BHARATHIAR UNIVERSITY:: COIMBATORE – 641 046

PG DIPLOMA IN APPAREL MANUFACTURING & MERCHANDISING (PGDAMM)

SCHEME OF EXAMINATIONS

(For the Candidates admitted from the Academic year 2017-18 and onwards)

Code	COURSE TITLE	Instruction Hours per Week	Exam Duration Hours	Maximum Marks		
				CIA	Marks	Total Marks
Semester I						
Paper 1	Textile Fibres & Yarns	4	3	20	55	75
Paper 2	Fabric Science	4	3	20	55	75
Paper 3	Textile Coloration & Finishing	4	3	20	55	75
Paper 4	Clothing Construction	4	3	20	55	75
Practical 1	Knit Fabric Analysis	3	3	20	30	50
Practical 2	Textile Coloration	3	3	20	30	50
Practical 3	Stitches & Seams	3	3	20	30	50
-	Internship - I	5	3	20	30	50
		30	-	-	-	500
Semester II						
Paper 5	Apparel Quality Assurance	4	3	20	55	75
Paper 6	Apparel Costing & Documentation	4	3	20	55	75
Paper 7	Apparel Merchandising	4	3	20	55	75
Practical 4	Textile Testing	3	3	20	30	50
Practical 5	Pattern Making & Clothing Construction	4	3	20	30	50
Practical 6	Computer Aided Pattern Making	2	3	20	30	50
Paper 8	Personal Management & Industrial Relations	4	3	20	55	75
-	Internship - II	5	3	20	30	50
	Total	30	-	-	-	500

TEXTILE FIBRES AND YARN

UNIT I

Introduction to Textile fibers & their Classification – General properties. Cotton: Botanical and commercial classification - Properties - End uses. Brief study about Organic Cotton. Flax: properties - End uses. Wool: Grading - properties - End uses. Woollen and Worsted Yarns. Silk: Types - properties - End uses. Production of Raw silk - Degumming.

UNIT II

Methods of Filament Spinning. Semi synthetic fibres: Rayon - Regenerated and modified cellulose -Viscose rayon process flow – Modal & Lyocell Fibre properties & End uses. Bamboo fibre –End uses. Acetate fibre - Properties & End uses

UNIT III

Introduction to Polymer & Polymerization & its types. Synthetic fibres: Brief study about polyamide, polyester, polyacrylic, and spandex - fibre properties and End uses. Micro fibres& its properties. Texturization : Objectives, Types of textured yarns & Methods of texturisation.

UNIT IV

Yarn: Classification of yarn types- Staple spinning system – Types. Influence of fibre properties on yarn quality. Cotton Yarn Production sequence and objectives - Comparison of carded and combed yarn - Winding and it‟s objects –- Yarn numbering systems - Significance of yarn twist.

UNIT V

Brief study about OE & Compact Spinning. MilangeYarn . 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.

REFERENCE BOOKS

1. Wynne, A, *The motivate.*
2. Mishra, S.P. *A text book of fibre science and technology.*
3. Gordon Cook, J, *Hand book of textile fibres* –1 & II.
4. Carr, C.M, *Chemistry of the textiles industry.*
5. Goswami.J.C., Martindale.J.G, Scardino.K.L., *Textile yarns, Technology, Structure &Applications*
6. Moncrieff,W, *Man-made fibres.*
7. Eric Oxtoby, *Spun yarn technology*

FABRIC SCIENCE

Unit – I

Classification of fabric forming methods – Weaving preparatory processes and its objectives – Warping, Sizing & Drawing – in. Passage of material through a plain power loom – Primary, secondary & auxiliary motions of a loom.

Unit – II

Classification of Looms. Shuttle less looms: Introduction - Advantages - Types of shuttle less looms. Introduction to weaves – Plain weave & derivatives – Twill weaves & derivatives – Satin & sateen weaves.

Unit III

Comparison of weaving and knitting - Principles of weft and warp knitting – Terms and definitions of weft knitting. Knitting machine elements and description Classification of knitting machines - Yarn passage diagram of a circular knitting machine..

Unit IV

Knitting cycle of latch needle with sinker. Description of circular Rib & Interlock knitting machine – Characteristics of basic weft knit structures –Ornamentation of basic weft knit structures - Principal weft knit stitches. Knit, tuck and miss stitch formation and properties - Representation of weft knit stitches.

Unit V

Jacquard and Speciality Knitting: Needle selection techniques - Auto stripes - Terry and Fleece. Flat Knitting – Yarn passage diagram of a flat knitting machine – Mechanical type Flat knitting machine - Needle bed assembly – Racking, Carriage and Cam box arrangement. Introduction to warp knitting – Warp knitting terminologies

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. *Peter Schwartz, Trevor Rhodes and Mansour Mohamed*, Fabric Forming Systems,Mahajan Publishers, Ahmedabad (1996).
5. *Bernard P. Corbman*, Textiles, Fibre to Fabric

Textile Coloration & Finishing

Unit – I – Preparatory processes

Water: water hardness – types - softening process: ion exchange –Lime Soda Process. Preparatory process sequence for Woven & Knitted fabrics. Preparatory process: Singeing – objectives, principles and methods - yarn and fabric singeing machines. Desizing methods. Scouring– scouring of coloured fabrics.. Bleaching: hypochlorite and hydrogen peroxide bleaching – Fluorescent brightening agents. Mercerization

Unit – II Dyeing

Colour: Electromagnetic spectrum, classification of dyes. Dye bath Auxiliary chemicals. Dyeing of blended textiles. Features and working principles of processing machines: Cheese, jigger, jet and soft-over-flow machines. Padding mangles. Garment Dyeing Machines

Unit – III - Printing

Differences between dyeing & Printing. Various methods of printing. Screen preparation. Styles of printing – direct, resist, discharge. Print paste ingredients. After treatments for printed textiles. Garment printing techniques.

Unit – IV –Finishing

Introduction to finishing- objectives- Classification of finishing. Raising and Shearing: Compacting. Calendaring. Heat Setting. Types of garment washes: Stone Wash, Enzyme Wash, Bio-Polishing , Acid Wash. Sand Blasting.

Unit V –Machines & Effluent Treatment.

Application of enzymes in textile processing. Pollution - Treatment of Textile Effluents. Eco Labels & Norms. Introduction to computer colour matching system. Wool scouring and carbonizing – Silk Degumming.

References:

1. Dyeing and chemical technology of textile fibres, Charles Griffin & Co – E.R.Trotman
2. Technology of Bleaching and Dyeing of Textile Fibres Vol.1, Part–I,1979, Mahajan Book Publishers, - *Chakravarthy RR And Trivedi S.S*
3. The Bleaching and Dyeing of Cotton Material 1983, Weaver‟s Service Cent *Prayag R.S.,*
4. Chemical Processing of Synthetic Fibres and Blends 1982, John Wiley & Sons, New York. *Datye K.V and Vaidhay A.A.,*
5. Processing of Manmade Fibres 1975, MIR Publishers, Moscow.- *Usenko V,*
6. Colour for Textiles: A User‟s Handbook, Society of Dyers and Colourists(1993) - *Wilfred Ingamells,*
7. Cellulosics Dyeing, Society of Dyers and Colourists(1995) - *John Shore,*
8. Wool Dyeing, Society of Dyers and Colourists(1992) - *Lewis.D.M.,*
9. Textile Coloration and Finishing, Carolina AcademicPress, Durham, North Carolina (1996) - *Warren.S.Perkins,*

Clothing Construction

Unit I

Introduction to garment manufacturing processes. Spreading machine: Types and working procedures. Cutting machines: Types of cutting machines and its application – Detailed study on band knife, straight knife, round knife & Die cutting machines. Computerized cutting machines. Auxiliary cutting devices – Drills, notches.

Unit II

Classification of sewing machines & applications. Lockstitch machine - function & its types - Features of advanced lock stitch machines. Over lock machine - Function & its functions. Flat lock machines. Feeding mechanism, importance & Its types. Needle mechanism. Stitching mechanism. . Bar tacking machine. Picoting Machine.

Unit III

Concept of Stitch & its classification- Federal standard & British standards. Concept of stitch geometry. Detailed study on Stitch classes and its function – advantages and disadvantages.

Unit IV

Requirements – Guides – Types (edge & curve guide) - Compensating foot - Specialized presser foot – Stitching jig- hem folders - Slack feeding and elastication – Cutting aids (threads, elastic and tapes) - Stacker. Simple automatics - Button hole – Button sew – Label sewers. Types and parts of machine needles – Needle sizes - Details of stand, table and motor for sewing machines.

Unit V

Introduction to various machines for garment finishing – Fusing – Sucking – Ironing - Packing. Pressing- Purpose of pressing –Categories of pressing-The means of pressing-pressing equipment and methods-Iron and steam presses. Packaging-Types of package forms-Types of packaging materials-Quality specification of packaging materials-Merchandising packaging-Shipment packaging-Selection of package design.

References

1. *Harold Carr and Barbara Latham,* The Technology of Clothing Manufacture, Blackwell Science Ltd, England (1994).
2. *Gerry Cooklin,* Introduction to Clothing Manufacture, Blackwell Science Ltd, England (1991).
3. *Dora.S.Lewis, Mabel Goode Bowers and Marietta Kettunen,* Clothing Construction and Wardrobe Planning, The Macmillan Company : New York (1955).
4. *Terry Brackenbury,* Knitted Clothing Technology, Blackwell Science Ltd, England.
5. *Ruth. E, Glock and Grace.I.Kunz,* Apparel Manufacturing, Pearson Education, New Delhi.

Fabric Analysis Practical

1) Development of the following samples:
1. Single jersey & its derivatives
2. Double jersey & its derivatives
3. Auto striper
4. jacquard designs

2). Analyze the given knitted fabric sample for the following particulars:
A) Course and Wale Density
B) Loop length
C) Areal Density (GSM)
D) Tightness Factor
E) Technical graph
F) Cam order
G) Needle order

3). Analyze the given woven fabric sample (Plain , Twill , Satin and its derivatives) for the following particulars and draw the design, draft and peg plan
A) EPI
B) PPI
C) Warp and Weft crimp & count
D) Cover Factor
E) GSM

Textile Coloration Practical

1. Estimation of water hardness by EDTA method.
2. Combined Scouring & Bleaching of grey cotton woven / knitted fabrics and estimate the loss percentage.
3. Dye the given cotton sample with natural dyes.
4. Dye the given cotton sample with cold brand / hot brand / HE reactive dyes.
5. Dye the given silk material with acid / basic dyes.
6. Dye the given wool material with acid / basic dyes.
7. Dye the given polyester sample with disperse dyes using carriers.
8. Dye the given fabric for the given pattern using Tie & Dye Technique.
9. Develop a batik motif and print on the given sample.
10. Prepare the print paste with pigment colour and print on the given fabric.
11. Print the given fabric with reactive dyes by Resist Style.
12. Prepare the print paste with reactive dyes and print on the given fabric by discharge style.

Stitches & Seams Practical

1. Practice on Single Needle Lock Stitch machine for given paper / fabric exercise – Straight lines, curves, squares, rectangles, triangles and any other irregular shapes.

2. Prepare atleast five different stitch and seam samples by using different sewing machines and furnish the machine threading diagram along with stitch density and thread consumption details.

3. Developing seams of various types - superimposed, bound, lapped, flat felt and piping.

   Draft The Pattern, Cut & Construct The Following Components For The Given Measurement:
   - Different Neck Lines (At Least 3Types)
   - Different Collars (At Least 3 Types)
   - Different Sleeves (At Least 3 Types)
   - Different Plackets (At Least 3 Types)
   - Different Pockets (At Least 3Types)
   - Slits

Apparel Quality Assurance

Unit I

Importance of Quality. Quality terminologies. Testing: Objectives of Testing - atmospheric conditions for testing lab. Identification of textile fibres. Yarn numbering systems – Determination of yarn count. Yarn strength testing & CSP. Testing of yarn evenness , yarn twist & Hairiness measurement

Unit II

Knitted fabric specifications – Testing of Dimensional stability , Spirality & Bowing. Testing of color fastness to washing, rubbing, perspiration & light - Grey scales and ratings. Brief study about testing of woven fabric.

Unit III

Inspection : Definition - Types of Inspection. Raw materials inspection: fabric inspection systems & Testing of Sewing thread , zippers, Buttons.

Unit IV

In process inspection and its significance in apparel quality. Defects in Sewing, Ironing & Packing. Testing of Seam strength & seam slippage

Unit V

Final inspection procedures. Categories of defects. Package quality testing – care labels. Brief study about Testing Standards. Brief study about Oeko-Tex Standards.

References

1. *J.E. Booth,* Principles of Textile Testing
2. *Elliot b. Grover & D.S. Hamby* -Hand book of textile Testing & Quality Control
3. *B.P.Saville* Physical testing of Textiles
4. *Pradeep V Metha & Satish k. Bhardwaj,* Managing Quality in Apparel Industries

Apparel Costing & Documentation

Unit – I

Introduction to costing - types of costs - Elements of cost. Prime cost - work cost - cost of production - total cost. INCO terms & its relationship with costing.

Unit – II

Cost estimation of yarn, knitted fabric, dyeing, printing & finishing. Woven Fabric Costing: fabric types, yarn consumption, weaving price Cost estimation for cutting, stitching, checking, packing, forwarding, shipping, and insurance.

Unit III

Estimation of factory cost for Woven & Knitted - vest, briefs , shorts, t-shirts, pajamas, children's wear, ladies wear, Woven Shirt, Woven Tops & Bottom. Various factors to be considered in costing for domestic products & international products

Unit – IV

Procedure to start an export firm - Sales contract and its check list. Export Procedure -Pre-Shipment and Post Shipment Credit - 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

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. *S.P.Jain* and *KL. Narang*, "Cost Accounting", Kalyani Publishers,New Delhi.Edn.2005
2. *R.S.N. Pillai* and *V. Bagavathi*, "Cost Accounting",S. Chand and Company Ltd., New Delhi.Edn.2004.
3. Jeremy Rosenau, Apparel Merchandising.
4. Anitha A. Stamper, Evaluation of Apparel Quality.
5. Anitha A. Stamper, Experimental Apparel Construction.
6. B.M. Lal Nigam, Cost Accounting Principles and Practice

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. 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.

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 Check points before cutting - Pilot run or trial run and its importance – Approvals - Types of approvals – Shipping marks – Final inspection procedures – Self, Second and Third party inspection - Effective expedition procedures.

Unit IV 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. Documents recording and maintenance – Claims and reasons for claims - Factory audits – Buyer‟s code of conducts.

Unit V Advertising- scope, importance, types, merits & demerits; sales promotion, personal selling. Retail management. 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., Building Buyer Relationships, *Daragho' Reilly, Jullian J. Gibbs*
2 Inside the Fashion Business, Mc Millan Publishing Co.,.
3. Fashion Merchandising, *Elian Stone*,
4. Apparel Merchanidising, An integrated Approach, Krishnakumar, M, 2010, Abishek Publications
5. Apparel Merchanidising, *Robin Mathew*, Book Enclave Publishers, Jaipur
6. Apparel Merchanidising, *Jerry A & Rosenau*, Fairchild Publications, London

Textile Testing Practical

1. Determination of count of yarn using wrap reel & weighing scale.
2. Determination of lea strength & CSP using lea strength tester.
3. Determination of yarn count from fabric swatch using beesley balance.
4. Determination of twist of single yarn using electronic twist tester.
5. Identification of Fibre using microscope and by chemical test.
6. Determination of CRA of fabric using crease recover tester.
7. Determination of color fastness of given sample to washing by using launderometer.

8. Determination of color fastness of given sample to rubbing by using crockmeter

10. Determination of color fastness of given sample to perspiration by using perspirometer.

11. Determination of dimensional stability% of a given fabric/garment to washing.

12. Determination of fabric drape ability using drape meter.

Pattern making & Garment Construction Practical

Develop patterns and construct the following garments.

1.Men's Vest RNS	2.Men's round neck t-shirt.	3.Men's Polo t-shirt
4.Men's Hooded t-shirt	5.Men's Trouser	6.Men's Boxer shorts
7. Romber	8.Baba Suit	9.A Line Frock
10.Ladies Basic Bodice	11.Nighties	12. Ladies Skirt

Computer Aided Pattern Making Practical

CAD software is used to practice the following styles mentioned,

1. Create Pattern on computer screen, adding details to patterns.
2. Digitizing, saving, extracting & editing patterns from stock library of Patterns.
3. Grading patterns on different size scale.
4. Making Marker plan for cutting fabrics.
5. Estimating lay length and calculating marker efficiency.
6. Fit analysis of the given pattern using 3D CAD software.

Styles

1. Men's Basic T Shirt
2. Raglan with Pocket
3. Men's Polo T Shirt
4. Men's Trouser
5. Men's T-Shirt with hood
6. Men's Inner Garment – Vests RN / RNS
7. Ladies Skirt
8. Women's Nighties
9. Kid's Wear – Romber
10. Kid's Wear – A Line frock
11. Children's Suits And Pyjama

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.*