamut

Unit II

Colour combination techniques in fabric and garments. Colour contrast in fabric and garments. Application of colour combination and harmony in designing of clothing/fabric. Modification of colours as formation of tint, shades and coloured grays etc. Colour intensity charts. Outline for the movement of colours in fashion with the factors affecting the choice of colour. Elements of design of a motif : line, dot, curve, colour and texture. Different Types and their applications.

Unit III

Composition of designs Geometric ornamentation, conventional treatment of natural and artificial forms, adoption and reproduction of earlier designs. Construction of symmetrical figures, Reversing inclined figures.

Arrangement of figures - unit-repeating design, the drop device, drops reverse designs, sateen system of distribution (with reference to half drop, diamond base, ogee base, rectangular base lines). Construction of designs from incomplete repeat.

Unit IV

Study of Pattern:– historical precedents. Symmetry – principle concepts, perspectives and its application, classification of motifs, border patterns, all over patterns, Counterchange motifs, border patterns and all over patterns.

Reading List

Title

Watson's Textile Design and colour
Colour mixing Bible
Colour: right from the start

Author

Watson
Watson – Guptill Publication
Watson – Guptill Publication

TC-204-F FABRIC FORMATION (common with 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

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

Principles of Weaving
Cotton Yarn weaving
Textile Science
NCUTE's Manual

Author

Marks & Robinson
ATIRA
Corbmann

TT-208-F FABRIC STRUCTURE (common with 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 I

Basic Concepts: Importance of fabric structure, Classification of fabrics, Notation of Weave, drafting plan, peg plan and denting.

Simple Weaves: plain weave and its derivatives, ornamentation,

Unit II

Twill weave and its derivatives, ornamentation, effect of twist on prominence of twill lines, Sateen and Satin and their extensions. Crepe weave, diamond,

Unit III

mockleno, Cork-screw, honey comb, huck-a-back, bedford cords, welt and pique fabrics.

Unit IV

Decorative Weaves: Extra warp and weft figuring, Backed cloth, Double cloth, treble and multiply belting structures.

Draft, peg plan and denting plan for all simple and decorative weaves, Particulars of common varieties of these fabrics.

Reading List

Title

Textile Design and Colour
Watson's Advanced Textile Design
Grammar of Textile Design
Woven Cloth Construction

Author

Watson
W Watson
H Nisbet
Marks and Robinson

FA-206-F APPAREL MERCHANDISING

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

Merchandising: Concept and definition. Uniqueness of apparel merchandising. Different components and activities of merchandising—line, planning, line development and line presentation Fashion forecasting and its importance. Factors influencing fashion, Role of a merchandiser in an apparel industry, Essential qualifications of a merchandiser.

Unit II

Concept of retailing and wholesaling. Classification of retailer and wholesaler. Function performed by distribution channel members. Decision making in retailing. Pricing consideration and pricing strategy. Factors affecting pricing strategy. Setting up and changing of price. Terms and definitions used in pricing. Pricing strategy commonly adopted by an apparel merchandiser. Mode of disposition of unsold merchandise.

Unit III

Product line planning. Importance of planning, Different steps involved in product line planning. Different approaches of merchandise planning: Top -Down and Bottom –up, Approach and contemporary line planning. Relative merits and demerits of different approach. Concept and definition of assortment planning. Objective of assortment planning. Importance of balanced assortment. Product line development. Various ways of product line development. Line presentation and its importance in retailing. Visual merchandising.

Unit IV

Budgeting –concept and definition. Importance of budgeting. Various steps involved in budgeting. Dollar And unit control system. Integrating dollar and unit concept. Planning of inventory and reorder point. Cost associated with inventory. Economic order quantity.

Reading List

Title	Author
Apparel Merchandising	Martin Kunj
Fashion Merchandising and Marketing	Cynthia R. Easterling and Marian H. Jernigan
Fashion: From Concept to Consumer	Gini Stephens Fring
Fashion Buying	Helen Goworek
Fashion Marketing	Tony Hines

FA-208-F APPAREL PRODUCTION-II

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

General introduction and an overview of sewing room operations, History of Sewing, Stages and evolution of Sewing machineries, Components of Sewing machine. Brief description of commercial, specialized Sewing machine for specialized applications in apparel industry, Care and maintenance of Sewing machines.

Unit II

Needles – Types of needles for Textile and Non textile materials, Hand and Sewing machine needles, Metallurgy and Shapes of Needles, Needle cutting Index, Damage to fabric by needle heating. Sewing Threads – Fibre types, thread composition – staple, continuous, core-spun, Thread finishes, Thread packages, Thread Sizing, Thread cost, Thread Properties and Seam Performance.

Unit III

Seam Classifications- Notations and applications, Terminologies – Seam Allowance, Seam Let out, Extended Seam Allowances, Rolled Seam edges. Differentiation between Exposed and enclosed seams, Inside and Outside Curved Seams, Stitched and Fused Seams, Stitched and Glued Seams.

Seam Finishes – Definition and Requirement, Types of Seam Finishes – Book Seam Finish, Net Bound Seam Finish, Single ply bound seam finish, Double stitched seam finish, Glued seam finish, pinked seam finish.

Unit IV

Hand Stitches- Introduction to hand stitches, Different hand stitches – Back stitch, Half back stitch, Modified back stitch, Blanket stitch, Blind stitch, Button hole stitch, Catch stitch, Blind catch stitch, Felling stitch, Overhand stitch, Padding stitch, Pick stitch, Running stitch, Saddle stitch, etc

Machine stitches- Blind stitch, Chain stitch, Double needle machine stitch, Hemi stitch, Lettuce edging, Lock stitch, Zigzag machine stitch, Over edge machine stitch, Purl edging, Picot edging, Safety Stitch, Scallop over edge, Shirring stitch, Elasticised shirring.

Sewing Problems- Damage to fabric along the stitch line, Seam pucker, Problems related to stitch formation.

Reading List

Title

Apparel manufacturing handbook
Clothing Technology

Author

Jacob Solinger
R. L. Friend

Clothing Technology
Apparel Industry magazine
World Clothing Manufacture

Carrand Latham

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

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,

FA-210-F COLOUR AND DESIGN PRACTICAL

L T P
- - 3

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

Specification of color with hue, value and chroma, color combinations according to pigment theory of colour. Arrangement of the primary, secondary and intermediate colours in the Brewster's theory. Colour illusions , warm and cool colour effects, Modification of pigment colour with formation of tint, shades and coloured grays etc, Colour and gray intensity charts.

Types of lines, dots and curves and their effects, To produce floral, geometrical, abstract and border designs. Enlargement and reduction of designs. Simple Weave and colour effects. Compound colour and weave effects – stripe colour and weave effect, Check colour and weave effect, Special colour and weave effect, figured colour and weave effect. Placement of figures and motifs – half drop, double ½ drop, diamond base, ogee base, rectangular, horizontal, vertical etc.

FA-212-F ELEMENTARY GARMENT MANUFACTURING LAB

L	T	P
-	-	2

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

Introduction to different aids, tools and equipments for cutting and their applications as well. Preparation of different types of pattern and pattern layout

Selection for different types of needle according to stitching components.

Selection procedure for different types of sewing and embroidery threads. Utility of different Aids and tools for Garment Construction, Basting Operation. Study of sewing machineries, Different tools and Work aids, Application of different trims and components. Study of Fusing and pressing machine procedure

FA-214-F DESIGN IDEAS AND FASHION ILLUSTRATION

L T P
- - 2

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

Designing and sketching of different types of fashion details: necklines, sleeves, collars, pockets, yokes, skirts, waistlines, pleats, tucks, plackets etc.

Developing fabric textures like velvet, tie and dye, batik, denim, fur, leather, net, satin, organdie, etc.

Illusion in garments: line, print, colour and silhouette

Designing of various garments from the following categories: Children wear, Ladies' wear, Men's wear, Evening wear, Nightwear, Kitchen wear, summer wear, winter wear and party wear, etc.

Advanced designing of the garments based upon innovative/motivational designing e.g. electronics, sports, jewelry, modules, camouflage, etc.

MAHARSHI DAYANAND UNIVERSITY, ROHTAK
SCHEME OF STUDIES AND EXAMINATION
B.TECH (FASHION & APPAREL ENGG) SEMESTER-VI
'F' Scheme w.e.f 2011-12

Course No.	Course Title	Teaching Schedule				Marks of Classes	Examination		Total Marks	Duration of Exam
		L	T	P	Total		Theor	Practical		
TC-302-F	Dyeing of Textiles	3	1	-	4	50	100	-	150	3
TT-304-F	Textile & Garment Testing	3	1	-	4	50	100	-	150	3
FA-306-F	Garment Production Machines & Equipment	3	1	-	4	50	100	-	150	3
FA-308-F	Knitted Garment Technology	3	1	-	4	50	100	-	150	3
FA-310-F	Apparel Marketing & Merchandising	3	1	-	4	50	100	-	150	3
TT-312-F	Structure & Properties of Textiles	3	1	-	4	50	100	-	150	3
	Practicals									
TC-314-F	Dyeing & Computer Color Matching Lab	-	-	2	2	50	-	50	100	4
TT-316-F	Textile & Garment Testing Lab	-	-	3	3	50	-	50	100	4
FA-318-F	Apparel Design Lab	-	-	2	2	50	-	50	100	4
FA-320-F	Apparel Construction Lab-II	-	-	3	3	50	-	50	100	4
Total		18	6	10	34	500	600	200	1300	

TC-302-F DYEING OF TEXTILES (COMMON WITH 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

General methods of dyeing. Important classes of dyes. e.g. direct, acid, basic, vat, azoic, sulphur, reactive and disperse dyes etc., Application of dyes on natural, regenerated (Viscose, Polynosic, modal, Loycell) fibres

Unit II

Application of dyes on Man Made fibres (Polyester, Nylon, Acrylic and etc.), yarns, fabrics and garments.

Unit III

Chemical auxiliaries used in dyeing. Colour measurement and fastness (light, washing, perspiration, sublimation, chlorine, etc.) properties.

Unit IV

Dyeing of blends, P/C, P/W, P/V etc. Mass colouration. Pigment dyeing. Dyeing of denim using Indigo dye, Pigment dyeing technology, factors affecting dyes build-up on cellulosic material, continuous Indigo dyeing range, new Indigo vetting and dyeing techniques. Rectifying and Stripping of dyes from substrate,

Reading List

Title	Author
Technology of Dyeing	V A Shenai
Dyeing and Chemical Technology of Textile Fibres	E R Trotman
A glimpse of the Chemical Technology of Textile Fibres.	R R Chakraverty

TT-304-F TEXTILE & GARMENT TESTING

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 testing and its importance, Standard atmospheric conditions for testing and its effect on test results. Testing of yarn strength, elongation, twist, evenness and hairiness. Fabric dimensions measurement – length, width, thickness, weight/area, thread/length, and crimp.

Unit II

Tensile strength and elongation: Definition of different units, tensile strength and elongation, work of rupture, tearing strength, bursting strength. Serviceability: Snagging test, Pilling test, Abrasion resistance.

Unit III

Comfort: Water vapor repellency, Wicking properties, Air permeability, Thermal insulation and wettability. Fabric handle: Bending length, Crease recovery, Drape, Low stress mechanical properties. FAST, Kawabatta Evaluation System.

Unit IV

Garment Testing: Dimensions, Seam strength, Seam slippage, Adhesion between interlining and fabric, shrinkage, zippers, buttons, snap fasteners and other general garment properties . Needle Cutting/Yarn severance.

Reading list

Title	Author
Principles of Textile testing	J.E Booth
Textile Testing	V.K. Kothari
Apparel quality Control	V.K. Mehta
Physical Testing of Textile	Saville

FA-306-F GARMENT PRODUCTION MACHINES & EQUIPMENT

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

Overview of the Garment Manufacturing processes, Introduction to the latest advancements in the Garment manufacturing processes.

Fabric cutting Process: Pre-requisites for the fabric cutting. Tools and equipment needed for the cutting process. Advancements in the fabric cutting technology.

Unit II

Garment assembly processes: Basics of sewing, Functional parts of sewing machines (SNLS): Feed mechanisms, Run-in-ratio, Effect of sewing process on the sewing thread strength.

Principle, mechanism and utility of following machines: Interlock machine, Overlock machine, Double needle Lock stitch and chain stitch sewing machines, Bar-tacking machine, Feed off the arm, Button attaching and buttonhole making machine and computerized embroidery machines.

Unit III

Study of sewing needle temperature: Factors affecting and remedial measures, Methods for the needle temperature measurement.

Study of the measurement of the sewing forces and pressure during sewing.

Study of the measurement techniques of the sewing thread tension on the sewing machine: SNLS and overlock machines.

Applications of Programmable logic circuits (PLC) in the Garment manufacturing processes.

Robotics: Basic analogy, its applications, scope and limitations in the Garment Industry.

Unit IV

Pressing and Fusing process and equipment. Handling of garments between different processes in the apparel industry. .

Reading list

Title	Author
Knitted Clothing Technology	Brackenburry
The Technology of Clothing Manufacture	Harold Carr, Barbara Latham
Introduction to Clothing Manufacture	Gerry Cooklin
Apparel Production	Jacob Solinger
Robotics & Automation in the Textile Industry	M.G.Mahadevan
Fashion Production Terms	Debbie Ann Giocello & Berle

FA-308-F KNITTED GARMENT TECHNOLOGY

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 Knitted Garments- types and flowchart including the steps of production. Fully Cut garments – spreading – hand and machine spreading, types of lays. Marking – manual and computerized marking Cutting devices as die-cutter. Hand shears, laser cutting, etc. Cut stitch shaped – Fitting blocks as easy fitting and close fitting blocks. Consideration of visual stretch, stretch in action, etc. Shaping of various garments, e.g., in body sleeve angles, etc., Cutting in case of cut stitch shaped garments.

Unit II

Fully fashioned garments – Concepts of use of basic forms i.e., circle, bell, and balloon, triangle, overlays in the generation of a garment shape. Broader classification of integral garments. Fashioning for shaping, fashion frequency. Most commonly used fashion details- Necklines, sleeves, etc.

Unit III

Integral garments – Basic techniques as course shaping Wales shaping, tubular knitting, running-on, change of stitch type, casting -off, etc.

Machine knitted integral garments as berets,, half hose, upper and lower bodice garments as Jacket, Wagnall garment, Tubular garment, etc.

Unit IV

Different types of stitches, Commonly used stitch in knitted garment assembly as single, double, three thread, lock stitch and covering stitch. Run-in ratios and application of each in Linking and Mock Linking. Linking machine and Cup seamer. Quality control of knitted garments.

Reading list

Title

Author

Knitting Technology	Spencer
Knitting Clothing Technology	Brackenbury
Fabric form and flat cutting	Winfred Aldrich

FA-310-F APPAREL MARKETING & MERCHANDISING

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

Exploration of Fashion Industry, Marketing and Careers within the industry, Core components, Primary markets, Producers of material, Secondary markets, Design and Production, Present scenario of Textile and Apparel industry in India. Fashion Marketing concept, Marketing environment.

Unit II

Domestic Vs International Marketing, Challenges for International Marketing, International Marketing environment, Identifying foreign apparel markets, International marketing mix – PLC model, Pricing decision, Channels of distribution,, Promotion mix in International context, Modes of entering foreign market for apparel exports, Merits and demerits of each method, Terms of payment

Unit III

Exports- Export procedure and documentation, Export assistance – various schemes, sources of information, export promotion council etc., export finance,

Unit IV

Export houses- working of export houses, categories- star trading export houses, etc. Outsourcing merchandising, visual merchandising, Business process off shoring/ outsourcing. Concept of supply chain management. India's leading export houses, Trends in apparel industry, Foreign trade agreements related to the garment industry

Reading List

Title	Author
International Marketing Management	Varshney and Bhattacharya
Nabhi's publication on Export	Govt. Handbook
International Marketing	Onkvisit and Shaw
International Marketing	Cateora

TT-312-F STRUCTURE AND PROPERTIES OF FIBRES

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

Structure and Properties of Ring, Rotor, DREF spun yarns, multifilament and textured yarns. Importance of Yarn structure in relation to different mechanical properties of Apparel Fabrics. Cloth setting theories: Ashenurst's, Armitage's, Law's, Brierley's and Peirce's theory: its basic seven equations and idea of jamming.

Unit II

Tensile property of fabrics: tensile curve for fabrics and geometrical changes during tensile deformation, factors affecting tensile strength of fabrics, Bending property of fabrics: Different bending stiffness parameters by cantilever testing, Bending hysteresis testing and different parameters measured by it, Bending hysteresis curve, Factors affecting bending stiffness of fabrics

Unit III

Shear stiffness of fabrics: problems during shear testing and their remedies. Shear hysteresis curve, Spring- friction block model of shear behaviour. Creasing of fabrics: Mechanism of creasing, different motions within fabric structure while creasing. Factor affecting crease resistance and crease recovery of fabrics.

Unit IV

Comfort of fabrics, different constituents of comfort. Flow of heat, moisture and air through textile material, Factors affecting thermal insulation, moisture propagation and air permeability of fabrics. Drapability of fabrics, Drape testing, drape parameters and factors affecting drape behaviour. Introduction to the term Tailorability and Formability for apparel fabrics. Handle of fabrics. Objective evaluation of fabric handle. Constituent properties of handle.

Reading List

Title	Author
Textile Yarns-Technology, Structure and Applications	Goswami etal
Structural Mechanics of Fibres, Yarns and Fabrics	Hearle etal

TC-314-F DYEING AND COMPUTER COLOUR MATCHING LAB

L	T	P	Class work	:	50
-	-	2	Examination	:	50
			Total	:	100
			Exam duration:		4 hrs

Dyeing of Cotton, Rayon, and Flax by direct, reactive, sulfur, vat, azoic dyes. Dyeing of Wool and Silk by acid, metal complex dyes, Nylon with acid dyes, Carrier, HTHP, Thermosoling dyeing of PET, Dyeing of Acrylic with basic dyes, Dyeing of Cotton/Polyester and Polyester/Viscose blend. After treatment of direct dyes, Rectification and Stripping of dyes. Tie-dyeing. Identification of dyes on substrate. Measurement of fastness properties, Perspiration, light, washing, rubbing, etc. Computer colour matching, Familiarization with the principles and working of computer color matching instrument, Making of database of dyes, shade matching, shade correction, colour difference, measurement, shade sorting.

TT-316-F TEXTILE AND GARMENT TESTING

L	T	P	Class work	:	50
-	-	3	Examination	:	50
			Total	:	100
			Exam duration:		4 hrs

Testing of single yarn strength, elongation, CSP, yarn twist and evenness
Testing of fabric tensile strength, elongation, air-permeability, bending stiffness, tear strength, crease recovery, abrasion resistance, pilling resistance, Drape.
Testing of seam strength, seam slippage and other general garment properties

FA-318-F APPAREL DESIGN LAB

L	T	P	Class work	:	50
-	-	2	Examination	:	50
			Total	:	100
			Exam duration:		4 hrs

Principle of dart manipulation by (i) Slash and spread method (ii) Pivotal transfer method
Style variations of dart manipulation – pleats, tucks, gathers, dart clusters, radiating darts, terminating darts
Commercial paper patterns- symbols used in commercial patterns, envelopes for commercial paper patterns, guide sheet and other relevant information

FA-320-F APPAREL CONSTRUCTION LAB -II

L	T	P
-	-	3

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

Flat pattern technique- drafting, developing pattern, designing and construction of garments of children, men and women using different construction and decorative features. Handling of different types of fabrics in the above garments.

Analysis of different garments- Men's wear, women's wear, kid's wear

Different parts of a garment , different operational stitch of a garment, Line balancing system, SAM calculation, Layout setting procedure.

MAHARSHI DAYANAND UNIVERSITY, ROHTAK
SCHEME OF STUDIES AND EXAMINATION
B.TECH (FASHION & APPAREL ENGG) SEMESTER-VII
'F' Scheme
EFFECTIVE FROM THE SESSION 2012-13

Course No.	Course Title	Teaching Schedule				Marks of Class work	Examination		Total Marks	Duration of Exam
		L	T	P	Total		Theory	Practical		
FA-401-F	Printing of Textiles	3	1	-	4	50	100	-	150	3
FA-403-F	Textile and Apparel Costing	3	1	-	4	50	100	-	150	3
FA-405-F	Automation in Garment Industry	3	1	-	4	50	100	-	150	3
FA-407-F	Computer Aided Designing	3	1	-	4	50	100	-	150	3
FA-409-F	Fashion Selection	3	1	-	4	50	100	-	150	3
FA-411-F	Indian Business Environment	3	1	-	4	50	100	-	150	3
FA-413-F	Printing Lab	-	-	3	3	50	-	50	100	4
FA-415-F	Apparel Design by CAD	-	-	3	3	50	-	50	100	4
FA-417-F	Garment Industry Practice	-	-	-	-	-	-	300	300	4
FA-418-F	Seminar	-	-	2	2	-	-	-	-	-
FA-419-F	Project Work (Mid Term Evaluation)	-	-	2	2	-	-	100	100	4
Total		18	6	10	34	400	600	500	1500	

FA-401-F PRINTING TECHNOLOGY

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

Different methods and styles of printing of natural and synthetic fabrics, machinery involved: Block, Roller, Rotary & Screen, Transfer Printing.

Unit II

Design making and screen exposing - Table, Flat-bed, Rotary screen. Ink-jet printing, Xerographic printing, Lithographic printing, etc.

Unit III

Printing with reactive dyes and pigments.

Special effects like – Batik, Tie and dye.

Unit IV

Some special printing: Wax prints, Java prints, Fancy prints, Bleeder style, Crimp style, Burnt-out style, etc.

Reading List

Title	Author
Technology of printing	VA Shenai
Textile Printing Second annual Symposium	R B Chavan

FA-403-F TEXTILE AND APPAREL COSTING

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 Cost Concept: Classification of cost (Fixed, Variable, Semi-variable and Total Cost), Cost elements (direct, indirect), planning and storage of materials, pricing and control of materials, computation and control of labour cost, Remuneration and incentives to labour. Over head costs: Classification and accumulation, allocating service department costs, distribution and absorption, marketing and administration, depreciation and miscellaneous.

Unit II

Methods of costing: Single or output costing, job order cost system, introduction to other methods of costing. Cost control techniques: standard costing, variance analysis (Materials and labour, overheads, sales and marketing). Cost control and cost reduction. Research and development cost: cost of product design, R & D budget, accounting treatment.

Unit III

Costing in textile industry: Cost structure, raw material cost, labour cost and other expenses. Yarn realization, determination of cost per kg of yarn, per meter of fabric. Cost of dyeing/printing per meter fabric. Value loss, selling price decision of fabric. Costing in apparel industry: Raw material cost, labour cost and other expenses. Cost analysis of different garments with example.

Unit IV

Dollar Planning and control: Introduction, Responsibilities for a dollar plan, Requirements of a dollar plan, Approach to a dollar plan, Elements of the dollar plan (planned sales, Planned Stock – Stock turnover, Stock/Sales ratio. GMROI. The relationship between stock turnover and stock/sales ratio). Retail inventory method- Advantages, Applications.

Reading list

Title	Author
Advanced cost accounting	B.M.L. Nigam, G.L. Sharma
Fashion Buying & Merchandising	Sidney Packard
Fashion Design & Product Development	Harold Carr / John Pomeroy
Costing of apparel	Michael Jeffry

FA-405-F AUTOMATION IN GARMENT INDUSTRY

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

Automation in the apparel Industry. Automation in the retail industry. Computer integrated manufacturing in the textile industries. Automated material handling

Unit II

Robotics

Requirement for automation in today's textile manufacturing environment

Unit III

Quick response & Technology

Evolution of computer integrated manufacturing systems

Unit IV

Emerging technologies , Nature of trade & future of the apparel industry.

Reading list

Title	Author
Automation in the textile industry	G.A.Berkstresser, Buchanan, Grady
From fibres to apparel	

FA-407-F COMPUTER AIDED DESIGNING

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

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

Unit II

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

Unit III

Introduction to Computer Graphics – What is Computer Graphics, Computer graphics 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	Mikcle P Groover, Emory W.Zimmers Jr
Computer Graphics Principles & Practices Second Edition	James D Foley, Andeies Van Da Shvan K Feiner. John F Hughes
Computer Graphics	Donald Mearn & M Pauline, Baker
Mastering AUTOCAD 2004 & AUTOCAD LT 2004	George Omura

FA-409-F FASHION SELECTION

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

Children's Wear: Size categories for children's wear – infants, toddlers, young children and older girls. Selling seasons – Fall/Back to school, Holiday, Cruise/spring and Summer. Common fibres, fabrics, prints and trimmings. Sources of inspiration for children's wear. Designing of some garments.

Unit II

Women's Wear: Tops and Coats – different bodices, use of darts, ease gopres and yokes to design tops, different types of sleeves and placket finishes, knit styling. Designing of some women's wear garments

Unit III

Skirts – Basic skirt shapes and their variations, skirt lengths and waistband treatment.

Dresses – Different dress categories like junior dresses, contemporary dresses, Missy dresses.

Unit IV

Men's wear – Historical development of menswear, menswear manufacturing plant, menswear designer. Sources of inspiration, constructional details in menswear. Designing of menswear.

Reading List

Title	Author
Inside Fashion Design	Sharon Lee Tate
Inside Fashion Business	Kitty GDickerson

FA-411-F INDIAN BUSINESS ENVIRONMENT

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

Nature, Components and Determinants of Indian Business environment. General concept: GNP, GDP, BOT, BOP, Fiscal Policy, Monetary Policy, Fiscal Deficit, etc.

Unit II

New economic policy, EXIM Policy, Economic Reforms – Liberalization, Privatization, Globalization., Public enterprise reforms and Disinvestments programmes.

Unit III

Financial Institutions and their role. Concept of Stock exchanges and Role of SEBI.

World Bank and IMF and their impact on Indian Business Environment.

Unit IV

WTO – Genesis, Agreement, Rounds, Impact on Indian Business Environment, Indian Business Scenario.

National textile policy and Role of BIFR.

Reading List

Title	Author
Indian Economy	TR Jain
Economic Environment of Indian Business	Mishra & Puri
Business Environment	Francis Cherunilam
International Marketing	Cateora
International Marketing	Onkvisit & Shaw

FA-413-F PRINTING LAB

L T P
- - 3

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

Understanding of screen and block and stencil printing.

Printing of cotton, wool, silk, linen with direct resist and discharge printing. Pigment printing. Direct, discharge, resist and sublimation transfer printing of polyester fabrics. Printing of garments. Batik printing, different designs of tie-dye printing. Burn out printing, glittering printing, etc.

FA-415-F APPAREL DESIGN BY CAD

L T P
- - 3

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.

FA-417-F GARMENT INDUSTRY PRACTICE

L T P
- - 6-WEEKS SUMMER TRAINING

Class work : -
Examination : 300
Total : 300
Exam duration: 4 hrs

Each student individual or in association with some other student at the end of Third B.Tech course will observe and collect the general and technical informations pertaining to machinery, raw material used, yarns, fabrics and garments produced by the textile mill/ garment manufacturing unit/Apparel Export house, in which he/she is undertaking 6 weeks' practical training with the approval of Director, TITS.

FA-418-F SEMINAR

L	T	P
-	-	2

Class work	:	-
Examination	:	-
Total	:	-
Exam duration:		-

Each student will have to deliver a talk on the topics, in the weekly period allotted to the subject pertaining to his project work or any topic assigned by Head of the Department.

The performance of the speaker would be judged in the class by Board of Examiners. Awards will be given in the Eighth Semester

FA-419-F PROJECT WORK (Mid Term Evaluation)

L	T	P
-	-	2

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

An independent investigation of a problem in Textile/Apparel/ chemical processing under the supervision of a faculty advisor. A clear and systematic written presentation of the preliminary investigations like Project synopsis, Literature review, Project methodology, Material to be procured and Test methods will be adopted, References will have to be submitted atleast 15 days before the commencement of the Seventh Semester Examinations.

MAHARSHI DAYANAND UNIVERSITY, ROHTAK
SCHEME OF STUDIES AND EXAMINATION
B.TECH (FASHION & APPAREL ENGG) SEMESTER-VIII
'F' Scheme
EFFECTIVE FROM THE SESSION 2012-13

Course No.	Course Title	Teaching Schedule				Marks of Class work	Examination		Total Marks	Duration of Exam
		L	T	P	Total		Theor	Practical		
FA-402-F	High Tech Garments	3	1	-	4	50	100	-	150	3
FA-404-F	Quality Assurance in Apparel Industry	3	1	-	4	50	100	-	150	3
FA-406-F	Fashion Accessories	3	1	-	4	50	100	-	150	3
FA-408-F	Retailing and Fashion Promotion	3	1	-	4	50	100	-	150	3
FA-410-F	Chemical & Mechanical Finishing of Textiles	3	1	-	4	50	100	-	150	3
FA-412-F	Advance Apparel Construction Techniques <u>OR</u> Home Fashions	3	1	-	4	50	100	-	150	3
FA-414-F	Apparel Draping & Grading	-	-	3	3	50	-	50	100	4
FA-416-F	Advance Apparel Construction Lab <u>OR</u> Home Fashions Lab	-	-	3	3	50	-	50	100	4
FA-418-F	Seminar	-	-	2	2	200	-	-	200	4
FA-420-F	Project Work	-	-	2	2	100	-	100	200	4
Total		18	6	10	34	700	600	200	1500	

FA-402-F HIGH TECH GARMENTS

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

High Tech Garments – Definition and different types. Brief idea about properties and uses of specialty fibers like Nomex, Kevlar, Glass fiber, components as conductive yarns, shape memory materials, phase change material used in high tech garments.

Unit II

Protective clothing: General requirement of protective clothing. Chemical protective clothing (CPC) – Areas of use, CPC items for air-born, liquid hazard. Different chemicals used, parts of CPC, Performance evaluation – Permeation, Solubility and diffusion theory, Barrier effectiveness, structural integrity.

Thermal Protective Clothing - Combustion mechanism, fire governing parameters, Requirements, designing of TPC, Construction, various parameters affecting flame retardency, Performance evaluation.

Pesticide Protective Clothing – Requirements of protective clothing, different areas, different parts of PPC, Performance evaluation of PPC.

Antimicrobial clothing – Requirement, microbiology of skin clothing interface, approach to produce antimicrobial fabrics, performance evaluation.

Ballistic Protective clothing – Requirements, principle of mechanism, different fibers and fabrics, soft and hard armor, Factors influencing performance.

Unit III

Medical Responsive Garments – Definition, requirements, fibres, classification, working of artificial tandem and alignments, kidney, heart, surgical product, cardiovascular graft, sterilization, wound care.

Smart Electronic Clothing – Requirement, different sensor, processing of conductive yarn, implementation level of SOT, superhuman wardrobe, application in defense.

Sportswear – Requirement, different fibers used, approaches for manufacture.

Unit IV

Breathable apparel – Introduction, principle, classification and use. Moisture management fabric, polar technology, power dryetc.

High visibility apparels – Introduction, requirements, material, different classifications, design features.

Smart Colourants – Definition different types and application.. Different parts of space suit.Different parts of space suits.

Different textiles used as packaging material-types and properties

Reading List

Title	Author
The Super modern Wardrobe	Bolten, Andrew
Smart Fibres, Fabrics & Clothing	Tao, Xiaoming
Protective Clothing System & Material	Raheel, Masturaed

FA-404-F QUALITY ASSURANCE IN APPAREL INDUSTRY

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.

mark (20 marks).

Each question carries equal
Students have to attempt 5

questions in total at least one question from each unit

Unit I

Definition & importance of Quality, Tools of quality control,

Unit II

Quality Control – Principles of Quality Control, total quality control, statistical quality control, quality circle, quality and profitability, Quality control in fusing.

Unit III

Inspection – Definition, inspection, loop, raw material inspection, in-process inspection, final inspection, comparability checks.

Unit IV

ISO-9000 series of standards. Quality assurance, TQM, Six Sigma. Care labeling of apparel and textiles – American care labeling system, British care labeling system, Japanese care labeling system.

Reading List

Title

Author

An Introduction to Quality Control for the apparel industry

Pradip V Mehta

Managing Quality in the Apparel Industry

Satish Bhardwaj & V Mehta

The Technology of Clothing Manufacture

Harold Care & Barbara Latham

FA-406-F FASHION ACCESSORIES

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

Fashion Accessories – definition and classification. Usage of different raw materials as leather, fur, beads, metal etc. Various notions and trims used in fashion accessories.

Unit II

Leather Accessories: Brief idea about processing of leather, fashion leather terminology, care of leather. Leather Garments: Pattern making, needle and sewing thread specifications and finishing of garments.

Leather Footwear: Parts of shoe, brief shoe designing – as last, development last, pattern making, die-manufacturing, cutting, fitting, assemblage of remaining components, bottoming, finishing, caring of footwear. Handbags and belts: Construction and style of each.

Unit III

Jewellery Designing: Different metals and stones, faceted cuts used for jewellery designing. Brief production tech as fusing, soldering, cutting etc, stone settings, Different jewellery styles as rings, bracelets, necklaces, tiara etc. Different stone setting as buttercup, inlay etc.

Unit IV

Other accessories: Glove: Material used, component part of glove, glove construction, care of glove. Hosiery: Materials, Construction, Sizes and Care. Hats: Construction, care of hats. Scarves: Construction, Care and styles.

Reading list

Title	Author
Know your Fashion Accessories	Meadows
Fashion Apparel & Accessories	Diamond, Jay & Ellen

FA-408-F RETAILING AND FASHION PROMOTION

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 Retailing, types of Retailers and Ownerships. Elements of Retail Mix. Store Organizations. Retailing market strategy and benefits of Retail marketing.

Unit II

Analysis of area and site selection. Departmentalization, Layout planning and space allocation. Basic Profit Factors- the relationship of Markup to Profit. Retail Pricing & re-pricing. Inventory control.

Unit III

Planning and Direction of Fashion advertising and different kinds of Advertising, Scheduling and planning (Public Media, Newspaper, Magazine, radio, Television, Direct mailing, etc.)

Unit IV

Retailing and fashion promotion, Co-operative advertising, the advertising department in a retail store, Advertising agencies, Publicity, Special events, Visual presentation (Window, Interior). The buyer's role in promotion.

Reading list

Title	Author
1. Introduction to the World of Retailing	Levy and Weitz; Berman and Evans
2. Retail Institutions and Multi-channel	Levy and Weitz; Berman and Evans
3. Strategic Planning in Retailing	Berman and Evans
4. Retail Market Strategy	Levy and Weitz
5. Identifying and Understanding Consumers	Berman and Evans
6. Customer Buying Behavior	Levy and Weitz
7. Store Layout, Design and Visual Merchandising	Levy and Weitz
8. Retail Image and Promotional Strategy	Berman and Evans
9. Pricing	Levy and Weitz; Berman and Evans

FA-410-F CHEMICAL & MECHANICAL FINISHING OF TEXTILES

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 textile finishing. Aim and scope. Classification of finishes. Various mechanical finishes in industrial practices, like drying, conditioning, calendaring, sanfonrising, heat setting, Crabbing, decatizing, milling, peaching, raising and shrink finishing of wool etc.

Unit II

Various chemical finishes like softening, stiffening, delustering of rayon, polyester, organdy finish. Silky finish of polyester. Weighting of silk.

Unit III

Introduction to specialty finishes – finishing of denim fabrics, anti-crease finish, water repellent finish, flame-proof and flame-retardant finish, soil and oil repellent finish, anti-static finish, rot and mildew proofing, antimicrobial, stone wash some other specialty finishes.

Unit IV

Machinery involved in these finishes. Methods of evaluation of various finishes on textile materials.

Reading List

Title	Author
An Introduction to Textile Finishing	JT Marsh
Textile Auxiliaries & Finishing Chemicals	AA Vaidya, SS Trivedi
Textile Finishing	VA Shenai

FA-412-F ADVANCE APPAREL CONSTRUCTION TECHNIQUES

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

Production Scheduling, Patterning and cutting procedures, Garment assembly,

Unit II

Pattern making and construction techniques of shirts, pants/trousers and Jackets/Coats, Swimwear, sportswear/Actionwear, Capes or hoods.

Unit III

Development of Men's Ready-to-wear, Design and production procedures of Men's tailored clothing.

Unit IV

Presentation techniques – Flat sketches, Mood board, Storyboard, Portfolio.

Reading List

Title	Author
Inside the Fashion Business	K G Dickerson
Fashion from Concept to Consumer	G S Frings
Pattern-making for Fashion Design	H J Armstrong
Introduction to Fashion Design	

OR

FA-412-F HOME FASHIONS

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 Home Fashion, Present scenario of Home Fashion/Textile market in the domestic and international market.

Unit II

Selection of raw material and the essential characteristics of Home Textile materials.
Different home fashion fabrics – Table Linens, Bedspreads, Curtains, other draperies.

Unit III

Advanced fabric structures for Home Textile materials – Brocade, Damask, Gauze, Leno, Upholstery fabrics.
Floor Coverings – Carpets (domestic and machine made and rugs).

Unit IV

Design criteria of Home Fashion/Textile material
Presentation techniques – Flat sketches, Mood board, Storyboard, Portfolio.

Reading List

Title	Author
Watson's Advanced Textile Design	Z J Grosicki
Textile Fabrics and their Selection, 7 th Ed	Isabel B. Wongate
Fashion & Furnishing International	
Inside the Fashion Business	K G Dickerson
Fashion from Concept to Consumer	G S Frings
Pattern-making for Fashion Design	H J Armstrong
Sewing	Readers Digest

FA-414-F APPAREL DRAPING & GRADING LAB

L T P
- - 3

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

Illustration for the techniques of draping to get the fault free draped pattern. Practice of draping of basic bodice to the dress-form. Variations in bodices as per the designing details. Draping of basic skirt and hence skirt variations.

Fundamentals & techniques for Grading with the use of size-charts etc. Grading of basic bodices by z-track and 3-track method. Computerized grading on Lectra software. Practice on software available for draping and grading.

FA-416-F ADVANCE APPAREL CONSTRUCTION LAB

L T P
- - 3

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

Practice of pattern making and construction of shirts, pants/trousers and Jackets/Coats. Development of Design of Men's tailored clothing. Making of Flat sketches, Moodboard, Storyboard and Portfolio.

Computerized Apparel Design: Introduction to "Basics of Computer Aided Design for Apparel Design". Usage of different drawing and measuring tools. Basic Block construction and digitization of patterns. Pattern making of different garments, e.g. skirts, jackets through assembly of lines, points, derived pieces, fold etc.

Introduction to Grading techniques. Application of grading system to basic blocks and adaptations.

Introduction to Marker planning and marker making for different garments for maximum fabric utilization. Introduction to the plotting methods and techniques.

OR

FA-416-F HOME FASHIONS LAB

L	T	P	Class work	:	50
-	-	3	Examination	:	50
			Total	:	100
			Exam duration:	:	4 hrs

Introduction to the “Textile Designing & Development Software”. Practice of making Color & Weave Effects.

Developing designs for home furnishing fabrics like, Bed-sheets, curtains, table linens, etc.

Utilisation of the computerized designs for the manufacturing of the sample of home-furnishing textiles.

Making of flat sketches, Moodboard, storyboard and portfolio.

FA-418-F SEMINAR

L	T	P	Class work	:	-
-	-	2	Examination	:	200
			Total	:	200
			Exam duration:	:	4hrs

Each student will have to deliver a talk on the topics, in the weekly period allotted to the subject pertaining to his project work or any topic assigned by Head of the Department.

The performance of the speaker would be judged in the class by Board of Examiners.

FA-420-F PROJECT WORK

L	T	P	Class work	:	-
-	-	2	Examination	:	100
			Total	:	100
			Exam duration:	:	4 hrs

An independent investigation of a problem in Textile/Apparel/ chemical processing under the supervision of a faculty advisor. A clear and systematic written presentation of the results in the form of project report will have to be submitted atleast 15 days before the commencement of the Eighth Semester Examinations.