SEMESTER SEVENTH

MRSPTU

NON-CONVENTIONAL YARN MANUFACTURE

Subject Code: BTEXS1-701 LT P C 3 0 0 3 Duration-45 Hrs.

Course Objectives

1.To explain the new spinning processes, principle of open end spinning process and rotor spinning process.
2.To study of the working principle of air-jet spinning and electrostatic spinning process in detail.
3. To understand friction spinning and compact spinning and their working principle, yarn structure and properties.
4. To introduce about the various other non-conventional spinning systems and structure and end use of different type yarns.

Course Outcomes

At the end of the course students will be able to
1. Understand the basics of non-conventional spinning systems.
2. Explain the working principle of various non-conventional, various operations and raw material requirements.
3. Describe structure and properties of non-conventional spun yarn with respect to ring spun yarn.
4. Understand the areas of end use of non-conventional spun yarns.

UNIT-I (12 Hrs.)

Introduction: Summary of new spinning processes. Fibre Characteristics required for different, leading spinning Technologies. The basic principle of open-end spinning process.

Rotor Spinning: Introduction, Tasks of the rotor spinning machine, Principle of operation, Raw material requirements & preparation, The opening unit, Yarn formation, Rotor, Yarn withdrawal and winding. Yarn Structure and Properties, End uses.

UNIT-II (11Hrs.)

Air-jet Spinning: Principle of Vortex yarn manufacture, raw material requirements,Principle of air jet spinning
Electrostatic spinning: Passage of material through Electrostatic spinning, working principle and specifications.

UNIT-III (12Hrs.)

Friction Spinning: Principle of operation, Raw material requirements, Difference between Dref-II and Dref-III,working principle of each machine, yarn structures and properties, end uses of friction spun yarn.
Compact Spinning: Principle of compact spinning, Comparative assessment of the structure and performance with respect to ring yarn.

UNIT-IV (10 Hrs.)

Other Spinning system: Self twist, twist less, wrap spinning, Core spinning, Siro spinning, Bobtex yarn manufacture, structure of different types of yarn.

Recommended Books:

1. R. Salhotra K. and S.M. Ishtiaque, 'Rotor Spinning: Its Advantages, limitations and Prospects in India', 1stEdn.,National Information Centre for Textile and Allied Subjects, **1995**.
2. W. Klein, 'Manual of Textile Technology: New Spinning Systems', 1stEdn', The TextileInstitute, Manchester, U.K., **1993**.
3. C.A. Lawrence, 'Fundamentals of Spun Yarn Technology', 1stEdn.,CRC Press LLC, Florida,USA, **2003**.
4. R. Chattopadhyay and S.M. Ishtiaque, 'Advances in Yarn Manufacturing Process', Department of Textile Technology', IIT Delhi, **1991**.
5. Peter R Lord, Hand book of Yarn Production, Technology, Science and Economics, Woodhead publishing Ltd., Cambri England.,2003

GARMENT MANUFACTURING TECHNOLOGY

Subject Code: BTEXS1-702 LT P C 3 1 0 4 Duration-60 Hrs.

Course Objective:

1. To provide knowledge of structure of garment industry.
2. To deliver the details of technical requirements of garment manufacturing process
3. To be able to select fabrics by appropriate testing for making garments.

Course Outcome:

After completion of the course students will be able to

1. Comprehend the overall structure and status of garment manufacturing industry.
2. Understand relevant aspects of garment manufacturing process.
3. Understand the important areas of fabric properties related to garment production.
4. Know the concepts of fabric and garment comfort.

UNIT– I (15 Hrs.)

Brief outlook of garment manufacturing industry and its classification. 5 Concept of garment design and proportion.Functions of Designing Department.

UNIT – II (22 Hrs.)

Anthropometrics; garment sizing. Pattern making and grading. Principles of marker making; spreading and cutting.Cutting methods.Quality control in cutting room. Stitch classification, seam types and applications. Sewing faults, their causes and remedies. Choice of sewing needles and threads. Different types of sewing machines and their principles. Work aids- folders, presser feet, feeding systems. Outline of fusing and pressing machines.

UNIT- III (17 Hrs.)

Outline of various Apparel Production Systems and Material Handling. Quality control systems in garment manufacturing. Low stress mechanical properties of fabrics and their effect on garment production sequences. Preliminary ideas on Garment dyeing and finishing**.**

UNIT– IV (6 Hrs.)

Physiological and psychological aspects of fabric comfort. Heat and moisture relations in clothing.

Recommended Books:

1. R. Nayak& R. Padhye, 'Woodhead Publishing Limited, Cambridge, UK,**2015**.
2. G. Cooklin, 'Introduction to Garment Manufacture', Blackwell Sciences, UK, **2001**.
3. ColovicGordana, 'Management of Technology Systems in Garment Industry', WoodheadPublishing, India Ltd., New Delhi, **2011**.

4. T. Brackenbury, 'Knitted Clothing Technology', Blackwell Sciences, UK.
5. R.M. Liang & J. Webster, 'Stitches and Seams', Textile Institute, Manchester, UK, **1994**.
6. S. Das, 'Quality Characterization in Apparel', Woodhead Publishing India Ltd., New Delhi, **2009**.
7. A. Das & R. Alagirusamy, 'Science in Clothing Comfort', Woodhead Publishing India Ltd.,New Delhi, **2010**.

Apparel Merchandising and Management

Subject Code: BTEXS1-703 LT P C 3 0 0 3 Duration-45 Hrs.

Course Objective:

1. To explain merchandising: its scope, nature, importance and functions.
2. To distinguish and analyse the different functions of a merchandiser.
3. To elaborate the various aspects of planning and control
4. To explain pricing policies, product mix, product life cycle and costing of a garment.

Course outcome:

After completion of the course the students will be able to understand

1. The scope, nature, importance and functions of merchandising.
2. Exercising planning and control tools, executing planning action plan and preparation of PPM file.
3. Costing and pricing formula and strategies, fabric consumption calculation and development of costing sheet.
4. Selection and management of vendor for sourcing and various import/ export documentation.

UNIT-I (10 Hrs.)

Apparel Merchandising: Introduction to Apparel industry, buying house, liaison office, retail house, Overview of the departments, Merchandising, Merchandiser- profile, roles and responsibilities of merchandiser

UNIT-II (12Hrs.)

Sampling: Types of samples and their significance, Approvals – Pattern approvals, fabric approvals (FPT AND GPT), trims approval, sample approvals, Techpack: constituents of a techpack, reading a techpack, developing a techpack

Planning and Control in Merchandising: Importance of planning and control, Planning and control tools, merchandising calendar, Time and action plan (export merchandiser, buying merchandiser), PP meeting and PPM file

UNIT-III (12Hrs.)

Costing and Pricing Strategies: The pricing formula, Pricing strategies, Costing principles, Cut, make and trim cost [CMT cost], Fabric consumption calculation, Development of costing sheet for a garment

UNIT– IV (11 Hrs.)

Sourcing and Vendor Management: Sourcing strategies, Sourcing of raw material, Vendor selection and management, Buyer compliance, Quality inspection procedure

Introduction to Export Procedures: Import/export documentation –FOB, C&F, CIF, Certificate of origin: Letter of credit ,Bill of lading ,Export license, Packing list, Commercial invoice.

Recommended Books:

1. ROSENAU, JEREMY A. AND WILSON, DAVID L , "APPAREL MERCHANDISING: THE LINE STARTS HERE" , FAIRCHILD BOOKS
2. BHEDA R, " MANAGING PRODUCTIVITY IN THE APPAREL INDUSTRY" COMMUNICATIONS NEW DELHI
3. DORIS H KINCADE, FAY GIBSON , "MERCHANDISING OF FASHION PRODUCT" , PEARSON EDUCATION INDIA
4. **Garment Manufacturing: Processes, Practices and Technology, Prasanta Sarkar,** Online Clothing Study; 1 edition

DEPARTMENTAL ELECTIVES -I

ADVANCES IN FABRIC STRUCTURE

Subject Code: BTEXD1-711 LT P C 3 1 0 4 Duration-60 Hrs.

Course Objective:

1. To explain design, methods of manufacture and properties of backed fabrics.
2. To describe design construction, manufacture and properties of double fabrics.
3. To elaborate design, structure, method of manufacture of warp and weft pile fabrics, velveteen and tapestry fabrics.
4. To describe design, manufacture and uses of damask, brocades and spool and gripper axminster carpets.

Course outcome:

After completion of the course the students will be able to understand

1. The design, methods of manufacture and properties of backed fabrics.
2. The design construction, manufacture and properties of double fabrics.
3. The design, structure, method of manufacture of warp and weft pile fabrics, velveteen and tapestry fabrics.
4. The design, manufacture and uses of damask, brocades and spool and gripper axminster carpets.

UNIT-I (15 Hrs.)

Backed Fabric: Type of backed fabric, weaving plans, conditions of dropping and lifting stitching ends/picks, wadded backed fabrics. Gauze & Leno Weaves: Feature of these weaves, method of preparation, weaving plans, types. Extra attachments required and control of these attachments. Methods to control tension over crossing ends.

UNIT-II (15 Hrs.)

Double Fabric: Objectives of preparation, types, specialties of these types and their weaving plans (self-stitched, center stitched, interchangeable thread/fabric etc.), Principle of Dropping & Sifting of stitching ends/picks. Extra warp and Extra weft figuring: Method Of preparation, comparison of two of two methods. Control over compactness of weaves.

UNIT-III (15 Hrs.)

Warp & Weft Pile Fabrics: - Terry pile structure, method of production, extra attachments required. All-over pile structures, figuring with pile threads. Card cutting, warp pile fabrics produced on face to face principles, All- over and corded velveteen, weft plushes, figured weft pile fabrics. Tapestry structures: - Warp and weft faced tapestry, structures in single and combination.

UNIT-IV (15 Hrs.)

Damask and Compound Brocades: - Damask and its preparation. Figured warp rib andmulti-weft brocades.

Spool and Gripper Axminster carpets: - Spool axminster system: Spool setting itspresentation, loom operation, Tuft insertion. Gripper axaminster system: Selection of pile colours, Tuft insertion and general features. Spool-Gripper system.

Recommended Books:

1. Watson, 'Advance Watsons Textile Design &Colour', Butterworth Co. & Publishers Ltd,**1989**.
2. Nisbeth, 'Grammar of Textile', **1994**.
3. R. Marks and A.T.C. Robinson, 'Principles of Weaving', Textile Institute, **1976**.

TEXTURING TECHNOLOGY

Subject Code: BTEXD1-712 LT P C 3 1 0 4 Duration-60 Hrs.

Course Objectives

1.To understand the basics of texturizing.
2.To explain the principle and manufacturing method of various textured yarns.
3.To describe the structure and properties of textured yarns.
4.To demonstrate the testing of textured yarns

Course Outcomes

At the end of the course students will be able to:
1. Know the basics of texturizing.
2. Illustrate scientific principles and manufacturing methods of textured yarns.
3. Analyze structure and properties of textured yarns.
4. Evaluate scientifically the properties of textured yarns

UNIT-I (10 Hrs.)

Importance of texturing, properties of textured yarns, classification of textured yarns. Methods of texturizing.

UNIT-II (20 Hrs.)

False twist texturing machines, Pin twister type and friction twister type, Factors affecting properties of textured yarns, structure and properties of false twist textured yarns. Principle of Draw texturizing, Sequential draw texturing process and simultaneous draw texturing process. Edge crimping: Methods and machines for edge crimping.

UNIT-III (15 Hrs.)

Principle and process of Air-jet texturizing. Air jet textured effect yarns. Structure and Properties of Air-jet textured yarn. Modern developments in Air-jet texturizing. Structure and Properties of Gear crimped yarns.

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UNIT-IV (15 Hrs.)

Stuffer box Texturing, Fibre buckling, Stuffer box. Structure and Properties of Stuffer box textured yarns. Other texturing techniques. Knife edge crimping, Knit De Knit Process. Testing of textured yarns: Strength and elongation test. Degree of texturizing and stability test for textured yarns.

Recommended Books:

1. A.A. Vaidya, 'Production of Synthetic Fibres', 1st Edn., Prentice Hall of India, New Delhi, **1988**.
2. J.W.S. Hearle, L. Hollick and D.K. Wilson, 'Yarn Texturing Technology', WoodheadPublishing Ltd., UK, **2002**.
3. B.C. Goswami, J.G. Martindle and F.L. Scardino, 'Textile Yarns Technology, Structure and Applications', Wiley-Interscience Publication, New York, **1976**.
4. H.F. Mark, S.M. Atlas, E. Cernia, 'Man Made Fibre Science and Technology', 1st Edn., Vol. 1, 2, 3, Science Publishers, New York, **1967.**
5. Peter R Lord, Hand book of Yarn Production, Technology, Science and Economics, Woodhead publishing Ltd., Cambri England.,2003
6. Bernard P. Corbman, Fibre to Fabtic, Mc Graw-Hill International , 6th Edition, Singapore, 1983.

POST SPINNING OPERATIONS

Subject Code: BTEXD1-713 LT P C 3 1 0 4 Duration-60 Hrs.

Course Objectives

1.To understand the various post spinning operations and their objectives.
2.To explain about the drawing and stretching process, heat setting and texturizing process.
3.To know about various machines used for post spinning processes.
4. o Describe the influence of process conditions in structure and properties of yarn.

Course Outcomes

At the end of the course students will be able to:
1. Understand about importance and objectives of post spinning operations.
2. Explain various heat setting operations.
3. Describe the effect of process conditions in structure and properties of the yarns.
4. Decide and apply the post spinning process to manufacture desired yarn.

UNIT- I (5 Hrs.)

Post Sinning Operations: Introductions to post spinning operations, Objectives of each post spinning operation.

UNIT- II (20 Hrs.)

Drawing & Stretching: Stretching or drawing, drawing conditions, phenomenon of necking. Influences of drawing conditions on the structure and properties of fibres. Machines for stretching continuous filament yarn. Draw warping. Stretching of polyester & acrylic tow. Drawing of tow for production of staple fibre.

UNIT- III (20 Hrs.)

Heat Setting: Heat setting, objectives of heat setting. Nature of set, Mechanism of Temporary set, Mechanism of permanent set. Influence the heat setting process parameters such as time, temperature and tension. Heat setting conditions for polyester polyamide, acrylic and polypropylene. Preliminary heat setting, crimping, drying and final heat setting, cutting & packing of staple fibres.

UNIT- IV (15 Hrs.)

Texturing: Introduction to texturing. Different methods for texturing: False twist texturing, Factors influencing properties of textured yarns. Draw Texturing, Air Jet Texting, Stuffer box texturing, Knife Edge crimping, Gear Crimping, Knit-De Knit texturing process.

Recommended Books:

1. A.A. Vaidya, 'Production of Synthetic fibres', Prentice hall India Pvt. Ltd., **1988**.
2. Peter R Lord, Hand book of Yarn Production, Technology, Science and Economics, Woodhead publishing Ltd., Cambri England.,2003
3. Bernard P. Corbman, :Fibre to Fabtic, Mc Graw-Hill International , 6th Edition, Singapore, 1983.
4. Marks, Atlas, Cernia, 'Man-Made Fibre Sc.& Tech.', Vol.-I, II, III, Interscience Publishers,
5. **1976-68**.
6. Mukherjee, 'Recent Advances in Fibre Science'.

PROCESS CONTROL IN TEXTILE CHEMICAL PROCESSING

Subject: BTEXD1-721 **LT P C 3 0 0 3** **Duration-45 Hrs.**

Course objective:

1. To describe different process parameters involved and optimization of each parameter in pre-treatment of textile fabrics.
2. To explain optimized parameters for dyeing, printing of different styles and finishing of different fibers.
3. To elaborate on the effects on quality due to impure chemicals, faulty fabrics and machine handling along with methods of assessing processed products.
4. To explain the standardization of instrument/ machineries besides analysis of color for checking impurity percentage.

Course outcome:

After completion of the course the students will be able to understand

1. Different process parameters involved and optimization of each parameter in pre-treatment of textile fabrics.
2. Optimized parameters for dyeing, printing of different styles and finishing of different fibers.
3. The effects on quality due to impure chemicals, faulty fabrics and machine handling along with methods of assessing processed products.

Standardization of instrument/ machineries besides analysis of color for checking impurity percentage.

UNIT-I (10 Hrs.)

Review of different steps of chemical Processing of Textiles. Process parameters involved: - Optimized Process Parameters of each process imparted to textiles in pre-treatment viz. Singeing, desizing, scouring, bleaching, mercerization.

UNIT-II (15 Hrs.)

Optimized parameters for dyeing and printing of different fibers through various styles. Optimized finishing parameters to impart various finishes on different fibers. Process parameters/process modification/any other changes.

UNIT-III (10 Hrs.)

Change in quality due to selection of impure starting chemicals/faulty fabric/machine handling. Analysis of various chemical processing steps in terms process and quality control.
Methods to assess quality of processed product after every stage of processing and that of final product.

UNIT-IV (10 Hrs.)

Standardization of instruments/machineries, analysis of color to check impurity percentage, evaluation of chemicals to check their efficiencies.

Recommended Books

1. 'ATIRA's Process & Quality Control in Chemical Processing'.

MARKETING & FINANCIAL MANAGEMENT IN TEXTILES

Subject Code: BTEXD1-722 **LT P C 3 0 0 3** **Duration-45 Hrs.**

Course objective:

1. To explain concept, system and process of selling, marketing and market research.
2. To elaborate the concept and process of consumer and buying behavior and role of advertising and sales promotion in textile.
3. To explain ideas, objectives and functions of financial management.
4. To describe various concepts in financial management like, working capital, structure of capital and budgeting.

Course outcome:

After completion of the course the students will be able to understand

1. The concept, system and process of selling, marketing and market research.
2. The concept and process of consumer and buying behavior and role of advertising and sales promotion in textile.
3. Ideas, objectives and functions of financial management.
4. Various concepts of financial management like working capital, structure of capital and budgeting.

UNIT-I (10 Hrs.)

MARKETING MANAGEMENT: Marketing- its definition & core concepts. Marketing Management - Production concept. Product concept. Selling concept, Marketing and societal

Marketing concept. Marketing Information system. Marketing Research Process and various research designs.

UNIT-II (15 Hrs.)

Consumers behavior, factoring affecting CB, Buyer decision Process and Type of Buying Behavior. Marketing Mix: -Levels of Product, Product hierarchy, stages in New Product development, Product life cycle & its stages. Product Mix, Product time. Branding - Packaging and labeling. Price - Pricing strategies & setting the price. Place - Channels of distribution, functions & its flow. Promotion -

UNIT-III (10 Hrs.)

Mix: Advertising, sales Promotion. Personnel selling& Public relations, Factors in setting the Promotion mix with supporting examples from Textile Industry.

Financial Management: Management Accounting - Accounting concepts and financial statements. Various finance functions & financial objectives of firms. Sources of finance cost classification and cost of capital. Working capital.

UNIT-IV (10 Hrs.)

Management - Concept of Gross & Net Working Capital, classification of working capital. Factors determining the requirement of working capital. Capital Structure - Factors affecting capital structure. Capital Budgeting - its importance & methods of capital Budgeting.

Recommended Books:

1. Philip Kotler, 'Marketing Management'.
2. I.M. Pandey, Financial Management'.

ENTREPRENEURESHIP DEVELOPMENT AND MANAGEMENT IN TEXTILE

Subject Code: BTEXD1-723 LTPC 3003 Duration-45 Hrs.

Course objectives

1. To explain needs, process, benefits and support systems available for entrepreneurship development.
2. To impart knowledge about preparation of project report for establishment of a small enterprise.
3. To provide knowledge about basics of marketing, production, human resource and financial management.

Course outcomes

After completion of course, the students will be able to understand

1. needs, process, benefits and support systems available for entrepreneurship development,
2. preparation of project report for establishment of a small enterprise,
3. basics of marketing and production management,
4. preliminary ideas about human resource and financial management.

UNIT I (15 Hrs)

Entrepreneurship Development: Meaning, objectives, scope and philosophy, type of entrepreneurs, factors affecting entrepreneurship, entrepreneurial qualities, need for promotion of entrepreneurship and small business, linkage between entrepreneurship and economic development, problem of increasing unemployment, creativity and entrepreneurship, harnessing locally available resources.

Entrepreneurship Support System: SIDBI, SISIs, SSIEC, SFCs, DICs, NSIC, EDI (Ahmadabad), NRDC, NIESBUD, PSIEC and Technical Consultancy Organizations.

UNIT II (10 Hrs)

Project Report Preparation: Planning a small scale industry, identifying business opportunities, project reportand its importance, various contents of project report: managerial and entrepreneurial capabilities, socio-economic benefits, demand analysis, technical feasibility and financial viability.

UNIT III (10 Hrs)

Introduction to Marketing Management: Brief introduction to various types of product strategies, pricing strategies, channel strategies and promotional strategies.
Introduction to Production Management: Types of production systems, production planning and control, functions of production manager and materials management.

UNIT IV (10 Hrs)

Introduction to Human Resource Management: Manpower planning, recruitment, selection, placement and induction, training and development, compensation.
Introduction to Financial Management: Sources of finance and working capital management.

Recommended Books:

1. Prasanna Chandra, Projects: Planning, Analysis, Selection, Implementation and Review, Tata McGraw Hill
2. Kenneth R., Van Voorthis, Entrepreneurship and Small Business Management.
3. B. Gupta and N.P. Srinivasan, Entrepreneurial Development.
4. Gopala Krishnanand V.E Rama Moorthy, Project Management. "Macmillan India Ltd.
5. Jose Pauland Kumar AjithN,"Entrepreneurship Development and Management", Himalaya Publishers, NewDelhi(2000).
6. Dollinger," Entrepreneurship Strategies and Resources", Pearson Education (2003).
7. Holt David H, "Entrepreneurship: New Venture Creation", Prentice Hall of India (2000)
8. Kuratko and Hodgetts," Entrepreneurship Management: Theory, Process, Practice", (7th Ed), Thomson.

8th semester

MECHANICS OF TEXTILE PROCESSES

Subject Code: BTEXS1-801 LT P C 3 1 0 4 Duration-60 Hrs.

Course objectives:

1. To provide knowledge on analysis of opening, cleaning operation and blowroom performance.
2. To explain the analytic and theoretical treatments of various carding functions along with study of hook formation and degree of disorder.
3. To provide knowledge on the theoretical analyses of roller drafting together with various functions of roving frame and ring frame.
4. To explain the theoretical and mathematical treatments of shedding, picking, checking and beat- up mechanisms.

Course outcomes:

After completion of the course the students will be able to comprehend

1. Analysis of opening, cleaning operation and blowroom performance.
2. The analytic and theoretical treatments of various carding functions along with study of hook formation and degree of disorder.
3. The theoretical analyses of roller drafting together with various functions of roving frame and ring frame.
4. The theoretical and mathematical treatments of shedding, picking, checking and beat- up mechanisms.

UNIT-I (10 Hrs.)

Forces acting on fibre during opening and cleaning processes. Analysis of piano feed regulating motion. Design of Cone drums for Scutcher. Evaluation of Blow Room performance.

UNIT-II (20 Hrs.)

Mechanics of fibre entanglement and hook formation during carding.Degree of combing in carding process.Theories of carding.Forces acting in carding zone.Analysis of flat actions; opening, cleaning, accumulation of flat strip on stationary flat.Carding Index. Transfer mechanism of fibres, Doffing arc, Analysis of its significance. Analysis of stripping process.Cylinder load and transfer efficiency.Configuration and estimation of degree of disorder. Effect of different parameters on hook formation,

UNIT-III (16 Hrs.)

Fibre straightening & hook removal in roller drafting.Mechanism of package building and twisting in speed frame.Design of Cone drums for roving frame. Differential gearing in Roving frame. Balloon theory in spinning.Analysis of forces in yarn & traveler.Analysis of yarn tension during unwinding.

UNIT-IV (14 Hrs.)

Kinematics of sley and heald motion. Shed depth diagram. Shedding cam design.Mathematical treatment of picking. Friction and impactal checking with swell. Theoretical understanding of causes of pick variation by beat-up force, Bumping condition.

Recommended Books:

1. C.A. Lawrence, 'Fundamentals of Spun Yarn Technology', CRC Press, **2003**.
2. W. Klein, 'The technology of Short-Staple Spinning', Textile Institute, **1986.**

3. J.E. Booth, 'Textile Mathematics', Textile Institute, **1975**.
4. M.H. Mohamed, 'Weaving: Conversion of Yam to Fabric',Merrow Publishing Co. Ltd., **1992**.
5. R. Marks and A.T.C Robinson, 'Principles of Weaving', Textile Institute, **1976**.

MILL PLANNING AND MANAGEMENT

Subject: BTEXS1-802 **LT P C 3 0 0 3** **Duration-45 Hrs.**

Couse Objectives

1. To understand the mill planning and management, functions of management, forms and structure of business organizations.
2. To explain mill location, various aspects of factory building and plant layout.
3. To understand the air conditioning, material handling and lighting.
4. To explain basic concepts of working environment, pollution and product cost

Course Outcomes

At the end of the course students will be able to:

1. Understand basics of mill planning and management, forms and structure of business organizations.
2. To decide and explain the mill location, factory layout and various aspects of factory buildings.
3. Understand, anlyse the problems and implement the solution related to material handling, air conditioning and lighting.
4. Know the importance of working environment and pollution control and process of product cost calculation.

UNIT -I (10 Hrs.)

Introduction: Introduction to mill planning and management,
Management and Organization: Functions of management, Formsof business organizations, Mill organization.

UNIT- II (10 Hrs.)

Mill Location: Mill location and site selection, Concept, Various factors affecting plant location.
Factory Buildings: Benefit of good buildings, Shape of factory buildings, Different types of factory building for Textile Mills and their advantages and disadvantages.
Plant Layout: Objectives of good plant layout, Types of plant layout, Plant layout Procedure, Calculation for different machines required and lay-out plan for Spinning and Weaving unit.

UNIT-III (15 Hrs.)

Air Conditioning and Humidification: Air conditioning and humidification in Textile Mills, Different terms and definitions like Dry Bulb Temp, Wet bulb temp. Absolute humidity and Relative humidity, etc. Different humidification systems used in Textile Mills.
Material Handling: Introduction, Functions and Principles of material handling, Selection of material handling equipment, Material handling equipment used in textile mills.

Lighting: Lights, different basic terms related to lighting calculations, Concept of room index, concept of height and distance ratio related to lighting, calculations on lamp numbers and positioning depending on required illumination level etc.

UNIT- IV (10 Hrs.)

Working environment: Introduction, Different measures of good working environment.
Pollution: General idea about environmental pollution from textile industry, Noise pollution and its control in textile industry.
Cost: Different costs, Elements of cost, Process of Costing of a product, calculation of yarn selling price.

Recommended Books:

1. O.P. Khanna, Industrial Engineering and Management, Dhanpat Roy Publications, NewDelhi, India, **2009**.
2. P.R. Lord, Hand Book of Yarn Production, Wood Head Publishing, Cambridge, England, **2003**.
3. K. Aswathapa, K.S. Bhat, 'Production and Operation Management', Himalayan PublishingHouse, Banglore, India,**2002**.
4. D.M. Parate,, 'Noise in Loom-Shed: Analysis and Remedies', Man Made Textile in India,**1996**, No.187-189.
5. S.K. Chinta, A.I. Washif, C.D. Kane and J.R. Desai, 'Noise Pollution', Colourage, **1996**.

MRSPTU

PROJECT

Subject Code: BTEXS1-803

A comprehensive problem involving the various technologies of textile engineering should be framed. The students are required to complete their project work and submit a comprehensive report.

MRSPTU

TECHNICAL TEXTILES

Subject Code: BTEXD1-811 **LT P C 3 1 0 4** **Duration-60 Hrs.**

Course objectives:

To provide knowledge of technical textile market and trend in general and classification
To provide knowledge about the technical applications of textile like filtration, medical and protection.
To explain about the technicalapplications of textile like geotextile, automotive and other areas of applications.

Course outcomes:

At the end of the course students will be able to

Understand the technical textiles, its importance and uses.
Explain the twelve sectors of technical textiles and suitable products.
Understand various applications of technical textiles in the field like filtration, medical and protective.
Illustrate the fabric properties and requirements for military applications, geotextiles, sport, automotives.

UNIT-I (14 Hrs.)

Introduction: Definition and scope of Technical Textiles, Brief idea about technical fibres, composite materials and uses.

Filtration Textiles: Textiles as filter media. Characteristics of filter material. Basic idea of theory of filtration. Characteristics of fibres to use in different filter media. Application of woven, nonwoven and knitted fabric in filter media.

UNIT-II (16 Hrs.)

Medical Textiles: Introduction, Classification of Medical textiles, Textiles as hygienic products. Description of different Medical Textiles, Mechanisms of absorption and distribution of liquids in absorbent products like diapers.

Protective Textiles: Introduction to protective clothing, functional requirement of textiles indefense, Brief idea about ballistic protective clothing including parachute cloth, Chemical protective clothing, flame retardant fabrics. water proof breathable fabrics.

UNIT-III (14 Hrs.)

Sports Textiles: Introduction, Functional requirement of different types of products.

Automotive Textiles: Application of textiles in automobiles, requirement and design for different tyres, airbags and belts, methods of production and properties of textiles used in these applications.

UNIT-IV (16 Hrs.)

Geotextiles: Brief idea about geosynthetic. Geogrid, Geomembrane and Geocomposite. Designing and manufacture of geotextiles. Geotextiles properties and test methods. Geotextiles - functions and mechanism in separation, reinforcement, stabilization filtration & drainage.

Other uses of technical textile: Functional requirements and types of textiles used for agricultural, electronics, power transmission belting, hoses, canvas covers and tarpaulins.

Recommended Books:

1. A.R. Horrocks and S.C. Anand, 'Hand Book of Technical Textile', Woodhead Publishing Ltd,Cambridge, **2002**.
2. G.V. Rao and G.V.S. Raju, 'Engineering with Geosynthetic', Tata McGraw Hills Publication,New Delhi.,**1990**.

3. Adanaur, Sabit, 'Wellington Sears Hand book of Industrial Textiles', TechnimicPublishingcompanyPennsylavania USA., **1995**.
4. V.K. Kothari, 'Progress in Textile: Science & Technology', Vol. 3, 'Technical Textile: Technology', Developments and Applications, IAFL Publications, New Delhi, **2008**.

Advancement in Manmade Fibres

Subject Code: BTEXD1-812 **LT P C 3 1 0 4** **Duration-60 Hrs.**

Course Objectives

1.To understand structural principles of fibre forming polymers.
2.To explain the high speed melt spinning, melt spinning of hollow, multicomponent, ultrafine And nano fibres.
3.To know about spin finish application.
4.To study the technology of drawing and heat setting of synthetic fibres and simulate the melt spinning.

Course Outcomes

At the end of the course students will be able to:
1. Understand development of fibre structure man-made fibre during man-made fibre spinning.
2. Explain the high-speed melt spinning, melt spinning of hollow, multicomponent, ultrafine and nano fibres.
3. Apply spin finish on manmade fibres and textured yarns.
4. Describe the technology of drawing and heat setting of synthetic fibres and produce melt spun yarns

UNIT-I (14 Hrs.)

Structural principles of fibre forming polymers. Development of fibre structure during man-made fibre spinning. Variables in meltspinning.

UNIT-II (18 Hrs.)

High speed melt spinning: One step and two step spinning. Recent developments in melt, dry and wet technology. Various types of spinneret profiles. Mechanism of crystallization during MMF spinning.

Melt spinning of Hollow, multi component, Ultra fine and Nanofibres.

UNIT-III (12 Hrs.)

Spin finish application: Composition of spin finish, various methods of spin finish application, spin finish for staple fibre and texture dyarns.

UNIT-IV (16 Hrs.)

Technology of drawing of synthetic fibres, detailed study of mechanism of heat setting of synthetic fibres. Study of property changes in synthetic fibres during heat setting. Simulation in melt spinning for fibre production. Process control in man-made fibre spinning.

Books Recommended:

1. VaidyaAA,"ProductionofSyntheticFibres", 1stEd., PrenticeHallofIndia, New Delhi,1988.
2. GuptaV B and KothariVK, "Manufactured FibreTechnology", Chapman and Hall, London, 1999.
3."HandBook ofFibreChemistry", Ed. MLewinand E M Pearce, MercelDekkerInc., 1998.
4. HearleJ.W.S., High PerformanceFibres, Textile Institute, Woodhead Publishing, 2001
5. Mukhopadyay.S.K, "High Performance Fibres",Textile progress Vol. 25,Textile Institute Manchester, 1993.

HIGH PERFORMANCE AND SPECIALITY FIBRES

Subject Code: BTEXD1-813 **LT P C 3 1 0 4** **Duration-60 Hrs.**

Course Objectives

1. To understand the basics of polymerization, spinning of aromatic polyamides, high molecular weight polyester, rigid rod and ladder polymers.
2. To describe the manufacturing process of high performance fibres and specialty fibres.
3. To know the structure and properties of high performance fibres and specialty fibres.
4. To understand the applications of high performance fibres and specialty fibres.

Course Outcomes

At the end of the course students will be able to:
1. Understand the basics of polymerization, spinning of aromatic polyamides, high molecular weight polyester, rigid rod and ladder polymers.
2. Describe the production process of high performance fibres and specialty fibres.
3. Explain structure and properties of high performance fibres and specialty fibres.
4. Know the applications areas of high performance fibres and specialty fibres.

UNIT-I (15 Hrs.)

Polymerization, spinning and properties of aromatic polyamides, high molecular weight polyester, rigid rod and ladder polymers such as BBL, PBZT, PBO, PBI.

UNIT-II (15 Hrs.)

Manufacturing of carbon fibres from PAN precursors, viscose and pitch fibres. Glassfibres. Liquid crystal fibres. Gel spinning of polyethylene. Aramids- Introduction, polymer preparation,

Spinning, Structure and properties, applications.

UNIT-III (15 Hrs.)

Hollow and profile fibres, design of spinnerets for such fibres. Membrane technology. Blended and Bicomponent fibres. Medical textiles. Super absorbent fibres.

UNIT-IV (15 Hrs.)

Plasma modification.Radiationprocessing.Industrialtapes.Biaxially oriented films and film fibres. Barrier films and coating.

Recommended Books:

1. N.G. Mc Crum, C.P. Buckley and C.B. Bucknall, 'Principle of Polymer Engineering', OxfordUniversity Press, New York, **1990**.
2. 'High Performance Fibres'. Ed. J.W. Stteare, Woodhead Publishing Co., England, **2001**.
3. D. Hull, 'An Introduction to Composite Materials',Cambridge University Press, UK,**1981**.
4. H. Broody, 'Synthetic Fiber Materials', Longman Scientific and Technical, UK, **1994**.
5. T. Hongu, New fibres, Ellis Horwood, New York, **1990**.

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