

**BHARATHIAR UNIVERSITY – COIMBATORE – 641046**  
**B.Sc. APPAREL MANUFACTURING & MERCHANDISING DEGREE COURSE**  
**(For the students admitted during the academic year 2014-2015 Batch onwards)**  
**Scheme of Examination**

Part	Study Components	Course Title	Hours per week	Examinations				Credit
				Dur.Hrs.	CIA	Marks	Total Marks	
<b>Semester – I</b>								
I	Language I		6	3	25	75	100	4
II	English I		6	3	25	75	100	4
III	Core Paper I - Textile Fibres & Yarns		4	3	20	55	75	3
	Core Paper II - Knitting Technology		4	3	20	55	75	3
	Core Paper III - Practical I - Knitting Technology		4	3	40	60	100	4
	Allied Paper I - Computer Application Practical		4	3	40	60	100	4
IV	Environmental Studies #		2	3	-	50	50	2
<b>Semester – II</b>								
I	Language II		6	3	25	75	100	4
II	English II		6	3	25	75	100	4
III	Core Paper IV - Woven Fabrics & Designs		4	3	20	55	75	3
	Core Paper V - Textile Wet Processing		4	3	20	55	75	3
	Core Paper VI - Practical II - Textile Wet Processing		4	4	40	60	100	4
	Allied Paper II - Practical - Woven Fabric Analysis & Designing		4	3	40	60	100	4
IV	Value Education – Human Rights #		2	3	-	50	50	2
<b>Semester III</b>								
III	Core Paper VII - Garment Machineries and Equipments		4	3	20	55	75	3
	Core Paper VIII - Pattern Making & Grading		4	3	25	75	100	4
	Core Paper IX - Principles of Management		4	3	25	75	100	4
	Core Paper X - Practical III - Stitches & Seams		6	3	40	60	100	4
	Allied Paper III - Practical - Pattern Making		6	3	40	60	100	4
	Skill based Subject I - Accountancy for Merchandisers		4	3	20	55	75	3
IV	Tamil @ / Advanced Tamil# (OR) Non-major elective - I (Yoga for Human Excellence)# / Women's Rights#		2	3	50	50	50	2

	<b>Semester IV</b>						
III	Core Paper XI - Textile Testing & Quality Assurance	4	3	25	75	100	4
	Core Paper XII - Garment Construction	4	4	25	75	100	4
	Core Paper XIII - Practical IV - Garment Construction	6	3	30	45	75	3
	Core Paper XIV - Practical V – Textile Testing	6	3	20	30	50	2
	Allied Paper IV - Practical - Computer Aided Pattern Making	4	3	40	60	100	4
	Skill based Subject II - Fashion Business	4	3	20	55	75	3
IV	Tamil @ /Advanced Tamil # (OR) Non-major elective - II (General Awareness #)	2	3	-	50	50	2
	<b>Semester V</b>						
III	Core Paper XV - Apparel Production Management	5	3	25	75	100	4
	Core Paper XVI - Apparel Merchandising	5	3	25	75	100	4
	Core Paper XVII - Fashion Accessories & Trims	5	3	25	75	100	4
	Core Paper XVIII - Garment Costing	5	3	25	75	100	4
	Elective Paper I	5	3	25	75	100	4
IV	Skill based Subject III - Total Quality Management	5	3	20	55	75	3
	<b>Semester VI</b>						
III	Core Paper XIX - International Trade & Documentation	4	3	25	75	100	4
	Core Paper XX - Apparel Retailing	4	3	20	55	75	3
	Core Paper XXI - ERP in Apparel Industry	4	3	20	55	75	3
	Elective Paper II	4	3	25	75	100	4
	Elective Paper III	4	3	25	75	100	4
IV	Skill based Subject IV – Project Work & Viva Voce	10	-	-	-	75*	3
V	Extension Activities @	-	-	50	-	50	2
	<b>Total</b>					3500	140

List of Elective papers (Colleges can choose any one of the paper as electives)		
Elective – I	A	Fashion & Apparel Marketing
	B	Business Communication
	C	Visual Merchandising

Elective – II	A	Research Methods
	B	Industrial Engineering Techniques
	C	Eco Textiles.
Elective - III	A	Clothing Care
	B	Entrepreneurship and Small Business Development
	C	Apparel Brand Management

@ No University Examinations. Only Continuous Internal Assessment (CIA)

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**\*\* Theory 25/75 Marks, Practical 40/60 Marks**

**\* For Viva: 15 Marks (20%) & report: 60 Marks (80%).**

## Semester – I Core Paper I - Textile Fibres & Yarns

### Unit I

Introduction of textile fibers: Classification - Physical and chemical properties. Cotton: Botanical and commercial classification - Properties - End uses. Brief study about Organic cotton Flax: Properties - End uses. Brief study about organic cotton. Wool: Producing countries - Grading - Properties - End uses - Felting –Woolen and Worsted Yarns. Silk: Producing countries – Degumming – Weighting– Properties - End uses. Brief study on wild silk varieties.

### Unit II

Methods of filament spinning. Semi synthetic fibres: Regenerated and modified cellulose - Viscose rayon process flow - HWM fibres - End uses –Brief study of Bamboo, Lyocell, Soya bean fibres.

### Unit III

Polymer – Terminologies – Types of polymers & Polymerization. Synthetic fibres: Brief study about Polyamide, Polyester, Poly Acrylic, and Spandex. Individual fibre properties and trade names – End uses. Drawing and effects. Texturisation: definition, types, properties of textured yarn-its uses. Micro fibres.

### Unit IV

Classification of yarn types- Staple spinning system – Types. Yarn manufacturing Process: ginning-objectives, Objectives and process sequence –Blow room, carding, Drawing, combing, simplex, ring frame, Comparison of carded and combed yarn. Principles and process sequence - Rotor spinning, Compact Spinning.

### Unit V

Post spinning process: cone winding, Doubling, reeling- Ply yarn and single yarn Characteristics. Properties required for export quality hosiery yarns. Study of yarn twist and its importance — Various yarn & package defects. Yarn numbering systems. Blended textiles: Types of blending – Benefits – Double yarn - Properties –Uses. Classification of Sewing threads & applications – core spun sewing thread – Advantages.

### References:

1. *Mishra, S.P.* A Text Book of Fibre Science and Technology, New Age International (P) Ltd Publishers, New Delhi (2000).
2. *Gordon Cook, J.* Hand Book of Textile Fibres – Vol. I & Vol. II.Wood Head Publishing Ltd., Cambridge, England (1984).
3. *Goswami.J.C., Martindale.J.G, Scardino.K.L.,* Textile Yarns,Technology, Structure & Applications, Mahajan Book Distributors, Ahmedabad (1995).
4. *Moncrieff,W,* Man-made Fibres, Butterworth Scientific (1975).
5. Identification of Textile Materials, The Textile Institute,Manchester.
6. *Eric Oxtoby,* Spun Yarn Technology
7. *Sadov.F, Korchagin.M, Matesky.A,* Chemical Technology of Fibrous Material.
8. *K.P.Chellamni,* Yarns and Technical Textiles.
9. *Bernard P. Corbman,* Textiles – Fibre to Fabric.
10. *Wynne, A,* The Motivate Series – Textiles, Macmillan Education Ltd., London (1997).

## **Semester I Core II - Knitting Technology**

### **Unit – I**

Different fabric forming methods-Comparison of weaving and knitting-Principles of weft and warp knitting – Comparison of weft and warp knitting – Classification of knitting machines - Yarn passage diagram of a circular knitting machine – Knitting machine elements and description - Knitting cycle of latch needle with sinker.

### **Unit-II**

Knitting terms and definitions - Principal weft knit stitches - Knit, tuck and miss stitch formation and properties - Representation of weft knit stitches – Study of Basic weft knit structures - Needle gating - Description of circular Rib & Interlock knitting machine – Characteristics of basic weft knit structures – Circular knitting GSM and production calculations.

### **Unit-III**

Single jersey knit fabric structures, their cam and needle order: Plain jersey, Pique, Thick pique, Honey comb, Pearl and Twill. Rib fabric structures, their cam and needle order: 1x1 rib, 2x2 rib, Drop needle, Royal rib, Polka rib, Double half cardigan, Double cardigan, Milano rib, Waffle, Flat back, Swiss double pique and French double pique. Interlock fabric structures, their cam and needle order: Interlock, Eight lock, Ottoman rib, Pin tuck, Texi pique and Ponte di Roma.

### **Unit-IV**

Jacquard knitting - Needle selection techniques – Pattern jack, Pattern wheel , Pattern drum and Computerized jacquard knitting machines – Brief study on specialty weft knit structures – Auto stripe yarn programming – Elastomeric yarn insertion and effects – Knitted fabric faults – Causes and Remedies.

### **Unit-V**

Flat Knitting – Yarn passage diagram of a flat knitting machine – Mechanical type Flat knitting machine - Needle bed assembly – Racking, Carriage and Cam box arrangement - Transfer Stitch and Drop Stitch – Thread diagram, effects and applications – Introduction to computer controlled Flat knitting machine. Concept of fully-fashioned machines and seamless knitwears. Introduction to warp knitting – Warp knitting terminologies – Open lap and closed lap. Basic lapping variations - Detailed study of knitting elements of Tricot and Raschel machines. Knitting action of Tricot and Raschel machines. Comparison of Tricot and Raschel machine. Study of standard two bar warp knit structures and their properties – Lock knit, Satin, Reverse lock knit, Loop raised, Sharkskin and Queens cord.

### **References:**

1. *D.B. Ajgaonkar*, Knitting Technology
2. *David .J.Spencer*, Knitting Technology
3. *Chandrasekara Iyer et al.*, Circular knitting technology
4. *Dr.Samuel Raz* , Flat Knitting
5. *Dr.S.Raz*, Warp Knitting Technology
6. *Peter Lord et al.*, Fabric forming systems

### **Semester I Core III - Knitting Technology Practical**

#### **Part A**

1. Calculate the speed of single jersey knitting machine through gearing diagram.
2. Calculate the speed of rib knitting machine through gearing diagram.
3. Trace the diagram of different cams in the conventional/modern knitting machine with measurements. Also mention the importance of each cam.
4. Trace the take down mechanism and set the mechanism for maximum and minimum tension.
5. Trace the positive feeder mechanism available in the modern knitting machine and set the mechanism for two different feed lengths.
6. Develop a pattern for flat knitting and set the machine accordingly.
7. Develop a pattern for circular knitting and set the machine accordingly.

#### **Part B - Sample Development**

1. Pique
2. Double Pique
3. Lacoste
4. Pearl
5. Twill
6. Two Thread Fleece
7. Mini Jacquard Design
8. Auto Striper
9. Rib Waffle
10. Flat Back Rib
11. Rib drop needle
12. Interlock

#### **and Analysis of 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

**(Any one of the above designs shall be given)**

### Semester – I Allied Paper I - Computer Application Practical

#### MS Office

1. Prepare your class time table using table option in MS Word.
2. Prepare an interview call letter and send using mail merge in MS Word.
3. Design the given advertisement using in MS word. Apply various fonts and pictures.
4. Create line, bar and pie charts for the given data using MS Excel.
5. Prepare students mark statement with the following fields Roll No, Name, Sub1, Sub2, Sub3, Sub4, Sub5. Calculate Total, Average, Result and Grade. Apply Conditional formatting.
6. Prepare employee salary list with fields Employee No, Employee Name, Experience, Basic Pay, HRA,DA,LIC,PF. Calculate Gross Salary & Net Salary based on the following conditions

Experience	HRA	DA	LIC	PF
5 Years & Above	30%	15%	3%	700
Less than 5 Years	15%	5%	3%	700

7. Prepare a power point presentation about a product. Apply animation and slide timing.
8. Prepare a power point presentation about an organization with organization chart. Apply different slide layouts.
9. Search the given topic using any search engine and prepare a report using MS word.
10. Create an EMail ID and use various mail features.

#### Corel Draw

11. Design a T Shirt and apply patterns.
12. Design a wedding invitation
13. Create the given jewellery design
14. Using text tool, create five text designs
15. Design precious stone

#### Photoshop

16. Create a design by extracting objects from given images.
17. Design a realistic pen
18. Create the given design

#### HTML

19. Write HTML code to display the followings
  - Invitation with different font and pictures
  - Scroll text from one end to other end
  - Display the items in bullets
20. Write HTML code to display the Registration form and frame
21. Design five web pages with hyperlinks linking all pages

## Semester II Core IV - Woven Fabrics & Designs

### Unit – I

Classification of fabric forming methods – Weaving preparatory processes - Objects of winding process – Winding types – Passage of material through high speed automatic cone winding machine – Passage of material through precision winding machine – Winding terminologies, open wind and close wind – Winding defects, causes & remedies. Pirn winding – Objects - Passage of material through an automatic high speed pirn winder.

### Unit – II

Objects of warping – Types of warping – Passage of material through high speed modern beam warping machine & sectional warping machine – Warping defects, Causes & remedies. Objects of sizing – comparison of two cylinder, multi cylinder & hot air sizing machines – Sizing ingredients & their functions – Size paste preparation – Sizing defects, causes & remedies.

### Unit – III

Passage of material through a plain power loom – Basic mechanisms of a loom – Primary, secondary & auxiliary motions – Tappet shedding – Cone over pick & under pick mechanisms – Beat up mechanism – Types of let off & take up mechanisms – Fabric defects, causes & remedies.

### Unit – IV

Introduction to weaves – Weave diagram – Plain weave & derivatives – Twill weave & derivatives –  
Satin & sateen weaves – Honeycomb – Huck a back. Objects of dobby & jacquard mechanisms – Types of dobby & jacquard – Study of negative & positive dobbies – Study of single cylinder & double cylinder jacquard mechanisms.

### Unit – V

Shuttle less looms: Introduction - Advantages - Types of shuttle less looms. Introduction to non wovens – Production methods - Applications. Home Textiles.

### References:

1. *R.Marks, A.T.C. Robinson*, Principles of Weaving, The Textile Institute, Manchester (1976).
2. *B.Hasmukhrai*, Fabric Forming, SSM ITT Co operative stores Ltd, Komarapalayam (1996).
3. *Prof.N.N.Banerjee*, Weaving Mechanism, Vol. I & Vol. II, Published by Smt.Tandra Banerjee, West Bengal (1999).
4. *Prof.J.L.Chakravorty*, Mechanism of Weaving Machines,Smt.B.Chakravorty, Serampore, W.B. (1984).
5. *Sabit Adanur*, Handbook of Weaving, Technomic Publishing Company, Inc, USA (2001).
6. *Peter Schwartz*, Trevor Rhodes, Mansour Mohamed, Fabric Forming Systems, Mahajan Book Distributors, Ahmedabad (1996).
7. *K.T.Aswani*, Fancy Weaving Mechanism, Mahajan Book Distributors, Ahmedabad (1990).

8. *N.Gokarneshan*, Fabric Structure and Design, New Age International Publishers, New Delhi (2004).
9. *Z.Grosicki*, Watson's Textile Design and Color and Advanced Textile Design and Color , Newnes – Butter Worth, Universal Publishing Corporation, Bombay (1988).
10. *Blinov.I, Belay.S*, Design of Woven Fabrics, MIR Publishers, Moscow (1988).

### **Semester II Core V - Textile Wet Processing**

#### **Unit – I**

Water: water hardness – types - softening process: ion exchange - sequestering agent methods - terminology & terms related to textile industries (ph, acid, base, oxidation, reduction) – role of textile auxiliaries. Preparatory process sequence for woven & Knitted fabrics.

#### **Unit – II.**

Preparatory process: singeing – objectives – types of singeing, Desizing – objectives –methods, scouring – objectives –methods. bleaching –objectives - types of bleaching agents – advantages of peroxide bleaching – optical whiteners. Mercerizing –objectives - types.

#### **Unit – III.**

Dyeing: classification of dyes – principles of different dyeing - direct, reactive, vat, & disperse dyes – principles of dyeing of synthetic & blended textile materials - after treatments – types & principles of different dyeing machines : winch – soft flow – cabinet - cheese and HTHP machines – merits & demerits.

#### **Unit – IV.**

Printing - methods of printing – screen preparation. styles of printing – direct, resist, discharge, transfer . print paste ingredients –after treatments. pigment printing. Garment printing : flock , HiDensity, Foil, Plastisol, foam, khadi – burnout printing. Digital printing.

#### **Unit – V.**

Finishing: objectives of finishing – temporary and permanent finishes. Chemical finish: wrinkle free – softeners – anti microbial – fire retardant. Mechanical finish: calendaring – raising – shearing. Bio polishing. Stone washing. Application of enzymes in textile processing. Pollution - Brief study about ETP

#### **References:**

1. Technology of textile processing (vol 1-2), Sevak Publications – V.A.Shenai
2. Dyeing and chemical technology of textile fibres, Charles Griffin & Co – E.R.Trotman
3. Technology of Bleaching and Dyeing of Textile Fibres Vol.1, Part-I,1979, Mahajan Book Publishers, - *Chakravarthy RR And Trivedi S.S*
4. The Bleaching and Dyeing of Cotton Material 1983, Weaver's Service Cent *Prayag R.S.*,
5. Chemical Processing of Synthetic Fibres and Blends 1982, John Wiley & Sons, New York. *Datye K.V and Vaidhay A.A.*,

6. Processing of Manmade Fibres 1975, MIR Publishers, Moscow.- *Usenko V*,
7. Colour for Textiles: A User's Handbook, Society of Dyers and Colourists(1993) - *Wilfred Ingamells*,
8. Cellulosics Dyeing, Society of Dyers and Colourists(1995) - *John Shore*,
9. Wool Dyeing, Society of Dyers and Colourists(1992) - *Lewis.D.M.*,
10. Textile Coloration and Finishing, Carolina Academic Press, Durham, North Carolina (1996) - *Warren.S.Perkins*,

### **Semester II Core VI - Textile Wet Processing 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 reactive dyes.
5. Dye the given cotton sample with hot brand reactive dyes.
6. Dye the given cotton sample with vinyl sulphone dyes.
7. Dye the given cotton sample with reactive H-E dyes.
8. Dye the given silk material with acid / basic dyes.
9. Dye the given wool material with acid / basic dyes.
10. Dye the given polyester sample using carriers.
11. Dye the given fabric for the given pattern using Tie & Dye Technique.
12. Develop a batik motif and print on the given sample.
13. Prepare the print paste with pigment colour and print on the given fabric.
14. Print the given fabric with reactive dyes by Resist Style.
15. Prepare the print paste with reactive dyes and print on the given fabric by discharge style.

## **Semester II Allied II - Woven Fabric Analysis & Designing Practical**

### **Part A**

To analyse the following particulars of woven fabrics

- Woven structural analysis: Design, draft, peg plan, denting plan.
  - Warp particulars: Material of warp - ends per length - count, direction of twist, Crimp percentage, cover factor, warp pattern.
  - Weft particulars: Material of weft - picks per unit length- count, direction of twist, twist per length, Crimp percentage, cover factor and warp pattern.
  - Fabric particulars: Total Cover factor, Weight of fabric and thickness.
  - Loom requirements: Shedding mechanism, heald count, and count.
1. Plain and Twill fabrics
  2. Demonstration - production of plain and twill fabrics
  3. Satin/Sateen and Honey comb fabrics
  4. Demonstration - production of satin/sateen and honey comb fabrics
  5. Velvets/velveteen
  6. Extra thread figuring fabric(s)

### **Part B**

1. Basics of Raster and vector images, types, image formats and colour concepts.
2. Development of dobby designs (part –I) based on interactiveness of weave.
3. Development of dobby designs (part –II) based on interactiveness of weave and colour order.
4. Development of motifs.
5. Development of jacquard designs (part –I) using - colour and weave selection concepts – shade and thread balance.
6. Development of jacquard designs (part –II) Spot figuring – Drop.
7. Development of jacquard designs – Ogee base.
8. Development of jacquard designs – Diamond base.
9. Development of jacquard designs – Sateen base.
10. Multi layer design- extra warp/ weft design concepts.

### **Semester – III Core Paper VII - Garment Machineries and Equipments**

#### **Unit I**

Introduction to garment industry process details. Spreading machine: Types and working procedures. Cutting machines: Types of cutting machines and its application – Detailed study on band knife, straight knife, drills & notches.

#### **Unit II**

Classification of garment manufacturing machines & applications. Studies on different sewing machine – Lockstitch machine (chain stitch formation) - Features of advanced lock stitching machines. Overlock machine – Classification - Three thread overlock machine – Stitch forming elements. Brief study on double needle lock stitch machine, flat lock machines.

#### **Unit III**

Sewing machine shapes - Sewing machine bed types-Description and application of each bed – Flat bed - Cylinder bed - Post bed – Applications. Feed mechanisms – Types - Drop feed – Compound feed - Unison feed – Drop and variable top feed -Differential bottom and variable top feed (description of each type of feed mechanisms with sketch).

#### **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 – Bar tack machine - 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.

### **Semester – III Core Paper VIII - Pattern Making & Grading**

#### **Unit I**

Introduction – Concept of basic pattern and grading – Different types of block pattern. Methods of pattern making with special reference to pattern drafting - Pattern making tools – Various pattern production terms–Standard body measurements for men’s wear, women’s wear and kids wear of different countries. Style wise component parts of a garment.

#### **Unit II**

Pattern positioning and lay out – Concept of pattern layout - Rules and methods of pattern layout – Adjusting the patterns to fabric. Fitting: Definition – Principles for a good fit– Checking the fit of a garment – Solving fitting problems in various garments.

#### **Unit III**

Draping – Importance of draping – Dress form and types – Draping steps for basic bodice, skirt, pants. Procedure to develop necklines: Jewel neck - Round neck - ‘U’ neck - Square neck - Pentagon neck - Star neck - Inside and outside scallop neck. Procedure to develop sleeves: Plain and puff sleeves.

#### **Unit IV**

Procedure to draft the ¼th patterns for Ladies wear: Blouse, kameez, salwar, midi, midi top. Style detailing – Skirt, Plackets, Pockets, Pants, Sleeve, Collar, Necklines.

#### **Unit V**

Basic principle of dart manipulation – Displacement of bust dart (waist – side seam, armhole – neck of front edge).Grading – Definition – Principles of grading - Master grades – Basic back & front grades – Grading of basic sleeve, basic collar, trousers.

#### **References:**

1. *Helen Joseph Armstrong*, Pattern Making For Fashion Design, Harper Collins Publishers (1987).
2. *Winifred Aldrich*, Metric Pattern Cutting, , Blackwell Science Ltd, England (1994).
3. *Winifred Aldrich*, Metric Pattern Cutting for Men’s Wear, Blackwell Science Ltd, England (1990).
4. *Winifred Aldrich*, Metric Pattern Cutting for Children’s Wear (From 2 – 14 Years), Blackwell Science Ltd, England (1991).
5. *Gerry Cooklin*, Pattern Cutting for Women’s Outerwear, Blackwell Science Ltd, England (1992).
6. *Gerry Cooklin*, Pattern Grading for Women’s Clothes, Blackwell Science Ltd, England (1990).
7. *Gerry Cooklin*, Pattern Grading for Men’s Clothes, Blackwell Science Ltd, England (1992).
8. *Gerry Cooklin*, Pattern Grading for Children’s Clothes, Blackwell Science Ltd, England (1991).
9. *Gerry Cooklin*, Master Patterns and Grading for Women’s Outsizes, Blackwell Science Ltd, England
10. *Natalie Bray*, Dress Pattern Designing, Blackwell Science Ltd, England (1986).
11. *Natalie Bray*, More Dress Pattern Designing, Blackwell Science Ltd, England

12. *Natalie Bray*, Dress Fitting, Blackwell Science Ltd, England, (1978).
13. *Maccam, Dinald H*, How to Make Sensible Pattern.
14. *Gollian Holman*, Pattern Making Made Easy.
15. *Inju Kim*, Apparel Making in Fashion Design, Fairchild Publications Inc. New York (2002).
16. *Winifred Aldrich*, Fabric, Form and Flat Pattern Cutting, Om Book Service, New Delhi (1996).

### **Semester –III Core Paper IX - Principles of Management**

#### **Unit I**

Nature and scope of management – Management Science / Art – Development of management theory – Scientific management – Henry Foyal’s principles of management.

#### **Unit II**

Planning - Meaning and purpose of planning – Steps in planning – Types of planning - Objectives and policies – Objectives, policies, procedures and methods, nature and types of policies.

#### **Unit III**

Organizing – Types of organization – Organizational structure – Span of control – Committees. Delegation and centralization line & staff relationship - Staffing – Sources of recruitment – Selection process - Training methods – Performance appraisal.

#### **Unit IV**

Directing – Nature and purpose of directing – Motivation – Discipline – Leadership – Supervision – Communication – Requirements for effective controls – Critical control points and standards.

#### **Unit V**

Controlling – Need for co-ordinating – Meaning and importance of control - Control process – Types of control - Decision making – Process of decision making – Types of decisions – Problems involved in decision making.

#### **References**

1. *O.P.Khanna*, Industrial Engineering And Management, Dhanpat Rai Publications, New Delhi (2006).
2. *Patrick.J.Montana and Bruce.H.Charnov*, Management, Barrows (2000).
3. *D.P.Jain*, Business Organisation and Management, Vrinda Publications (1999).
4. *Harold Koontz and Heinz Weihrich*, Essentials of Management, Tata McGraw Hill (1998).
5. *James.A.F.Stoner, R.Edward Freeman and Danier.R.Gilbert.Jr.*, Management, Prentice Hall (1995).
6. *George.R.Terry and Stephen. G.Franklin*, Principles of Management, A.I.T.B.S (2003).
7. *Dingar Pagore*, Principles Of Management
8. *L.M.Prasath*, Principles Of Management
9. *K.Balasundaram*, Industrial Engineering & Management – IV Edition, Shree Ramalinga Sowdeswari Publications, Coimbatore (1986).

### **Semester III Core Paper X - Stitches & Seams Practical**

#### **List of Experiments**

1. Practice on Single Needle Lock Stitch machine for given paper / fabric exercise – Straight lines and curves - Fabric exercises – 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
4. Develop the samples of components such as
  - a. Round neck
  - b. Scallop neck
  - c. Gents placket
  - d. Ladies placket
  - e. Cross pocket
  - f. Band collar and
  - g. Henley band

### **Semester – III Allied Paper III - Pattern Making Practical**

#### **List of Experiments**

##### **Men's Wear**

- |  |                                  |                            |
|--|----------------------------------|----------------------------|
| 1. Basic t-shirt with half sleeve.<br>full sleeve. | 2. Polo t-shirt with half sleeve | 3. T-shirt with            |
| 4. T-shirt with raglan sleeve.                     | 5. Men's Trouser                 | 6. Brief and boxer shorts. |
| 7 Vest with and without sleeve.<br>Jacket.         | 8. Night dress                   | 9. Men's Hood              |

##### **Kid's Wear**

- |                 |              |           |         |
|-----------------|--------------|-----------|---------|
| 1. A line frock | 2. Baba suit | 3. Romber | 4. Pant |
|-----------------|--------------|-----------|---------|

##### **Women's Wear**

- |                        |             |           |                |                   |
|------------------------|-------------|-----------|----------------|-------------------|
| 1. Ladies Basic Bodice | 2. Nighties | 3. Blouse | 4. Ladies Tops | 5. Skirt "A line" |
|------------------------|-------------|-----------|----------------|-------------------|

### **Semester III Skill Based Subject I - Accountancy for Merchandisers**

#### **Unit – I**

Introduction – book keeping - meaning of accounting – types of accounts – personal – real – nominal – end use of accounting – financial accounting – management accounting. Personal accounts – impersonal accounts – single entry system – double entry system – Advantage – difference

#### **Unit – II**

Journal ledger – trial balance – how to prepare a trial balance – limitations of trial Balance – rectification of errors – suspension. Subsidiary books – invoice – debit note – Credit note – cash receipts – voucher – simple problems

#### **Unit – III**

Final accounts – nature – matching principles – limitations –difference between trading profit and loss account –p/l account and balance sheet – adjustments in final accounts

#### **Unit – IV**

Depreciation – meaning – types – straight line methods or fixed installments or equal Installment method. Diminishing balance or reducing installment method. Revaluation Method (simple problems only)

#### **Unit – V**

Bill of exchange – accounts of non trading concerns – distinctions between capital and revenue expenditure – differed revenue expenditure – capital and revenue receipts – balance sheet –bank reconciliation statement –single entry or accounts from incomplete records – meaning – types – pure single entry system – simple single entry system – quasi single entry system.

**Note for the question paper setting:** Problems and theory Questions shall be 60% and 40%.

#### **References**

1. N.Vinayakam, P.L.Mani, K.L.Nagarajan – *Principles of Accountancy* – S.Chand & Company Ltd.,
2. T.S.Grewal – *Introduction to Accountancy*– S.Chand & Company Ltd.,
3. R.L.Gupta, V.K.Gupta, M.C.Shukla – *Financial Accounting* – Sultanchand & sons
4. T.S.Grewal, S.C.Gupta, S.P.Jain – *Advanced Accountancy*– Sultanchand & sons
5. K.L.Narang, S.N.Maheswari – *Advanced Accountancy*– Kalyani publishers
6. S.K.Maheswari, T.S.Reddy – *Advanced Accountancy*– Vikas publishers
7. A.Murthy – *Financial Accounting* – Margham Publishers
8. P.C.Tulsian – *Advanced Accountancy* – Tata McGraw Hill Companies.
9. A.Mukherjee, M.Hanif – *Modern Accountancy. Vol.1*– Tata McGraw Hill Companies

## **Semester IV Core-XI - Textiles Testing & Quality Assurance**

### **Unit I**

Importance of Quality. Quality terminologies. Testing: Objectives of Testing - Standardization of testing - sampling - measurement – types of error - repeatability & reproducibility -atmospheric conditions for testing lab. Brief study on fibre properties – FQI. – Identification of textile fibres.

### **Unit II**

Yarn numbering systems – Determination of yarn count: wrap reel, electronic yarn count balance, quadrant balance, beesley balance - count calculations. Yarn strength: Lea strength tester and CSP.

Yarn evenness: Brief study on uster unevenness. Yarn twist: Terms - Electronic twist tester. Hairiness measurement.

### **Unit III**

Knitted fabric specifications - Bursting strength testing – testing of fabric resistance to snagging, abrasion & pilling - fabric handle - drape and stiffness - Dimensional stability of knitted fabric – spirality -. Testing of color fastness to washing, rubbing, perspiration & light - Grey scales and ratings - Reasons for poor color fastness - Seam strength & seam slippage. Brief study about testing of woven fabric.

### **Unit IV**

Meaning – Definition - Types of Inspection – Study on Incoming materials inspection: fabric inspection systems & Testing of zippers, Buttons, Waistbands, Sewing thread.

### **Unit V**

In process inspection and its significance in apparel quality. Final inspection – Risks involved – AQL – MIL STD. Garment appearance after washing – 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. *P. Angappan & R. Gopalakrishnan*, Textile testing
5. *Pradeep V Metha & Satish k. Bhardwaj*, Managing Quality in Apparel Industries
6. ISI standards [BIS] / AATCC / ASTM – Technical manuals

## **Semester IV Core XII - Garment Construction**

### **Unit I**

Different departments & their role in garment industry. Product types and its influence. Garment analysis and its classification - measurement and size charts for men, women, and children - requirement and breakdown of garments - flow process - torso and bifurcated garments.

### **Unit II**

Stitches and seams: basic principles of stitch formation – classification of stitches based on federal standards – detailed study of application of all stitches - comparison of stitches.

### **Unit III**

Detailed study on seams classification as per federal standards –seam finishes – devices for introducing fullness. Thread consumption for various types of stitches and garments. Fabric selection techniques – Additional dress making techniques-trimming details for quality look.

### **Unit IV**

Detailed study on various stitching, sewing and assembly defects - causes & remedies: skip stitch, unbalanced, puckering, gathering, needle defects, thread problems – quality of threads and its impact on sewing quality – sew ability and its influencing factors – needle cutting index.

### **Unit V**

Fusing and its requirements – fusing process – interlinings – fusible resin types – factors for fusing equipment. Introduction to trims and accessories attachments -label, zips, fasteners – sewing thread types and ticket numbering.

### **References:**

1. Apparel Manufacturing – Hand Book – *Jacob Solinger*
2. Technology Of Clothing Manufacture – *Herold Carr & B.Latham*
3. Knitted Clothing Technology – *T.Bracken Berry*
4. Technology Of Stitches & Seams – *Coats Viyella Limited*
5. Apparel Manufacturing Management System – *Roche Daniel*
6. Knitting and Apparel Manufacture – *Sureshkumar, SSMITT Stores*

### **Semester IV Core XIII - Garment Construction Practical**

Draft The Pattern, Cut & Construct The Following Components For The Given Measurement:

1. Different Neck Lines (At Least 3Types)
2. Different Collars (At Least 3 Types)
3. Different Sleeves (At Least 3 Types)
4. Different Plackets (At Least 3 Types)
5. Different Pockets (At Least 3Types)
6. Slits

and develop and construct the following.

- |                        |                        |                                      |
|------------------------|------------------------|--------------------------------------|
| 1. Men's Vest RN       | 2.Men's Vest RNS       | 3.Men's round neck t-shirt.          |
| 4.Men's Polo t-shirt   | 5.Men's Hooded t-shirt | 6. Men's T-shirt with raglan sleeve. |
| 7. Men's Trouser       | 8.Men's Boxer shorts   | 9.Men's Kimono Sleeve                |
| 10. Romber             | 11.Baba Suit           | 12.A Line Frock                      |
| 13.Ladies Basic Bodice | 14.Nighties            | 15Ladies Skirt                       |

### **Semester IV Core Paper XIV - Textile Testing - Practical**

1. Determination of count of yarn using wrap reel & weighing scale.
2. Determination of yarn count using electronic yarn count balance.
3. Determination of lea strength & CSP using lea strength tester.
4. Determination of yarn count from fabric swatch using beesley balance.
5. Determination of twist of single yarn using electronic twist tester.
6. Determination of twist of double yarn using electronic twist tester.
7. Analysis of given fabric sample for determining weight, CPI, WPI, SL, CL & yarn count.
8. Identification of Fibre using microscope and by chemical test.
9. Analysis of Blend composition of given fabrics.
10. Determination of thickness of fabric using fabric thickness gauge.
11. Determination of CRA of fabric using crease recover tester.
12. Determination of color fastness of given sample to washing by using launderometer.
13. Determination of color fastness of given sample to rubbing by using crockmeter
14. Determination of color fastness of given sample to perspiration by using perspirometer
15. Determination of dimensional stability% of a given fabric/garment to washing.

### **Semester IV Allied Paper IV - Computer Aided Pattern Making – Practical**

CAD software is used to practice the following on the 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 High Neck Shirt
5. Men's Boxer Short
6. Men's Bermudas Short
7. Men's Trouser
8. Men's Kimono Sleeve
9. Men's V – Neck Shirt
10. Men's T-Shirt with hood
11. Men's Inner Garment – Vests RN / RNS
12. Men's under garment: briefs with inner waist band or outer waist band of various models - trunk type.
13. Ladies Skirt
14. Ladies Blouse & Ladies Tops
15. Women's Nighties
16. Kid's Wear – Romper
17. Kid's Wear – A Line frock
18. Children's Suits And Pyjama

## **Semester IV Skill Based Subject II – Fashion Business**

### **Unit I**

Fashion Environment: Introduction to fashion industry - Fashion environment - Demographic & Psychographic, Economic, Sociological and psychological factors – Fashion cycle. Fashion business- Designer's role, manufacturer's role and retailer's role. Leaders of fashion - Theories of fashion adoption.

### **Unit II**

Fashion Business: Scope of fashion business - Primary level, secondary level and retail level – Type of fashion designers - Role of fashion designers – Principles of merchandising – Types of merchandising – Role of merchandiser - Effect of Consumer – Types of buyers – communication with buyers and consumers.

### **Unit III**

Fashion Forecasting: Fashion forecasting – Need for forecasting - Forecasting agencies – Role of forecasting agencies - Fashion direction and recent trends – Product development – product mix, factors affecting product mix.

### **Unit IV**

Fashion Market: Market research: Types of market – Retail & wholesale market – Domestic & international market – Designers labels – Chain stores – Brand market. Sourcing: method of sourcing – Raw material sourcing – Accessory sourcing . Resource planning – Supply and demand chain analysis – Just in time technology.

### **Unit V**

Advertisement and Promotions: Advertising: purpose – methods - types of advertising media - Sales promotion methods - Trade fairs and fashion shows as sales promotion techniques - Feedback to production and marketing departments - Use of computers as a tool for effective merchandising - Fashion auxiliary services.

### **References**

1. Fashion Merchandising, *Elia Stone*,
2. Inside the Fashion Business.. Mc Millan Publishing Co.,
3. Apparel Merchandising
4. Fashion : Concepts to Consumers

## **Semester V Core XV - Apparel Production Management**

### **Unit – 1**

Introduction To Garment Industry Plant Location – Location Economics – Plant Layout – Process Layout – Product Layout – Combination Layout – Introduction To Balancing Theory – Balance Control – Balancing Exercises For Garment Industry.

### **Unit – 2**

Materials Management: classification of materials – importance and objectives of Materials Management. Inventory – classification – inventory control models- factors influencing inventory control – ABC analysis - EOQ. MRP: introduction – concepts and advantages-factors influencing the requirements of inventory. CRP : types- measurement & determination of capacity – CRP inputs & outputs. optimum level of production.

### **Unit – 3**

Concept And Need – Method Study And Work Measurement – Techniques – Process Chart Symbol – Process Flow Chart – Flow Diagrams – String Diagrams – Multiple Activity Chart – Principles Of Motion Economy – SIMO Chart – Time Study Methods – Standard Time Data – Ergonomics With Special Reference To Garment Industry.

### **Unit – 4**

Methods of Production Systems – Job, Mass & Batch – Section Systems, Progressive Bundle System & ‘Synchro’ System – Conveyor Systems – Unit Production System – Quick Response. Productivity Concepts – Measurement Of Productivity – “Man Machine Material” – Criteria For Increasing Productivity.

### **Unit – 5**

Function, Qualitative And Quantitative Analysis Of Production - Coordinating Departmental Activities - Flow Process And Charts For Garment - Scheduling Calculations - Assigning Operators Optimally - Setting Up Complete Balanced Production Lines To Produce Given Amount Of Garments

### **References:**

1. Technology Of Clothing Manufacture – *Carr & Latham*
2. Apparel Manufacturers Handbook – *Jacob Solinger*
3. Introduction To Clothing Manufacture – *Gerry Cooklin*
4. Introduction To Production Management – *A. J. Chuter*
5. Personal Management And Industrial Relations – *Tripathi*
6. Industrial Engineering And Management – *OP. Khanna*

## **Semester V Core XVI - 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**

Inspection and its types – Testing – 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 Merchandising, An integrated Approach, Krishnakumar, M, 2010, Abishek Publications
5. Apparel Merchandising, *Robin Mathew,* Book Enclave Publishers, Jaipur
6. Apparel Merchandising, *Jerry A & Rosenau,* Fairchild Publications, London

## **Semester V Core XVII - Fashion Accessories & Trims**

### **Unit I**

Accessory and its importance – the concept – the difference between accessories and trims – specifications – standards pertaining to accessory – types of accessories and trims. sourcing of accessory – single sourcing – multiple sourcing – advantages and disadvantages of sourcing – vendor evaluation – rating – vendor based rationalization

### **Unit II**

Sewing threads and its applications – quality control in sewing thread – types of thread packages – embroidery threads – quality requirements – appliqué works – sequence works, beads, crystals & stones

### **Unit III**

Functions and application of accessories and trims – zippers – quality parameters and testing procedures – buttons – types – testing procedures – lace – elastic, draw strings – velcro – snap fastness – hooks performance and properties of components and trims.

### **Unit IV**

Labels and its types – testing procedures – tags and its types – quality parameters and testing procedures – lining – interlining – poly bags - master poly bags – hangers – cartons – wrappers – pouches for inner wear.

### **Unit V**

Trends in accessory and trims – forecasting procedure –innovation in accessory industry – costing procedure in accessory and trims – sample collections – presentation – possible defects and remedies.

### **References:**

1. Technology of clothing manufacture – *Carr & Latham*
2. Apparel manufacturers handbook – *Jacob Solinger*
3. Introduction to clothing manufacture – *Gerry Cooklin*
4. Know your Fashion Accessories – *Celia Stall Meaows*, Fairchild Publications, New York, 2004
5. Singer creating Fashion Accessories – *Cy. De Cosse Incorporated*, IAFL Publications

### **Semester V Core XVIII - Garment Costing**

#### **Unit – I**

Principles of costing - requirements of good costing system - cost unit - types of costs - Elements of cost - direct material cost - direct expenses - direct wages - indirect materials - indirect expenses - indirect labour - overheads - prime cost - work cost - cost of production - total cost. INCO terms & its relationship with costing

#### **Unit – II**

Budgeting: The budgeting process: Budgeting principles for the apparel industry- Fixed vs.variable budget - Master budget-laminations of budgets- any justification effort -Planned Vs Actual Cost.

#### **Unit III**

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 – IV**

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 – V**

Determining Pricing of apparel products: Price elasticity of demand and supply, sample costing- marginal revenue and marginal cost, cost plus pricing methods;, Full cost pricing, conversion cost pricing, differential cost pricing ,variable cost pricing, direct cost pricing derivation of cost of apparel products-woven/knits.

#### **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. Apparel Costing, A functional Approach – *Krishnakumar, M*, Abishek Publications, Chandigarh, 2012

### **Semester V Skill Based Subject III - Total Quality Management**

#### **Unit I**

Quality – Evolution of Quality management – Quality Function and Quality Planning – Basic concepts of Total Quality Management (TQM) – Principles of TQM – Important Phases of TQM – Quality Trilogy – Four pillars of TQM – PDCA cycle & PDSA cycle – Kaizan concept – 5’S Philosophy – Quality Circles

#### **Unit II**

Statistical Quality Control (SQC) : Definition – SQC techniques – Frequency distributions: Discrete and Continuous – Measures of Central tendency: Mean, Median & Mode – Measures of dispersion: Range, Mean Range, Mean Deviation, Percentage Mean Deviation, Standard Deviation, Coefficient of Variation – Normal distribution – Binomial distribution – Poisson distribution

#### **Unit III**

Control charts: concepts and uses – Control limits – Control charts for Variables and Attributes: X Charts – R chart – P chart – NP chart – C chart – Acceptance sampling – Types of sampling plans: Single, Double and Multiple Sampling plans – OC curves – AQL and LTPD – Sampling errors and sampling risks – Producer’s risk and Consumer’s risk

#### **Unit IV**

ISO 9000 Standards: Meaning & Definition – ISO 9000 family of standards – Elements of ISO – Benefits of ISO 9000 System – Study on ISO 9001:2000 Guidelines and Standard Clauses – Implementation Procedures and requirements for ISO 9001:2000 system – Quality Manual and its contents – Accreditation and Certification agencies – Quality audit – Types of quality audit – Audit procedure – Requirements and characteristic of a Quality auditor

#### **Unit V**

Environmental Management System (EMS) – Meaning & Definition – Elements of EMS – Benefits of EMS – Environmental Policies – Implementation of ISO 14000 – Study on other management systems : SA8000, OHSAS 18000, WRAP.

#### **References**

1. *Dr. S.P.Gupta*, “Statistical Methods”
2. *J.M. Juran*, “Quality Control Handbook”
3. *V.K.Kapoor*, “Statistics”
4. Total Quality Management – *Bhaskar, S* - Anuradha Publications, Kumbakonam.
5. Total Quality Management – *Shridhara Bhat, K* -, Himalaya Publishing Corporation New Delhi
6. Handbook of Total Quality Management - *Armstrong* , Jaico Publications, New delhi.

## **Semester VI Core XIX International Trade & Documentation**

### **Unit – I**

Firm establishment: introduction – export promotion councils and their role – registration formalities - rcmc –IE code – RBI code – garment classification and categories for various countries – quota – quota distribution methods – quota transfer

### **Unit – II**

Foreign trade documents: need, rationale and types of documents relating to goods – invoice – packing note and list – certificate of origin – certificate relating to shipments – mate receipt – shipping bill – caret ticket – certificate of measurement – bill of lading – air way bill – documents relating to payment – letter of credit – types of l/c - bill of exchange – letter of hypothecation – bank certificate for payment – document relating to inspection – certificate of inspection – gp and other forms.

### **Unit – III**

Import procedure : import license – procedure for import license – import trade control regulation procedure – special schemes – replenishment license – advance license – split up license – spares for after sales service license – code number – bill of entry.

### **Unit – IV**

Shipment and customs: preshipment inspection and quality control – foreign exchange formalities – preshipment documents - documentation terms - excise and customs clearance of export cargo – shipment of goods and port procedures – customs clearance of import cargo. Post – shipment formalities and procedures – claiming duty drawback and other benefits.

### **Unit – V**

Payment and deliveries: terms of delivery – INCO terms – EXW – FCA – FOB – CFR – CIF – CPT – DAF – DDP – DDU. Terms of payment – open account – cheque – cash payment against documents – bank payment against documents (LC) – security and cost of various payment terms – assessing the risk in payment – role of ECGC and standard policy.

### **References:**

1. Govt. Of India : Hand Book Of Import And Export Procedures.
2. *Bose. A.* : Streamline Your Export Paper Work., International Trade Form, Oct – Dec 1965.
3. How To Start Export.
4. CBI Booklets – Netherland
5. ECG C Services And Guidelines
6. AEPC Booklets

## **Semester VI Core XX Apparel Retailing**

### **Unit I**

Retail & Retailing – Meaning & definition – Scope of apparel retailing – Retailing terminologies – Types of retailers and retail formats – Global retailing scenario – Retailing scenario in India – Functions of retailers

### **Unit II**

Retail strategies : Operational excellence , Product differentiation, Customer intimacy – Growth strategies – Market expansion strategies – Store planning – Location planning – Store design – Store design & retailing image mix – Space mix – Effective retail space management – Store layout – Floor space management

### **Unit III**

Retail merchandising – Merchandise planning – Merchandise hierarchy – Buying function – Category management – Mark up & Mark down – Shrinkage in merchandising management – Gross margin return on inventory – Supply chain management in apparel retailing – ERP in apparel industry

### **Unit IV**

Retail operations – Significant areas – Store operating parameters related to customers, stocks, space, employee, finance – Managing retail personnel – Manpower planning – Types of employees in retail – Remuneration structure – Visual Merchandising (VM): Definition & Meaning – VM Techniques – Elements of VM – Functions of a Visual Merchandiser

### **Unit V**

Retail Brands and Branding – Functions of brands – Types of brands – Branding strategies – Store brands or private labels – Store brands Vs National brands – Famous apparel retail brands – Packaging – Functions of packaging – Kinds of packaging – Requisites of good package – Customer service management in retail – Service management model

### **References**

1. Jaico Books, “Retail Management – Functional Principles & Practices”, *Gibson G. Vedamani*
2. “Retail management “
3. Retail Merchandising – part I
4. Art of retailing – *Arun Mahabharata* , Lotus press, New Delhi, 2008
5. Fundamentals of retailing – *Madan*, Tata Mcgraw, New Delhi
6. Retailing Management – *Levy*, Diamond Publications, Delhi

## **Semester VI Core Paper XXI ERP in Apparel Industry**

### **Unit 1**

Introduction: ERP: An Overview, enterprise – an overview, types of Enterprises, need for ERP, benefits of ERP, ERP and related technologies, Business Process Reengineering (BPR), Benefits of

BPR

### **Unit II**

Implementation of ERP: ERP implementation lifecycle, implementation methodology, hidden costs, organizing the implementation, vendors, consultants and users, contracts with vendors, consultants and employees, project management and monitoring

### **Unit III**

The Business Modules: Business modules in an ERP package - finance, manufacturing, human resources, plant maintenance, materials management, quality management, sales and distribution. Significance and advantages of each of the modules

### **Unit IV**

ERP in apparel industry: Production resource planning – principles and management of and demand chain analysis– quick response strategy - material management for ‘Quick Response’ – ‘Just in Time

(JIT) Technology’; Production planning, costing and merchandising software

### **Unit V**

Computer Applications: Management Information System in garment industry – EDI in garment technology; Use of Computers in Designing, Pattern making, computerized production systems, communicating with vendors and buyers; Telephone, fax, video conferencing, intranet, internet, etc; Export documentation, retailing; Methods of communicating with consumers

### **References**

1. *Alexis Leon*, “ERP Demystified”, Tata McGraw Hill, New Delhi, 2000
2. *Glock Ruth E. and Kunz Grace I.*, "Apparel Manufacturing - Sewn Product Analysis", Blackwell Scientific Publications, 1996
3. *Joseph A. Brady, Ellen F. Monk, Bret Wagner*, “Concepts in Enterprise Resource Planning”, Thompson Course Technology, USA, 2001
4. *Garg Vinod Kumar and Venkitakrishnan N. K.*, “Enterprise Resource Planning – Concepts and Practice”, PHI, New Delhi, 2003
5. Enterprise Resource Planning, Theory & Practice – *Rahul Altekar , V.*, Printice Hall of India, New Delhi, 2005
6. Enterprise Resource Planning– *Leon , V.*, Diamond Publications, New Delhi.
7. Enterprise Resource Planning – *Mary Sumner*, Diamond Publications, New Delhi, 2001

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### **Semester VI Skill Based Subject IV – Project Work & Viva Voce**

Students have to undertake project in the areas of Knitting / Weaving/ Processing /Garment Manufacturing industry. A Team consisting of Internal & External Experts will evaluate the Project Report. The Viva-Voce will be conducted.

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### **Semester V Elective I – A - Fashion & Apparel Marketing**

#### **Unit I**

Meaning and classification of marketing, Fashion marketing, fashion market – size and structure, marketing environment – micro and macro marketing environment, trends in marketing environment

#### **Unit II**

Marketing function – assembling, standardization and grading and packaging, product planning and development, importance of fashion products, nature of fashion products. The fashion industry and new product development, product-mix and range planning, fashion and related cycles.

#### **Unit III**

Fashion advertising and preparation of advertising for apparel market, advertising media used in apparel market – advantages and limitations, advertising department – structure and functions, advertising agencies- structure and functions. Advertising budget

#### **Unit IV**

Fashion sales promotional programmed for apparel marketing, communication in promotion, personal selling, point of purchase, sales promotion – objectives and methods, Marketing research – definition, scope and process – areas of research

#### **Unit V**

Pricing policies and strategies for apparel products, Importance of price policies, Functions and factors influencing pricing – internal and external, pricing strategies for new products, methods of setting prices

#### **References**

1. Marketing – *R S N Pillai and Bhagavathi, S Chand and company ltd, New Delhi, 1987*
2. Marketing management – *Dr B K Chatterjee Jaico, Juice Publishing house, Bombay 1982*
3. Marketing Principles and methods – *Philip C F and Duncon, Irwin Publications*
4. Principles of marketing – *Backman T N, Munard H H and Davidson W R, Ronald Press company, New York 1970*
5. Fashion Marketing – *Mike Easey, Black well Science Ltd, 1995*
6. Advertising – *C N Sonatakki, Klyani Publishers New Delhi, 1989*

## **Semester V Elective I – B: Business Communication**

### **Unit I**

Meaning of communication – Importance of effective communication in business – Objectives of communication - Media – Types – Principles, Process, Barriers - Methods to reduce barriers. Role of English Language in business communication - The sentence – Types – Verbs – Main and auxiliary – Agreement of verb and subject – Use of articles and prepositions – “WH” question and ‘yes’ or ‘no’ type questions - Punctuation and use of capital letters – Common errors- words often confused – Antonyms- Synonyms.

### **Unit II**

Functions of a business letter - Foreign words used in correspondence – The layout planning – Enquiries and replies – Orders and execution – Credit and status enquiries.

### **Unit III**

Complaints – Collection letters – Circular – Sales letters - Bank and insurance correspondence – Import and export correspondence - Agency correspondence – Correspondence of a company secretary.

### **Unit IV**

Memos and forms of messages – Office correspondence – Telegrams – E-mail – Fax – Interview letters – Testimonials – Appointments – Confirmation – Resignation – Report writing

### **Unit V**

Agenda and minutes of meeting – Advertisement – Speech making – Interviews- Information technology of the future - Telex - Teleconferencing - Fax-Internet – Multimedia.

### **Reference**

1. *Rajendra paul, Korlahalli.J.S.* Essentials of business communication.
2. *Krishna Mohan,* Developing communication skills.
3. *Champa Tickoo & Jaya sasikumar,* Writing with a purpose.
4. *F.T.wood,* A Remedial English Grammar for Foreign Students
5. Basic business communication – *Lesikar & Flatiley,* Jaico Publications, Chennai
6. Business communication Strategies – *Matha kutty & Monipally,* TBH Publications, Coimbatore
7. Business communication – *Locker,* Excel books, Delhi

## **Semester V Elective I – C Visual Merchandising**

### **Unit I**

Introduction :Visual merchandising-introduction, concepts and role, importance in store planning andutilizing basic visual merchandising techniques; Role of atmosphere in garment retailing – immediate effects and simulation types, visual merchandisers in garment retailing

### **Unit II**

Store Exterior And Interior: Store exterior – marquee, facade, exterior display, surrounding stores and displays; Store interior – store atmospheric, aesthetic, execution of store lay out - selection of display locations, lifts, staircase, elevators, utilization of store space; Display composition: Elements and principles of design, tools and materials

### **Unit III**

Store layout: Factors considered in organizing effective display – balance, rhythm, proportion, texture, harmony and emphasis. Store layout planning- grid, race track, freeform – direction of flow and planogram; Design elements to create mood and impression – colour, angle, motion, simplicity, and repetition

### **Unit IV**

Display: Seasonal and trend decision for point of emphasis – creativity in display; Planning of assortment, theme, ensemble, racks, shelves, bins, etc. and balance of display in a show room. Wall as retail selling tool – types of materials used merchandise display and effective wall planning. Application of colour schemes, colour psychology, creating mood by colour

### **Unit V**

Fashion Retailing: Lightings - Lights types, selection, advantages and disadvantages, music.Using effective Graphics and sinages for theme, campaign and promotional aspects - safety and security; Theme, interior and exterior displays used in garment retail outlet, boutique and haute couture, accessories show rooms, mannequins, fabric and paper displays.

### **References**

1. *Swapna Pradhan*, “Retailing Management”, 2nd Edition, Tata McGraw Hill Publishing Company Ltd, 2007
2. *Vedhamani and Gibson. G.*, “Retail Management:Functional Principles and Practices” Jaico Publishing House, 2007
3. *Bajaj Chetan, Tuli Rajesh, and Srivastava Nidhi V.*, “Retailing Management” Oxford University Press, New Delhi, 2007
4. *Lamba.A.J.*, “The Art of Retailing” Tata McGraw-Hill Companies, Inc, 2003
5. *Berman Barry and Evans Joel R.* “Retail Management: A Strategic Approach”
6. Prentice-Hill of India, 2002
7. *Uma Sekaran* , “ Organisational Behaviour
8. Industrial Psychology
9. *Aswethappa. K.* “Principles of Business Law”
10. *Bulchandani. K.R.*, “Business Law”

### **Semester VI Elective II - A - Research Methods**

#### **Unit I**

Introduction to Business Research: Research - Definition - Importance - Advantages and Limitations. The research process - problem identification and Definition -. Hypothesis Formulation; Developing Research Proposal; Ethical issues in Research.

#### **Unit II**

Research Design and Data Collection: Types of Research Design; Primary and Secondary Data, Data collection - methods - tools – Questionnaire- Questionnaire Designing and Testing; Interview Schedule ; Observation Methods; Qualitative Research; Scaling Techniques and Attitude Measurement; Online Data Sources and Research. Editing, Coding, Tabulation.

#### **Unit III**

Sampling process and selection -sample types - Sample size and sampling errors Sample Design: Defining the Universe and Sampling Unit; Sampling Frame; Probability and Non-probability Sampling Methods; Sample Size Determination, Data Collection and Survey Errors.

#### **Unit IV**

Data Analysis, Interpretation and Report Preparation: Data Editing and Coding; Tabulation; Hypothesis Testing; Analysis of Variance - Z test, T test - Chi-square test .Correlation and regression.

#### **Unit V**

Report Preparation and Presentation: Interpretation and report writing - steps in writing reports - layout of report, types, and principles of report writing - Graphical representation of results.

#### **References**

1. *Donald, R. Cooper and Parmela, S. Schindler* (2003). Business Research Methods. Tata McGraw Hill.
2. *Kothari C.R.* (2004). Research Methodology Methods and Techniques. Wishwa Prakashan.
3. *Malhotra, Naresh K.* (4th Edition, 2004). Marketing Research. Pearson Education Pvt. Ltd.
4. *Richard, I Levin* (2003). Statistics for Management. PHI, Delhi.
5. Management Research Methodology – *Krishnaswamy, K.N.*, Pearson Education, Delhi
6. Research Methodology for business – *Sekaran*, Wily Publishers, Delhi

## **Semester VI Elective II - B Industrial Engineering Techniques**

### **Unit I**

Introduction: Definition, purpose, available techniques, Aspects, physical facilities & operating facilities, scientific management, resources productivity. Work Study: Definition, objectives, Techniques, method study, work measurement, Purpose of work study, steps, different phases,

### **Unit II**

Method Study: Definition, Steps, Selection of problems, Collection of facts and consideration about objectives, Recording techniques, Elements of a process analysis, Operation process chart, Different process charts, Critical examination.

### **Unit III**

Work Measurement :Definition ,Uses, Techniques, Time Study, Measuring Instruments, Elements in time study, factors, alignment chart, Performance rating methods, observed time & normal time , allowances, Standard time, Work sampling Predetermined Motion Time study, Motion time data for assembly operations, Work factor system, method time measurement.

### **Unit IV**

Job Evaluation: definition, Aspects, Uses, different methods of job ,Ranking system, Grade description system, point method, Factor comparison method. Wage Incentive Plans: Unit of measurement, Various methods, Characteristics of wage, Incentive schemes, relationship between productivity, wages & cost. different wage incentive plans , relationship between indirect labour , direct labour & total plant productivity . Plant Maintenance: Introduction, Systems of maintenance, break down, Planned, Corrective and Preventive maintenance, maintenance schedule

### **Unit V**

Operations Research: Introduction, concept of optimization, methods of operations research, linear programming , distribution methods, Assignment models, queuing theory, Sequencing problems, Network Analysis, Game theory, Replacement analysis, depreciation.

### **References**

1. Industrial Engineering and Management by *O. P. Khanna*,
2. Textile Mill Management by *Ormerod* ,
3. Engineering Economics by *Kleinfeld*,
4. Managerial Economics by *M.V.Palyee, K.C. Sankaranarayan & J.T. Payyappilly*,
5. Essentials of Engineering Economics by *Kasner*,
6. Management in a Global Perspective by *K'oonze & Weihrich.*,
7. Quantitative Approach to Management by *Levin, Rubin, et. al.*,

## **Semester VI Elective II - C Eco Textiles**

### **Unit I**

**Introduction:** Need for eco-friendly processing. Pesticides in fibres / yarns..Heavy metals, Formaldehyde and Pentachlorophenol in textiles. **Eco Standards And Eco-Labels:** Introduction. M.S.T., OTN100, COMITEXTIL and Ecomark scheme of India. Criteria for an eco-label based on the life cycle.

### **Unit II**

**Eco-Friendly Processing:** Environmental problems associated with textile processes. Approach to eco-friendly processing – fibre origin, eco- friendly production, processing and clothing production. Study about organic cotton processing. Study about Natural dyes & Dyeing.

### **Unit III**

**Eco-Management:** Introduction. Preparation of Ecology Policy Statement. Organization. Systematic review of orders. Purchase policy. Assessment of suppliers. Testing, Calibration and Checking procedures. Documentation.

### **Unit IV**

**Eco- Audit:** introduction. product audit and production audit in textile industry. auditing parameters.**Certification and Labelling of Eco-Friendly Textiles:** introduction. Organizations. Relationship between Eco-labelling and Eco-management & Auditing schemes. Legislation and controls on packaging and packaging waste.

### **Unit V**

**Testing of Textiles to Eco-Standard Specifications:** Introduction. Test methods for testing the banned chemicals – free formaldehyde, pesticides, pentachlorophenol, heavy metals, azo dyes containing aromatic amines& benzidine and halogenic carriers.

### **References**

1. Mirafat M and Horrocks A R, “Eco Textiles”, The Textile Institute, Woodhead Publication Limited., Cambridge, 2007.
2. Susanna Benny and Janakiraman K.P.,” Eco parameters: Present Status”, Mill Control Report No.15 , The South India Textile Research Association, Coimbatore,1998.
3. The Gazette of India, Extraordinary, Part II section 3, subsection 1 No 157, Ministry of Environment and Forests, Government of India , May 4 ,1996.
4. The Gazette of India, Extraordinary, Part II section 3, subsection 11 No 193, Ministry of Environment and Forests, Government of India , May 26 ,1997.
5. Oeko-tex Standard 100, International Association for Research and Testing in the field of Textile Ecology (Oeko- tex), Zurich, Switzerland, January, 1997.

### **Semester VI Elective III - A Clothing Care**

#### **Unit I**

Finishing Equipments: Study of finishing room equipments - steam iron - steam busters - vacuum ironing tables - form finishing equipments - trouser toppler, shirt press, collar/cuff press, form finisher for jackets and coats - study of boiler and related equipment for finishing room; fusing machines for interlinings; water treatment plant -soft water -hard water - methods of softening water

#### **Unit II**

Laundry equipment and reagents: Study of laundry equipment and laundry reagents - soaps - detergents - cleaning action of soaps, indigenous cleaning agents - rita nut - shikakai - green gram - bran solution – study of modern and industrial cleaning agents

#### **Unit III**

Stiffening Agents: Study of stiffening agents –purpose of stiffening-classification of stiffening agents-preparation and uses of stiffeners- natural and commercial starches - preparation of starch for use - bleaching agents - blueing and tinting agents and their application – optical whiteners

#### **Unit IV**

Stain Removal: Principles of laundering - stain removal - various solvents for stain removing blood, tea, rust; oil/grease etc. – different methods of washing - application of friction by hand rubbing - scribing - tumble wash

#### **Unit V**

Washing Machine And Care Labels: Study of different types of house hold/industrial washing machines- rotary -swirling - pressure - tumble wash etc; the various systems of care labelling- washing instruction. bleaching instruction-drying instruction-ironing instruction-dry cleaning instruction. placement of labels on garments.

#### **References**

1. *Dantiyagi S.*, “Fundamentals of Textile and Their Care”, Oriental Longmans Ltd, New Delhi, 1996
2. *Denlkar*, “Household Textiles and Laundry Work”, Atma Ram and Sons, Delhi, 1993
3. *Neomi D’Souza*, “Fabric Care”, New Age International Publisher, 1998
4. *Davis*, “Laundry and Clothing Care”, Drama Book Publishers, 1995
5. *Mary Schenck Woolman*, “Clothing: Choice, Care, Cost” Kessinger Publishing,
6. Clothing care & Repair – *Singer*, IAFL Publications, Delhi, 2000

## **Semester VI Elective III - B Entrepreneurship and Small Business Development**

### **Unit I**

Entrepreneurship: Concept and Definitions; Entrepreneurship and Economic Development; Classification and Types of Entrepreneurs; Entrepreneurial Competencies; Factor Affecting Entrepreneurial Growth – Economic, Non-Economic Factors; EDP Programmes; Entrepreneurial Training; Traits/Qualities of an Entrepreneurs; Entrepreneur; Manager Vs. Entrepreneur.

### **Unit II**

Opportunity / Identification and Product Selection: Entrepreneurial Opportunity Search and Identification; Criteria to Select a Product; Conducting Feasibility Studies; Project Finalization; Sources of Information.

### **Unit III**

Small Enterprises and Enterprise Launching Formalities : Definition of Small Scale; Rationale; Objective; Scope; Role of SSI in Economic Development of India; SSI; Registration; NOC from Pollution Board; Machinery and Equipment Selection; Project Report Preparation; Specimen of Project Report; Project Planning and Scheduling using Networking Techniques of PERT / CPM; Methods of Project Appraisal.

### **Unit IV**

Role of Support Institutions and Management of Small Business : Director of Industries; DIC; SIDO; SIDBI; Small Industries Development Corporation (SIDC); SISI; NSIC; NISBUD; State Financial Corporation SIC; Marketing Management; Production Management; Finance Management; Human Resource Management; Export Marketing; Case Studies.

### **Unit V**

Incentives and subsidies – Subsidied services – subsidy for market. Transport – seed capital assistance – Taxation benefit to SSI role of entrepreneur in export promotion and import substitution.

### **References**

1. *Desai, Vasant* (2003). Small-Scale Industries and Entrepreneurship. Himalaya Publishing House, Delhi.
2. *Kaulgud, Aruna* (2003). Entrepreneurship Management. Vikas Publishing House, Delhi.
3. *Cynthia, L. Greene* (2004). Entrepreneurship Ideas in Action. Thomson Asia Pvt. Ltd., Singapore.
4. *Chandra, Ravi* (2003). Entrepreneurial Success: A Psychological Study. Sterling Publication Pvt. Ltd., New Delhi.
5. *Balaraju, Theduri* (2004). Entrepreneurship Development: An Analytical Study. Akansha Publishing House, Uttam Nagar, New Delhi.
6. *David, Otes* (2004). A Guide to Entrepreneurship. Jaico Books Publishing House, Delhi.
7. *Taneja* (2004). Entrepreneurship. Galgotia Publishers.

### **Semester VI Elective III - C Apparel Brand Management**

#### **Unit I**

Introduction :Brand – introduction, functions, brand significance; branding – types and strategies international apparel brands - identification of perspectives and challenges to build brand- Indian garment brands and prospects of Indian brands

#### **Unit II**

Brand Appraisal:Brand appraisal – Definition and methods - exploration, market, customer, competition analysis, reasoning of brands importance and methods involved - laddering, emotional and rational, Brand mapping – circle, prism and triangle

#### **Unit III**

Positioning: Positioning – definition, types – benefit, usage, features, users, price, value technology, tradition, perceptual map – product class and customer segment; positioning strategies – non functional values, brand loyalty and pyramid; positioning strategies of international garment retailers

#### **Unit IV**

Identity And Extension: Brand identity and articulation – name, colour, design, logo and symbols, brand service advertising and cross cultural influence; brand extension – need and types; labelling and licensing of apparel products – types, license agreement, and international property rights; need for developing brand names and labels for apparel manufactured and exported from India

#### **Unit V**

Brand Measurement: Brand measurement- definition, need and methods – audit, track, brand overtime – managing brand image - need, concepts of management, forces affecting brand and maintenance of brand, Study on brands and brand management of Indian Garment

#### **References**

1. *Parameswaran M. G.*, “Building Brand Value”, Tata McGraw Hill Publishing Company Ltd, 2006
2. *Moorthy Y. L. R.*, “Brand Management –The Indian Context” Vikas Publication Pvt Ltd, 2007
3. *Verma Harsh V.*, “Brand Management Text and Cases” Excel books, 2006
4. *Mathur U. C.*, “Brand Management Text and Cases”, Macmillan India Ltd 2006.
5. Branding – *Vanauken*, Jaico Books, Delhi
6. Branding – *Geoffrey Randall*, Wood Head Publishing, England
7. Personal Branding – *Montoya*, Jaico Books, Chennai