BHARATHIAR UNIVERSITY, COIMBATORE 641 046.

PG DIPLOMA IN APPAREL MERCHANDISING & MANAGEMENT

SCHEME OF EXAMINATIONS

Semester I

Title of the Paper	Instruction Hours / Week	Exam	
		Dur.Hrs	Total
Textile Fibre & Yarn	4	3	75
Fabric Production and Processing	4	3	75
Garment Manufacturing	4	3	75
Personnel Management & Industrial Relations	4	3	75
Fabric Production and Testing- Practical	9	4	100
Total			400

Semester II

Title of the Paper	Instruction Hours / Week	Exam	
		Dur.Hrs	Total
Garment Quality Assurance	3	3	75
Apparel Merchandising	4	3	75
Costing, Documentation & Shipping Procedures	3	3	75
Internship & Case Study-Viva Voce	6	3	75
Garment Making -Lab	9	4	100
Total			400

Textile Fibre & Yarn

UNIT I

Textile fibres: Classification – General properties – Identification of textile fibres – Influence of fibre properties on yarn quality - Polymer - Polymerization types - Types of polymer – Requirements for fibre forming polymers – Filament spinning.

UNIT II

Cotton: Botanical and commercial classification - Brief study on Indian hybrid and imported commercial cotton varieties – Fibre morphology – Polymer system – Chemical composition - Properties - End uses.

Flax: - Fibre morphology – Polymer system – Chemical composition - properties - End uses - Properties common to all Cellulosic fibres.

Wool: Producing countries - Grading - Fibre morphology – polymer system – chemical Composition - properties - End uses - Felting - Woolen and Worsted Yarns - End uses - Brief study on Specialty hair fibers and uses.

Silk: Fibre morphology – polymer system – chemical composition - properties - End uses. Types and major growing places - Production of Raw silk - Degumming - Weighting - Properties -

UNIT III

Semi synthetic fibres: Rayon - Regenerated and modified cellulose -Viscose rayon process flow - HWM fibres - Comparison of properties between viscose and HWM rayons –End uses – Acetate fibre - Process flow - Properties - End uses

UNIT IV

Synthetic fibres: Common steps for the production – Brief study about polyamide, polyester, polyacrylic, and spandex - Individual fibre properties and trade names – End uses. Brief study on aramid, carbon, metallic. and micro fibres with uses.

Methods of filament spinning - Drawing and effects –- Textured filament, Types of textured yarns - Methods of texturisation. End uses of textured yarns.

UNIT V

Yarn: Classification of yarn types- Staple spinning system - Types – Cotton Yarn Production sequence and objectives - Comparison of carded and combed yarn - Winding and it's objects –

Waxing and it's significance - Yarn numbering systems - Significance of yarn twist

Blended textiles: Types of blending - Reasons for blending - Double yarn - Properties -

Sewing threads: Types, features, uses - Properties required for export quality hosiery yarns, Various Yarn & Package defects.

References:

1. Shenai. V.A. *Textile fibers technology of textile processing*, Vol –1.
2. Wynne, A, *The motivate.*
3. Mishra, S.P. *A text book of fibre science and technology.*
4. Gordon Cook, J, *Hand book of textile fibres* –1 & II.
5. Carr, C.M, *Chemistry of the textiles industry.*
6. Phyllis G.Torton, *Understanding textiles.*

7. Marjory L.Joseph, *Essentials of textiles.*
8. Joseph J.Pizzuto, *Fabric science.*
9 Goswami.J.C., Martindale.J.G, Scardino.K.L., *Textile yarns, Technology, Structure & Applications*
10. Moncrieff,W, *Man-made fibres.*
11. *Identification of textile materials, The textile institute, Manchester.*
12. Eric Oxtoby, *Spun yarn technology*
13. Sadov.F, Korchagin.M, Matesky.A, *Chemical technology of fibrous material.*

Fabric Production and Processing

UNIT I:
Basic Knitting Technology: Principles and comparison of weaving and Knitting, Introduction to weft and warp knitting – Classification of weft knitting machines - Terms and definitions of weft knitting
- Study of basic weft knit structures and their characteristics - Knitting cycle of single jersey, rib and interlock structures

UNIT II:
Modern Knitting Machines: Salient features of modern knitting machines - Ornamentation of basic weft knit structures - Different types of cams & needles - Formation of derived stitches - Characteristics of tuck & miss - Adjustments & setting of GSM - Modern double jersey machines and structures - Identification of various single and double jersey structures.

UNIT III:
Jacquard and Speciality Knitting: Needle selection techniques - Auto stripes - Terry and Fleece – Insertion of elastomeric yarn in knitting - Identification of various jacquard & speciality structures.

Knitting Calculations: Count-gauge relationship - Production & GSM calculations – Influence of stitch length and tightness factor on fabric characteristics. Fabric faults, causes and remedies.

UNIT IV:
Introduction to wet processing – Brief study of preparatory processes of dyeing and objectives – Meaning of dyes and pigments – Various classification methods of dyes – Principle & method of dyeing of cotton knitted fabric – Principle and working of jigger, beam dyeing, winch, soft flow and air flow machines – Concept of tie and dye – Brief study on garment dyeing.

UNIT V
Introduction to printing –Comparison of dyeing and printing – Methods of printing – Study of table screen printing and rotary screen printing methods. Styles of printing – Study of non conventional printing styles employed in garment printing – Principle and working of garment printing machine – Printing ingredients and model recipe formulation. Need and objects of finishing – Classification – Brief study of various mechanical and chemical finishes.

References:

1. *D.B.Ajgoankar*, Knitting Technology, Universal Publishing Corporation, Mumbai (1998).
2. *David.J Spencer*, Knitting Technology, Wood Head Publishing Ltd. – Second Edition,England (1989).
3. *Samuel Raz*, Flat Knitting, Meisenbach Bamberg (1993).
4. *J.E.Booth*, Textile Mathematics, The Textile Institute Manchester – I Edition(1997).
5. *Peter Schwartz, Trevor Rhodes and Mansour Mohamed*, Fabric Forming Systems,Mahajan Publishers, Ahmedabad (1996).
6. *Chandrasekara Iyer, Bernd Mammel and Wolfgang Schach*, Circular Knitting,Meisenbach Bamberg (1992).
7. *Wynne, A,* The Motivate Series – Textiles, Macmillan EducationLtd., London (1997).
8. 8. *Bernard P. Corbman*, Textiles, Fibre to Fabric
9. *Shenai.V.A.,* Technology Of Bleaching & Mercerising, Sevak Publications, Wadala,Mumbai-31.
10. 10. *E.R.Trotman*, Textile Scouring & Bleaching, B.I. Publications Pvt. Ltd., New Delhi (1968).
11. 11. *Warren.S.Perkins,* Textile Coloration and Finishing, Carolina Academic Press, Durham, North Carolina (1996).

Garment Manufacturing

Unit - I

Introduction to Garment Industry – Detailed Study of Process Sequence- Garment Analysis and Classification –Measurements and Size Charts for Men, Women, Children-Requirement and Breakdown of Garment Flow Process –Torso and Bifurcated Garments.
Fabric Selection Techniques for Garments - Case Study on Garment Classification, Flow Process and Fabric Selection.

Unit – II

Introduction to pattern making – Concepts of pattern making – Pattern production terms – Pattern Making Tools – Standard body measurement details – Style variation in Garment components - Neck Lines. Concept of Pattern layout – Rules in Pattern layout – Common method of Layout – Concept of Grading – Methods of Grading – Manual Pattern Grading. –

Introduction to Computer Aided Pattern Making and Grading – Case Study on Standard Body Measurements of Different Countries for Men, Women and Children Clothing – Defects in Pattern, Causes and Remedies.

Unit – III

Lay and Marker Planning – Study of Methods of Marker Planning – Study of Spreading Methods Concepts of Marker Planning – Marker Planning, Drawing and Reproduction of Marker – Marker Efficiency – Spreading and Methods – Various Cutting Methods and Limitations – Bundling – Defects in Cutting, Causes and Remedies

Unit – IV

Classification of Industrial Sewing Machines – Applications – Description and Working of Single Needle Lock Stitch Machine, Double Needle Lock Stitch Machine, Over Lock Machines, Flat Lock Machine – Brief Study on Specialty Sewing Machines.

Types and Parts of Sewing Machine Needles – Needle Sizes.
Sewing Machine Feed Mechanisms: Drop Feed – Differential Feed – Variable Top Feed Combined with Drop Feed - Variable Top Feed Combined with Differential Feed – Compound Feed – UnisonFeed.
Machine Bed Types: Flat Bed - Cylinder Bed - Post Bed – Feed – Off – The – Arm – Applications.
Brief Study on Work Aids, Special Purpose Machines and Needles –Defects in Sewing, Causes and Remedies.

Unit - V

Study on Various Garment Finishing Machines for Fusing, Sucking, Ironing and Packing.
Role of Accessories - Buttons, Zipper, Labels, Lining. Interlining Labels Wadding, Lace, Braid & Elastic - Quality Parameters in Accessories.

References:

1. Technology of clothing manufacture - Carr & latham
2. Apparel manufacturer's handbook - Jacob solinger
3. Guide to sewing machine and Catalogues of accessories.

Personnel Management & Industrial Relations

UNIT I:
Introduction: Definition – Functions – Objectives – Role of personnel management in industry. Principles of good personnel policy. Organizing the personnel function. Leadership – Motivation– Job satisfaction and Morale – communication – Control process.

UNIT II:
Human resource management: Objectives and planning of manpower - Job analysis, job description, and job specification. Recruitment and selection. Training and development. Performance appraisal.
Career planning and job change.

UNIT III
Job evaluation, Employee compensation – Wages and salary – Incentives, DA, Bonus and wage differentials. Wage acts and policies.

UNIT IV

Labour welfare – Safety Engineering – Accidents – Good housekeeping – Welfare acts: Welfare funds – Voluntary Benefits – Insurance – Provident Fund – Gratuity – Maternity benefits - ILO.

UNIT V

Industrial Relations: Meaning – approaches – Significance. Trade Unions – Collective bargaining. Grievance and employee discipline. Workers Participation in management. Union – management Relations.

Industrial Disputes: Forms of disputes – Methods of prevention and settlements of Industrial disputes – Authorities for settlement.

References:

1. Personnel Management & Industrial Relations, P.C. Tripathi.
2. Industrial Engineering and management. O.P. Khanna
3. Venkataraman C.S & Srivastava B.K, *Personnel Management and Human Resources*, Tata
   McGraw Hill, 1991.
4. Arun Monappa, *Industrial Relations*, Tata McGraw Hill, 1987.
5. Dale Yodder &. Paul D Standohar, *Personnel Management and Industrial Relations*, Sterling Publishers, 1990.
6. Mamoria, C.B, *Personnel Management*.
7. Dessler, *Personnel Management*.
8. Rudra Basavaraj, M.N., *Dynamics of Personnel Administration.*

Fabric Production and Testing- Practical

A. Testing and Quality

1. Determination of Count of Yarn Using Wrap Reel & Electronic Balance.
2. Fabric Analysis for Determining GSM, CPI, WPI, SL, CL & Yarn Count of Given Sample
3. Determination of Colour Fastness of Given Sample to Washing by Using Launderometer and Rating with Help of Grey Scales.
4. Determination of Color Fastness of Given Sample to Rubbing by Using Crockmeter and Rating with Help of Grey Scales.
5. Determination of Bursting Strength of Given Sample by Using Bursting Strength tester.
6. Determination of Dimensional Stability% (Shrinkage / Growth) of a Given Fabric/Garment to Washing by Using Washing Machine as Per ISO Procedures.

B. Knitting

Identify and Analyse the Given Swatch for the Following Particulars:

A)Courses and Wales Per Cm B) Loop Length C) Technical Graph D) Cam Order E) Needle Order

Samples:

1. Pique 2. Thick Pique 3. Lacoste (Honey Comb)
4. Pearl 5. Cross Miss 6.Twill 7. 2/3 Thread Fleece 8. Jacquard Design

(Any one of the above designs shall be given)

C. Dyeing

1. Scouring of grey cotton knitted fabrics and estimate the scouring loss percentage.
2. Bleaching the given cotton knitted fabrics using hydrogen peroxide.
3. Dye the given cotton sample with cold brand reactive dyes.
4. Dye the given cotton sample with hot brand reactive dyes.
5. Dye the given cotton sample with reactive H-E dyes.
6. Dye the given polyester sample using carriers.
7. Develop a batik motif and print on the given sample.
8. Prepare the print paste with pigment colour and print on the given fabric.

Garment Quality Assurance

Unit I

Quality - Definitions - Quality and grade a Comparison - Quality terminologies – Factors influencing quality - Benefits of quality - Sources of International Standards -Benefits.

Unit II

Testing of Yarn: Principle of yarn count Determination – standard procedure.
Study about Uster evenness tester –Study about classimate faults and its effect.
Influence of yarn hairiness on fabric quality.
Testing of Fabric: Knitted Fabric Specifications - CPI, WPI, LL, CL, TF & GSM – Calculations.
Fabric Bursting Strength Testing – testing of Abrasion and Pilling Resistance - Air Permeability Testing - Crease Recovery testing - Fabric Handle – testing of fabric drape. Testing of Dimensional Stability of Knitted Fabric and its Importance

Unit III

Color Fastness: Introduction to Color Fastness - Importance - Agencies of Color Fastness: Washing, Rubbing, Perspiration, Light - Grey Scales and Ratings - Standard Testing Procedures - Reasons For Poor Color Fastness. Brief study about computer colour matching.
Testing of Garments: Tests related to garment appearance and performance such as measurement of seam pucker, seams slippage and seam strength. Testing of Garment Accessories: Testing of Zippers, Buttons, and Sewing Threads.

Unit IV

Inspection of Incoming Materials
Introduction - Types of inspection - Raw material inspection - Benefits -Fabric inspection - 4 point system - 10 point system - Graniteville "78" system - Need for the inspection of sewing threads and apparel accessories - Testing of sewing threads, zippers, fusible interlinings, buttons and fasteners

Unit V

In-Process Inspection: In process inspection - Advantages - on line inspection during spreading, pattern making, cutting, sewing, fusing, printing, embroidery. Pressing / finishing
Final Inspection : Introduction to Sampling, Sampling Plans and AQL Charts - Final Inspection - Level of Final Inspection - MIL 105 Standards - Packing & Packaging Quality Tests - Case study on final inspection.

References

1. Principles Of Textile Testing – J.E. Booth
2. Hand Book Of Textile Testing & Quality Control – Elliot B. Grover & D.S. Hamby
3. Textile Testing – P. Angappan & R. Gopalakrishnan
4. Managing Quality In Apparel Industries – Pradeep V Metha & Satis K. Bhardwaj.

Apparel Merchandising

UNIT I

Merchandising: Introduction, Meaning- Apparel Merchandising – Concepts of 'Six Rights' – Organisation structure of an apparel industry – Classification of Exporters - Rating or Grading of export houses – Classification of buyers – Export merchandising and retail merchandising – Company profile and its contents

UNIT II

Process flow in apparel industry – Buyer sourcing & communication – Enquiry – Order confirmation – order review and its importance – Planning & programming: Master planning, Scheduling or route card – Factors for route card - programming for yarn, knitting, dyeing, stitching, sampling, accessories – Samples: Meaning & importance – Types of samples – expedition of samples

UNIT III

Inspection and its types –Approvals - Types of approvals – Shipping marks – Effective expedition procedures – Order sheet and its contents – Packing list and its contents – Document formats: order sheet, packing list, invoice, inspection and testing reports etc., - Assortment and its types

UNIT IV

Types of merchandiser - Functions of a merchandiser – Essential requisites of a good merchandiser – Vendor sourcing, evaluation and development – Global sourcing – Vendor nomination by buyers – Reasons for vendor nomination – Documents recording and maintenance – Claims and reasons for claims - Factory audits – Buyer's code of conducts

UNIT V

Export associations – Apparel Export Promotion Council – Journals and magazines related to apparel and textiles –Trade shows and Fairs – Participation in trade shows – Advantages of trade shows and fairs - Apparel & Textile Trade shows and fairs in India .

REFERENCES:

1. Daragho' Reilly, Jullian J. Gibbs, Building Buyer Relationships.
2 Mc Millan Publishing Co., Inside the Fashion Business..
3. Strong Elian, Fashion Merchandising.
4. Apparel merchanidising
5. Apparel Views, Jan'09, " Apparel Merchandising – The concept of six rights"

Costing, Documentation & Shipping Procedures

UNIT I

Cost - Types of Cost: Fixed Cost, Variable Cost, Semi Variable Cost, Conversion Cost, Differential Cost - Elements of Cost - Direct Material Cost - Direct Expenses - Direct Wages - Indirect Materials -indirect Expenses - Indirect Labour - Overheads - Production Overhead - Administrative Overhead Selling Overhead Distribution Overhead - Components of Cost Sheet.

Cost Estimation of Yarn, Knitted Fabric, Dyeing, Printing & Finishing, Cutting, Stitching, Checking, Packing, Forwarding, Shipping, and Insurance Etc for a given order.

UNIT II

Estimation of Requirement Various Raw materials like yarn,buttons, Sewing thread, Twill tape etc.,

Case Study on Estimation of Factory Cost for Vest, Briefs, Shorts, T-Shirts, Pyjamas, Children's Wear,Ladies Wear Etc.

Various Factors to be considered in Costing for Domestic Products & International Products

UNIT III

Introduction to International Trade - Global Scene, - Prospects for Indian Apparel in Overseas Market, Globalisation, GATT and WTO. RCMC and Export Promotion councils – Procedure to start an export firm - Sales contract and its check list.

UNIT IV

Export Procedure -Pre-Shipment and Post Shipment Credit - Exchange Rate Arithmetic INCO Terms - Payment Terms - Logistic Management. Need for Documents – Invoice - Certificate of Origin - L/C, Shipping Bill - Bills of Exchange- Bill of Lading - GR Form - Packing List - Duty Draw Back – Export License - Marine Insurance Policy.

UNIT V

Export Procedure and Recent Policies of the Government

Customs - Meaning, Definition, Types, Exercise and Customs, Clearance of Export Cargo – Shipment of Goods and Port Procedures - Claiming Duty Draw Backs and Other Benefits.

References:

1. Jeremy Rosenau, Apparel Merchandising.
2. Anitha A. Stamper, Evaluation of Apparel Quality.
3. Anitha A. Stamper, Experimental Apparel Construction.
4. B.M. Lal Nigam, Cost Accounting Principles and Practice

Internship & Case Study-Viva Voce

Students will be asked to go for 15 days internship training during winter vacation and week ends of the second semester.

Students will be given a case study during the internship and they have to submit a report thereon at the end of the semester, on dates announced by the institute/department. The guidelines for training will be provided by the institute/department.

A Team consisting of Internal & External Experts will evaluate the Record and conduct the Viva-Voce at the end of the Final semester.

Garment Making -Lab

A. Pattern Making

List of Experiments

1. Basic Round Neck T- Shirt
2. Basic Polo.
3. Men's Hooded – T – Shirt.
4. Men's Raglon Shirt.
5. Men's Inner Garment – Brief.
6. Kids Wear – "A " Line Frock..
7. Baba Suit.
8. Romper.

B. Machine Parts and Threading:

1. Draw the Threading Diagram of SNLS Machine and the Various Parts of Machine**.**
2. Draw the Threading Diagram of over lock Machine and the Various Parts of Machine**.**
3. Draw the Threading Diagram of Flat lock Machine and the Various Parts of Machine**.**

C. Pedaling Exercise on Paper and Fabrics:

1. Straight and Curves
2. Squares, Rectangles
3. Triangles and Unlimited Shapes

D. Making of Various Seams and Components:

1. Various Seams Types - Superimpose, Bound, Lap, Piping Etc..
2. Samples of Components Such as
   A. Round Neck B. Scallop Neck
   C. Gents Placket D. Ladies Placket
   E. Cross Pocket F. Band Collar