## SEMESTER-3rd

**Total Marks =900** **Total Credits = 22**

| Subject Code | Subject | Periods | | | Credits | Ext. | Int. | Total |
|---|---|---|---|---|---|---|---|---|
| | | L | T | P | | | | |
| BTEXS1-301 | Fundamentals of Textile Machines and Processes | 3 | 0 | 0 | 3 | 60 | 40 | 100 |
| BTEXS1-302 | Textile Fiber – I | 3 | 0 | 0 | 3 | 60 | 40 | 100 |
| BTEXS1-303 | Fabric Manufacturing – I | 3 | 1 | 0 | 4 | 60 | 40 | 100 |
| BTEXS1-304 | Yarn Manufacturing – I | 3 | 1 | 0 | 4 | 60 | 40 | 100 |
| BTEXS1-305 | Kinematics of Machines | 3 | 0 | 0 | 3 | 60 | 40 | 100 |
| BTEXS1-306 | Textile Fibers Lab. –I | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| BTEXS1-307 | Fabric Manufacturing Lab. – I | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| BTEXS1-308 | Yarn Manufacturing Lab. – I | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| BTEXS1-309 | Workshop Training | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| BMNCC0-002 | Environmental Science | 1 | 0 | 0 | 0 | -- | -- | -- |
| BMNCC0-007 | Advisory Counseling | 1 | 0 | 0 | 0 | -- | -- | -- |
| | **Theory = 5 Lab = 03** | **17** | **2** | **10** | **22** | **460** | **440** | **900** |

Environmental Science: Satisfactorily/ Not Satisfactorily

## SEMESTER – 4th

**Total Marks =900** **Total Credits = 22**

| Subject Code | Subject | Periods | | | Credits | Ext. | Int. | Total |
|---|---|---|---|---|---|---|---|---|
| | | L | T | P | | | | |
| BTEXS1-401 | Textile Fiber –II | 3 | 0 | 0 | 3 | 60 | 40 | 100 |
| BTEXS1-402 | Yarn Manufacturing – II | 3 | 1 | 0 | 4 | 60 | 40 | 100 |
| BTEXS1-403 | Fabric Manufacturing –II | 3 | 1 | 0 | 4 | 60 | 40 | 100 |
| BTEXS1-404 | Textile Chemical Processing –I | 3 | 1 | 0 | 4 | 60 | 40 | 100 |
| BTEXS1-405 | Fabric Structure Analysis | 3 | 0 | 0 | 3 | 60 | 40 | 100 |
| BTEXS1-406 | Yarn Manufacturing Lab.-II | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| BTEXS1-407 | Fabric Manufacturing Lab.-II | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| BTEXS1-408 | Textile Chemical Processing Lab.–I | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| BTEXS1-409 | Fabric Structure Analysis Lab | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| BMNCC0-007 | Advisory Counseling | 1 | 0 | 0 | 0 | -- | -- | -- |
| | **Theory 05 Lab 04** | **16** | **03** | **08** | **22** | **460** | **440** | **900** |

## SEMESTER-5th

**Total Marks =900** **Total Credits = 23**

| Subject Code | Subject | Periods | | | Credits | Ext. | Int. | Total |
|---|---|---|---|---|---|---|---|---|
| | | L | T | P | | | | |
| BTEXS1-501 | Properties of Fiber | 3 | 1 | 0 | 4 | 60 | 40 | 100 |
| BTEXS1-502 | Fabric Manufacturing- III | 3 | 0 | 0 | 3 | 60 | 40 | 100 |
| BTEXS1-503 | Non Woven Technology | 3 | 0 | 0 | 3 | 60 | 40 | 100 |
| BTEXS1-504 | Textile Testing-I | 3 | 1 | 0 | 4 | 60 | 40 | 100 |
| BTEXS1-505 | Textile Chemical Processing –II | 3 | 1 | 0 | 4 | 60 | 40 | 100 |
| BTEXS1-506 | Textile Testing Lab.-I | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| BTEXS1-507 | Textile Chemical Processing Lab.–II | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| BTEXS1-508 | Fabric Manufacture Lab – III. | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| BTEXS1-509 | Training-II | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| BMNCC0-007 | Advisory Counselling | 1 | 0 | 0 | 0 | -- | -- | -- |
| **Total** | **Theory 05 Lab 03** | **16** | **3** | **10** | **23** | **460** | **440** | **900** |

## SEMESTER-6th

**Total Marks =700** **Total Credits = 22**

| Subject Code | Subject | Periods | | | Credits | Ext | Int | Total |
|---|---|---|---|---|---|---|---|---|
| | | L | T | P | | | | |
| BTEXS1-601 | Theory of Textile Structure | 3 | 1 | 0 | 4 | 60 | 40 | 100 |
| BTEXS1-602 | Process Control in Textiles | 3 | 1 | 0 | 4 | 60 | 40 | 100 |
| BTEXS1-603 | Knitting Technology | 3 | 1 | 0 | 4 | 60 | 40 | 100 |
| BTEXS1-604 | Textile Testing-II | 3 | 1 | 0 | 4 | 60 | 40 | 100 |
| BTEXS1-605 | Quality Management in Textile Industry | 3 | 1 | 0 | 4 | 60 | 40 | 100 |
| BTEXS1-606 | Knitting Technology Lab. | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| BTEXS1-607 | Textile Testing Lab.-II | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| BMNCC0-007 | Advisory Counseling | 1 | 0 | 0 | 0 | -- | -- | -- |
| | **Theory 05 Lab 02** | **16** | **05** | **04** | **22** | **380** | **320** | **700** |

## SEMESTER 7th

**Total Marks =700** **Total Credits = 20**

| Subject Code | Subject | Periods | | | Credits | Ext. | Int. | Total |
|---|---|---|---|---|---|---|---|---|
| | | L | T | P | | | | |
| BTEXS1-701 | Non Conventional Yarn Manufacture | 3 | 0 | 0 | 3 | 60 | 40 | 100 |
| BTEXS1-702 | Garment Manufacturing Technology | 3 | 1 | 0 | 4 | 60 | 40 | 100 |
| BTEXS1-703 | Apparel Merchandising and Management | 3 | 0 | 0 | 3 | 60 | 40 | 100 |
| BTEXS1-704 | Training - III | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| BTEXS1-705 | Seminar | 0 | 0 | 2 | 1 | 40 | 60 | 100 |
| **Departmental Elective – I** | **(Select any one)** | 3 | 1 | 0 | 4 | 60 | 40 | 100 |
| BTEXDI-711 | Advances in Fabric Structure | | | | | | | |
| BTEXDI-712 | Texturing Technology | | | | | | | |
| BTEXDI-713 | Post Spinning Operation | | | | | | | |
| **Departmental Elective – II** | **(Select any one)** | 3 | 0 | 0 | 3 | 60 | 40 | 100 |
| BTEXDI-721 | Process Control in Textile Chemical Processing | | | | | | | |
| BTEXDI-722 | Marketing & Financial Management in Textiles | | | | | | | |
| BTEXD1-723 | Entrepreneurship development and management in Textile | | | | | | | |
| BMNCC0-007 | Advisory Counseling | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | **Theory 05 Lab 0** | **16** | **02** | **06** | **20** | **380** | **320** | **700** |

## SEMSETER- 8th

**Total Marks = 500** **Total Credits = 17**

| Subject Code | Subject | Periods | | | Credits | Ext. | Int. | Total |
|---|---|---|---|---|---|---|---|---|
| | | L | T | P | | | | |
| BTEXS1-801 | Mechanics of Textile Process | 3 | 1 | 0 | 4 | 60 | 40 | 100 |
| BTEXS1-802 | Mill Planning & Management | 3 | 0 | 0 | 3 | 60 | 40 | 100 |
| **Departmental Elective – I** | **(Select any one)** | 3 | 1 | 0 | 4 | 60 | 40 | 100 |
| BTEXD1-811 | Technical Textiles | | | | | | | |
| BTEXD1-812 | Advancement in Manmade Fibers | | | | | | | |
| BTEXD1-813 | High Performance & Specialty Fibers | | | | | | | |
| **xxxx** | **Open Elective** | 3 | 0 | 0 | 3 | 60 | 40 | 100 |
| BTEXS1-803 | Project | 0 | 0 | 6 | 3 | 40 | 60 | 100 |
| BMNCC0-007 | Advisory Counseling | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | **Theory 04 Lab 0 P01** | **13** | **02** | **06** | **17** | **280** | **220** | **500** |

**Total Credits = 22+22+23+22+20+17= 126**

## FUNDAMENTALS OF TEXTILE MACHINE AND PROCESSES

**Subject Code: BTEXS1- 301** **LT P C 3 0 0 3** **Duration: 45 Hrs.**

### UNIT– I (12 Hrs.)

Basic characteristics of textile materials; Classification of fibres. Basic requirements of fibre forming polymers.Elementary idea of polymerization.Concept of dimensional characteristics of textiles; (eg.Fiber and Yarn Numbering systems, fabric thickness etc.) Applications of textiles in diversified fields, Variations in textile structure and properties based on applications.

### UNIT – II (12 Hrs.)

Role of different structure and material constituents for fulfillment of target requirements; Different machine sequences for processing textile materials differing in structure Introduction to the language of textile and process flow of fibers up to finished product.

### UNIT – III (11 Hrs.)

Elementary idea about the objectives and working of each machine used in yarn manufacturing. Woven knitted and nonwoven fabric production. Basic idea of nonconventional spinning & weaving machineries.

### UNIT – IV (10 Hrs.)

Elementary idea of desizing, scouring, bleaching, dyeing, printing & finishing processes. Different end uses of finished products.

**Recommended Books:**

1. V.A. Senhai, 'Textile Fibre', vol-1, Sevak Publishers, Bombay, **1995.**
2. W. Klein, 'Manual of Textile Technology' Textile Institute, Manchester, **1995.**
3. T.K. Pattabhiram, 'Essential Elements of Textile Calculations' 2nd Edn.,Textile Trade Press,Ahmedabad.
4. E.P.G. Gohl&Vilensky L.D., 'Textile Science', 1st Indian Edn.,CBS Publishers, **1987.**
5. Rose Sinclair,'Textiles and Fashion: Materials, Design and Technology', WoodheadPublishing Series in Textile, No. 126.
6. W.E. Morton and J.W.S. Hearle, 'Physical Properties of Textile Fibres', WoodheadPublishing Series in Textiles No. 68, 2008, UK.

## TEXTILE FIBRE –I

**Subject Code: BTEXS1- 302** **LT P C 3 0 0 3** **Duration : 45 Hrs.**

### UNIT -I (10 Hrs.)

**Introduction**: Fibre, Textile fibre, Staple fibre, Filament fibre, Natural fibres, Manmade fibres,regenerated and Synthetic Fibres, Classification of textile fibers.

### UNIT- II (11 Hrs.)

**Properties of Fibres and Polymers**: Essential and desirable properties of textile fibers, Essential properties of fibre forming polymers. Correlation of structures with properties of fibres, Crystallinity and Orientation in fibres.

### UNIT-III (10 Hrs.)

**Production Properties and Uses of Major Natural Fibres**: Production, Physical & Chemicalproperties and uses of Major natural Fibres (e.g. cotton, flax, jute, wool, silk).

**UNIT-IV (14 Hrs.)**

**Man Made Fibres**: Introduction to manmade fibres. Basic production systems for the manmadefibre i.e. melt, wet and dry spinning systems. Production, Properties and uses of regenerated fibres (e.g. viscose, Cuprammonium, polynomic, HWM & acetate rayons).

**Recommended Books:**

1. M. Lewin, 'Hand Book of Fibre Chemistry', 3rd Edn, CRC Press Tylor & Francis Group, **2007**.
2. B.P. Corbman, Textile Fibre to Fabric, 6th Edn, McGraw Hill Singapore, **1983**.
3. R.R., Wardman, R.H., The Chemistry of Textile Fibres, Royal Society of Chemistry (RSC)Publishing, Cambridge, U.K,**2011**.
4. R.M. Kozlowsky, 'Hand Book of Natural Fibres', Vol.-I, Wood Head Publishing,Cambridge, U.K,**2012.**
5. E.P.G. Gohl, L.D. Vilensky, 'Textile Science', CBS Publishers, New Delhi, India, **1987**.
6. V.A. Shenai., 'Technology of Textile Processing: Textile Fibres', Vol.-I, SewakPublications, Mumbai, India,**1995**.

## FABRIC MANUFACTURE-I

**Subject Code: BTEXS1- 303 LT P C 3 1 0 4 Duration: 60 Hrs.**

**UNIT-I (16 Hrs.)**

**WINDING**: Objectives, basic features of slub catchers and yarn clearers like Mechanical andelectronics types. Yarn tensioners: Additive, Multiplicative & Combined. Anti-patterning: Reasons and Remedies. Classification and basic features of auto winders, Yarn doubling systems, Splicing and knotting Yarn fault classifying systems.
CALCULATIONS ON: Production and efficiency related to winding and Machine Balancing in winding

**UNIT-II (16 Hrs.)**

**WARPING**: Comparison of various types of warping such as: Beam warping &Sectional warping. Basic features, Creels, Reeds, leasing systems and drawing systems
**SIZING:** Objectives & classification of sizing methods, features of sizing machine, machine elements, sizing ingredients, size preparation. Principles of different modern sizing techniques and their uses.
CALCULATIONS ON: Production and efficiency related to warping & sizing and Machine Balancing in warping & sizing

**UNIT-III (14 Hrs.)**

**PIRN WINDING**: Objective, different types of pirns, yarn traversing system, automation, standard winding parameters.
CALCULATIONS ON: Production and efficiency related to pirn winding and Machine Balancing in pirn winding

**UNIT-IV (14 Hrs.)**

**WEAVING:** Manual, automation, General loom classifications, and Overall concept of looms. Concepts of primary, secondary & auxiliary motions of looms
CALCULATIONS ON: Production and efficiency related to weaving and Machine Balancing in weaving

**Recommended Books**

1. J.E Booth, 'Textile Mathematics', CBS Publishers N. Delhi, **1995.**
2. N.N. Bannerjee, 'Weaving Mechanism', Textile Book House, Berhampore, WB.,**1993**.
3. M.K. Talukdar, 'Winding', Spinnet View, **1992**.
4. A. Sengupta, 'Weaving Calculations', DBT & SONS Pvt. Ltd., Mumbai.,**1996**.
5. R. Marks & Robinson A.T.C. 'Principles of Weaving', Textile Institute, Manchester, **1976**.

## YARN MANUFACTURING - I

**Subject Code: BTEXS1- 304 LT P C 3 1 0 4 Duration: 60 Hrs.**

### UNIT-I (14 Hrs.)

Introduction to short and long staple spinning

**Ginning:** Objectives of ginning, differential ginning, Roller, Saw and McCarthy ginning machines. **:** Objectives of mixing and blending, Different methods of mixing and blending, Study of modern blending machines, Auto mixer.

### UNIT-II (18 Hrs.)

**Blow Room** Principle of opening and cleaning objects of Blow room line. Various type of opener and cleaner their construction and working, its modern development. Study of Lap forming mechanism, Calendar roller pressure, Length measuring mechanism, feed regulating system. Single line processing, Selection of machinery for different types of cotton fibre, Different types of Lap defects and their remedies, Degree of opening, Norms, Recent development in Blow room, Calculation pertaining to blow room. Selection of Blow Room line for different types of cotton fibre.

### UNIT-III (14 Hrs.)

**Carding:** Objectives of carding.Introduction to roller and clearer card.Principle of carding.Detailed study of revolving flat card.Construction, feature and working details of licker-in cylinder, doffer and flats. Card clothing; metallic & flexible, carding angle, card setting, Neps in card, Fibre hooks, Fibre transfer. Features of high production card.Defects in card web & their remedies.Autoleveller. Calculation pertaining to production, draft etc. of carding m/c.Recent development in Card.

### UNIT-IV (14 Hrs.)

**Draw Frame:** Objectives of drawing, principles of roller drafting. Detailed study of draw framemachine. Roller & Rollers settings, Roller weighting, Roller clearer, Mechanics of roller slip, roller eccentricity, roller vibration. Conventional drafting system, Shirley draft distribution. Drafting wave, Different drafting system, Features of Modern draw frame, auto leveler in draw frame. Calculation pertaining to draft and production of draw frame machine.

**Recommended Books:**

1. W. Klein, 'Opening and Carding', Textile Institute Manchester, **1987**.
2. W. Klein, 'Short Staple Spinning Series', Textile Institute Manchester, **1987**.
3. K.R. and R. Chattopadhyay, 'Blow Room and Card NCUTE, IIT Delhi, **1998**.
4. Venkatsubramanian, 'Spun Yarn Technology', Vol.-I, & II, Mub. Sevak Pub.
5. T.K. Pattabhiram, 'Cotton Spinning, Somaiya Publication Pvt. Limited, New Delhi, 4th Edn.,**1997**.
6. Gilbert R. Merill, 'Cotton Blow Room and Carding', Gilbert R Publication, Lowell, No.1955.
7. J.E. Booth, 'Textile Mathematics', Vol –I, Textile Institute Manchester,**1975**.

8. J.E. Booth, 'Textile Mathematics', Vol –II, Textile Institute Manchester, **1975**.
9. Gilbert R. Merill, 'Opening and Carding', Gilbert R. Publication, Lowell, Mass, **1960**.
10. Taggart William, 'Cotton Spinning', Universal Book Corporation, Mumbai.

## KINEMATICS OF TEXTILE MACHINES

**Subject Code: BTEXS1- 305 LT P C 3 0 0 3 Duration: 45 Hrs.**

### UNIT – I (12 Hrs)

**Kinematics of motion:** Introduction, Plain, Rectilinear and Curvilinear motion, Equations of linear motion with graphical representation, Equations of angular motion, Relation between linear and angular quantities of motion

**Simple Mechanisms:** Introduction, Kinematic link or Element, Types of links, Structure, Kinematic pair, Types of constrained motions, Classification of kinematic pairs, Kinematic Chain, Types of Kinematic chains

### UNIT – II (12 Hrs)

**Gear and Gear Trains:** Introduction, Nomenclature of gears, Classification of gears, Gears in textile machines, Types of gear trains, simple gear train, compound gear train, Reverted gear train, epicyclic gear train, Velocity ratio of epicyclic gear train, compound epicyclic gear train, epicyclic gear train with bevel gears, epicyclic gear train in textile testing, epicyclic gear train as transmission gear, epicyclic gear train in loom let off motion, epicyclic gear train as differentials.

### UNIT – III (10 Hrs)

**Brakes:** Introduction, Materials for brake lining, Types of brakes, Single block or shoe brake, Pivoted block or shoe brake, Double block or shoe brake, Simple band brake, differential band brake, Band and block brake, Internal expanding brake

### Unit IV (11 Hrs)

**Belt, Rope and Chain drives:** Introduction, selection of belt drive, Types of belt drives, Types of belts, Flat belt drives, Velocity ratio of belt drive, Power transmitted by a belt, Ratio of driving tension for flat belt drive, Centrifugal tension, Initial tension in a belt, V-belt drive, Rope drive and Chain drives

**Recommended Books:**

1. N. Gokarnashan, 'Mechanics and Calculation of Textile Machinery', Woodhead PublishingIndia, Delhi,**2015.**
2. G. Nagarajan, 'Textile Mechanisms in Spinning and Weaving machines', WoodheadPublishing India, Delhi, **2015.**
3. R.S Khurmi, Theory of machines
4. J.E. Booth, 'Textile Mathematics', Volumes – 2 & 3, Textile Institute, Manchester.

## TEXTILE FIBRES LAB.-I

**Subject Code: BTEXS1- 306 LT P C 0 0 2 1 Duration: 20 Hrs.**

At least 10 experiments are to be performed by each student

**Physical and Chemical Identification of following Textile Fiber (s)**

1. Identification of cotton
2. Identification of wool
3. Identification of silk
4. Identification of Bastfibres
5. Identification of polyester
6. Identification of nylon
7. Identification of Acrylic
8. Identification of Polypropylene
9. Identification of fibres in blend and % fibre content in blend
10. Analysis of P/C blended fabric
11. Analysis of P/V blended fabric
12. Analysis of P/W blended fabric
13. Estimation of fibre/filament fineness using projection microscope.
14. Determination of moisture regain and content in cotton fibres.
15. Determination of fibre maturity percentage in cotton fibres.

## FABRIC MANUFACTURE LAB.-I

**Subject Code: BTEXS1-307 L T P C 0 0 2 1 Duration: 20 Hrs.**

At least 10 experiments are to be performed by each student

1. Study of the motion transmission system in winding machine.
2. Study of the effect of slub catcher, yarn tensioner & yarn guide on package formation.
3. Study of Package stop motion in cone winding machine.
4. Calculation of winding speed on grooved drum winding system and study of anti-patterning system incorporated to it.
5. Study of precision winding machine and mechanism of package building.
6. Study of the motion transmission system in Pirn winding machine.
7. Calculation of winding speed and traversing speed of Pirn winding machine.
8. Study of the sectional warping machine & plan the width of a section according to the given striped fabric keeping in view the pattern.
9. To study the passage of yarn on a sizing machine and the features of various parts/mechanism of the sizing machine.
10. Study of primary motions of a loom

## YARN MANUFACTURE LAB.-I

**Subject Code: BTEXS1-308 LT P C 0 0 2 1 Duration: 20 Hrs.**

At least 10 experiments are to be performed by each student

1. Study of general outline of opener & clearer machine employed in B/R line process.
2. Study of following in Shirley Trash Analyzer machine.
   A) Chief organs.
   B) Gearing arrangements.
   C) Speed of different beater.
   D) Teeth inclination & Teeth per inch.
3. Determination of trash content and analysis of waste by using trash analyzer machine.
4. Study of carding machine with technical details.
5. Study of gearing mechanism calculation of the speed of different organs of carding machine.
6. Calculation of draft between different zone & production of carding machine.
7. Study of card settings for different fibre lengths & types.
8. Maintenance and overhauling of carding machine.
9. Study of distribution of fibrous waste in a carding machine.
10. Study of the `Nep -COUNT' in a card.
11. Study of drafting arrangement & top roller weighting system of Draw Frame machine.
12. Calculation of the total draft and its distribution in draw frame machine
13. Effects of break draft and roller settings on sliver uniformity.
14. Measurement of nip-load pressure, roller eccentricity & shore hardness of top roller drafting rollers.
15. Maintenance and overhauling of draw frame machine.

## TEXTILE FIBRE-II

**Subject Code: BTEXS1-401 LT P C 3 0 0 3 Duration: 45 Hr**

### Unit-I (10 Hrs.)

**Introduction:** Introduction to man-made fibres, Idea about fine structure of man-made fibres. **Crystallinity, orientation:** Detailed study of crystallinity, orientation and its effects on fibreproperties.

### Unit-II (14 Hrs.)

**Melt Spinning:** Melt Spinning with special reference to Polyester & Nylon. Melting of polymerchips, extrusion, spinning, drawing, heat setting & cutting of melt spun filaments/fibre.
**Wet and Dry Spinning**: Wet and dry spinning with special reference to acrylic. Relative merits & demerits of the wet & dry spinning systems. Preparation of polymer solution, extrusion, spinning, filament formation drawing, heat setting, cutting of wet & dry spun filaments/fibre.

### Unit-III (10 Hrs.)

**Heat Setting**: Introduction about heat setting.Important parameters of heat setting & their effectonfibre properties.
**Drawing and Stretching**: Introduction about drawing. Drawing condition, phenomenon ofnecking, Machines for stretching continuous, filament yarns, Drawing, heat setting, crimping of staple fibres.

**Unit-IV (11 Hrs.)**

**Production Properties and Uses of Synthetic Fibres**: Detail study of the production, physical,chemical structures & Properties of polyester, nylon 6 & 66, **Polypropylene**, acrylic, elementary idea about high speed spinning.

**High Performance Fibres**: Introduction to high performance fibres, Elementary idea aboutaramid, carbon & glass fibres.

**Recommended Books:**

1. R.R. Matter, R.H. Wardman, 'The Chemistry of Textile Fibres', Royal Society of Chemistry(RSC) Publishing, Cambridge, U.K, **2011**.
2. M. Lewin, 'Hand Book of Fibre Chemistry', 3rd Edn, CRC Press Tylor & Francis Group, **2007**.
3. V.K Kothari., 'Progress in Science and Technology, Textile Fibres- Development and Innovation', Volume-2, IAFL Publication, New Delhi, India, **2000**.
4. B.P. Corbman, 'Textile Fibre to Fabric', 6th Edn, McGraw Hill Singapore, **1983**.
5. B.L. Deopura, B. Gupta, Manmade Fibres, NCUTE-Pilot Programme, Dept. of TextileTechnology, IIT, Delhi, **1999**.
6. E.P.G. Gohl, L.D. Vilensky, 'Textile Science', CBS Publishers, New Delhi, India, **1987**.
7. S.P. Mishra, 'Science and Technology of Manmade fibres', Suraj Publication, **2007**.
8. V.A. Shenai, Technology of Textile Processing: Textile Fibres, Volume-I, SewakPublications, Mumbai, India, 1**991**.
9. A.A. Vaidya, 'Production of Synthetic fibres', Prentice Hall of India Pvt. Ltd. Publisher, **1988**.

## YARN MANUFACTURE – II

**Subject Code: BTEXS1-402 LT P C 3 1 0 4 Duration: 60 Hrs.**

**UNIT-1 (14 Hrs.)**

Brief idea about short staple spinning technology.

**Combing Process**: Objectives, combing for shorter and medium varieties of cotton, cottons suitable for combing, preparation of stock for combing, combing cycle, role of machine components and settings, noil extraction at backward feed and forward feed comber, norms and assessment and production calculations. Recent developments,

**UNIT-II (14 Hrs.)**

**Roving Process:** Process related to roving formation: Objectives, functions of different machine components and high drafting system, roving twist in speed frame, winding principles and equations related to bobbin leading and flyer leading, building motion, production calculations, norms, and performance assessment. Developments in speed frame.

**UNIT-III (16 Hrs.)**

**Ring Spinning Process**: Function and mode of operation of ring frame, role of drafting system,yarn guiding devices, forces acting between ring and traveler, yarn tension variation, angle of yarn pull, tasks of traveler, limiting speed, classification, form of traveler, traveler mass and material, different ring-traveler combinations, fiber lubrication, running on new-ring, winding process, cop building, cylinder and conical tip, spinning geometry, causes of end breaks, production calculations, norms, performance assessment. Latest developments including compact spinning.

**UNIT-IV (16 Hrs.)**

**Non-Conventional Spinning Processes:** Brief idea about principle of open end spinning, rotorspinning, chief organs and their functions, yarn properties in comparison with ring-spun yarn, principle of friction spinning, function of chief organs, yarn properties, basic principle to air jet spun yarn, functions of chief organs, yarn properties.

**Recommended Books:**

1. W. Klein, 'Manual of Textile Technology', vol.1 to 5', The Textile Institute Manchester, **1995**.
2. A.R. Khare, 'Elements of Combing', Sai Book Center, Mumbai, **1999**.
3. A.R. Khare, 'Elements of Ring Frame and Doubling', Sai Book Centre, Mumbai, **1999**.
4. K.R. Salhotra, 'Spinning of Man Made and Its Blends in Cotton System', The TextileAssociation of India, Mumbai, **1989**.
5. R. Chattopadhyay and R. Rengasamay, 'Spinning: Drawing, Combing and Roving', NCUTE, IIT, Delhi, **1999**.
6. Merill, R Gilbert, Roving, Gilbert R Publication, Lowell, Mass, **1956**.
7. W. Klein, 'Practical Guide to Ring Spinning', Vol. -4, Textile Institute, Manchester, **1987**.
8. W. Klein, 'Short Staple Spinning Series', Textile Institute, Manchester, **1987**.
9. P.R. Lord, 'Roller Drafting', Textile Progress 23 vol. 4, Textile Institute, Manchester, **1993**.
10. Taggart William, 'Cotton Spinning', Universal Book Corporation, Mumbai.
11. K.R. Salhotra, R. Alagiruswamy, R. Chattopadhyay, 'Ring Spinning, Doubling and Twisting', NCUTE, IIT Delhi, **2000**.
12. K.R. Salhotra and B. Dutta, 'Seminar on Rotor Spinning', IIT Delhi, **1981**.
13. J.E. Booth, 'Textile Mathematics', Vol. –II, Textile Institute Manchester, **1975**.
14. Taggart William, 'Cotton Spinning', Universal Book Corporation, Mumbai.

## FABRIC MANUFACTURE - II

**Subject Code: BTEXS1-403** **LT PC 3 1 0 4** **Duration: 60 Hrs.**

**UNIT-I (16 Hrs)**

**BASIC MOTIONS:** Different types with advantages and disadvantages,
Tappet shedding: Mechanisms & principles. Positive & negative shedding, Heald reversing motions, Types of picking such as: under picking, over picking and parallel picking. Calculation of Picking force & shuttle velocity, Different picking accessories and its function, Reasons of false picking & shuttle fly.

**UNIT-II (14 Hrs)**

Movement of sley, Beat-up &sley eccentricity, Calculation related to sley eccentricity & its effects. Reed and reed counting systems,

**UNIT-III (15 Hrs)**

**LET OFF:** Different types of let-off systems, long term, short term and medium term variations.Relation between beam diameter and tension of warp. Principles of modern positive Let-off systems as such as Sulzer, Hunt, etc.

**TAKE-UP:** Types of take-up, examples of each: Periodicity in Take - up, Modern continuous take up like Sulzer, Saurer etc.

**UNIT-IV (15 Hrs)**

**WARP STOP:** Types of warp stop motions with examples such as Mechanical & Electrical stop motion.
**WARP PROTECTOR:** Study of Loose reed and fast reed warp protector motion.
**WEFT STOP:** Functions of Weft feelers and its different types.

**Recommended Books:**

1. R. Marks and A.T.C. Robinson, 'Principles of Weaving', Textile Institute, **1976**.
2. Prabir Kumar Banerjee, 'Principles of Fabric Formation', CRC Press, **2015.**
3. P.R. Lord & M.H. Mohamod, 'Weaving: Conversion of Yam to Fabric',MerrowPublishingCo. Ltd., **1992**.
4. V. Valeriy, Choogin, 'Mechanisms of Flat Weaving Technology, Woodhead Publishing, **2013.**
5. Sabit, Adanur, 'Handbook of Weaving', Technomic Publications, **2001**.

## TEXTILE CHEMICAL PROCESSING – I

**Subject Code: BTEXS1-404 LT P C 3 1 0 4 Duration: 60 Hrs.**

**UNIT-I (15 Hrs.)**

**Introduction**: Process line for pretreatment, colouration and finishing of textiles
**Singeing**: Object of the process, types of singeing, details of various singeing methods,drawbacks and advantages. Process and quality control aspects involved.
**Desizing**: Object, types, method details and mechanism of removal of starch in various methods. Efficiency of desizing.
**Scouring**: Objectives, mechanism of removal of impurities, recipe and controlling parametersinvolved. Scouring of colouredtextiles.Scouring of natural, manmade and blended textiles.Evaluation of scouring efficiency.

**UNIT-II (15 Hrs.)**

**Bleaching:** Objectives of bleaching.Hypochlorite, peroxide, chlorite and per-acetic acidbleaching methods and their effectiveness on various textiles. Controlling parameters and mechanism involved in each method. Efficiency of bleaching.
**Mercerization**: Objectives, mechanism related to various physical and chemical changes incotton during mercerization. Process parameters and operation details.Causticization.Wet and hot mercerization.Ammonia treatment of cotton. Performance of various mercerization /alkali treatment processes. Assessment of efficiency of mercerization: Barium activity number, its determination and interpretation.
**Pretreatment Machineries**: Singeing m/c, J-box, kier, mercerizing machine,

**UNIT-III (15 Hrs.)**

**Heat Setting**: Objectives and mechanism of setting. Different methods of heat setting and theireffectiveness on various man made textiles and blends. Heat setting conditions and controls. Heat setting of polyester, nylon, acetate and their blends.Evaluation of degree of heat setting.

**Mechanical Finishes:** Physical and chemical softening processes, selection of chemical andevaluation of softening. Calendaring - its types, construction and function of various calendaring m/cs. Sanforizing - method, mechanism and machineries involved. Evaluation of sanforizing.

**UNIT-IV (15 Hrs.)**

**Carbonization:** Objectives, selection of chemical, process details, trouble shoots, precautionarymeasures and efficiency of carbonization.

**Functional Finishes**: Problem of creasing, anti-crease finish on cotton. Choice of chemical,catalyst and process parameters. Drawback and advantages associated with use of various anti-crease chemicals. Measures to reduce release of formaldehyde.Water repellency and water repellent finishes on cotton.Evaluation of water repellency.

**Recommended Books:**

1. A.K. Roy Choudhary, 'Textile Preparation & Dyeing', Science Publishers, USA,**2006**.
2. R.H. Peters 'Textile Chemistry', Vol - II, Elsevier Publishing Company, London, **1967**.
3. R.M. Mittal and S.S. Trivedi, 'Chemical Processing of Polyester / Cellulosic Blends', Ahmedabad Textile Industries Research Association, Ahmedabad, India,**1983**.
4. S.R. Karmakar, 'Chemical Technology in the Pretreatment Processes of Textiles', TextileScience & Technology Series, Vol-12, 1st Edn, Elsevier, **1999**.
5. A.J. Hall, 'Textile Finishing', Haywood Books, London, **1996**.
6. V.A. Shenai, 'Technology of Bleaching & Mercerization'.
7. A.A. Vaidya, 'Textiles Auxiliaries & Finishing Chemicals'.
8. V.A. Shenai and N.M. Saraf, 'Technology of Textile Finishing', Sevak Publications, Mumbai, **1990**.

## FABRIC STRUCTURE & ANALYSIS

**Subject Code: BTEXS1-405** **LT P C 3 0 0 3** **Duration: 45 Hrs.**

**UNIT-I (12 Hrs.)**

**Formation of Fabric.**Fabric cover and crimp. Detection of directions of warp and weft. Weaving plan. Methods of its preparation.

**UNIT-II (12 Hrs.)**

Detailed study of various weaves for their reproduction: Plain weave & its derivatives, Twill weave & its derivatives. Satin/sateen weave & its derivatives. Diamond and diaper, Honeycomb, Huck-a-back, Mock leno.

**UNIT-III (10 Hrs.)**

Welt/pique, Bedford cord, crepe weaves. Stripe & check effects. Its types.Different methods to produce these weaves. Color and weave effect.

**UNIT-IV (11 Hrs.)**

Terry weaves Backed fabric, Doubled fabric. Technical specification of important weaves. Calculation relating to raw material required to produce different weaves.

**Recommended Books**

1. Watsons, 'Textile Design & Color', 7th Edn.,Butterworth& Co. Ltd., London, **1988**.
2. Watsons, 'Advanced Textile Design', 7th Edn.,Butterworth& Co. Ltd., London,**1989**.
3. Nisbet, 'Grammar of Textile Design', **1994**.

## YARN MANUFACTURE LAB.-II

**Subject Code: BTEXS1-406** **LT P C 0 0 2 1** **Duration: 20 Hrs.**

At least 10 experiments are to be performed by each student.

1. To study the timing diagram of a comber.
2. To study the function of top comb and its depth of penetration with reference to noil extraction and fractionating efficiency.
3. To study the nature of movement of nipper assembly.
4. To study the mechanism of detaching roller drive and the nature of its motion.
5. To study the effect of type of feed and detachment setting on noil percentage and fractionating efficiency.
6. To estimate the noil percentage in comber.
7. To study the construction and working of speed frame.
8. To study the differential motion of speed frame and calculation of Bobbin speed.
9. To study the gearing diagram of speed frame and calculation of break draft constant, draft constant, twist constant and production.
10. To study the building motion in Ring Frame.
11. To study the gearing diagram of Ring frame and calculation of Draft constants, Twist constant, Coils per inch and production.
12. To study the construction and working of Ring Frame.
13. To study the construction and working of Rotor Spinning.
14. To study the construction of and working of Dref-2 friction spinning machine.
15. To study the construction and working of Dref-3 friction spinning machine.
16. To study the construction and working of Air-jet Spinning machine.

## FABRIC MANUFACTURE LAB.-II

**Subject Code: BTEXS1-407 LT P C 0 0 2 1 Duration: 20 Hrs.**

At least 10 experiments are to be performed by each student

1. To select the proper reed and heald for a weaver's beam keeping in mind the beam, loom size and fabric construction.
2. Study of shedding mechanism of shuttle loom and cam positioning with respect to loom cycle.
3. Study of picking mechanism, Picker movement in relation with crank shaft rotation & calculation of average velocity of shuttle.
4. Study of Beating up system in conventional loom
5. Study of sley movement, construction and calculation of sley eccentricity.
6. Study of take up motion and calculation of loom take up constant.
7. Study of positive let-off system.
8. Study of Warp protection motion (both loose reed and fast reed).
9. Study of warp stop motion.
10. Study of side/centre weft fork mechanism.

## TEXTILE CHEMICAL PROCESSING LAB. – I

**Subject- BTEXS1-408 L T P C 0 0 2 1 Duration: 20 Hrs.**

At least 10 experiments are to be performed by each student

1. Scouring of cotton goods
2. Scouring of polyester goods
3. Scouring of P/C blended goods
4. Scouring of wool fibre
5. Degumming of silk
6. Bleaching of cotton with $H_2O_2$
7. Bleaching of cotton with $NaClO_2$
8. Bleaching of cotton with NaOCl
9. Bleaching of Polyester
10. Bleaching of P/C blend
11. Bleaching of jute yarns / fabric
12. To finish cotton fabric with

• Water repelling agent
• Urea – formaldehyde

## FABRIC STRUCTURE & ANALYSIS LAB.

**Subject- BTEXS1-409** **LT P C 0 0 2 1** **Duration: 20 Hrs.**

At least 10 experiments are to be performed by each student

1. Analysis of different fabric samples to know their particulars as stated:
2. For Yarns: Ends & Picks/inch, Warp & Weft Count & Crimp, Warp & Weft Crimp, Ply & Twist.
3. For Fabrics: Tape length, Reed width, Denting order, Weight of warp & Weft & fabrics, Weight per square yard, Warp & weft cover, Colour plan, and use.

1. Plain & derivatives
2. Twill & derivatives
3. Diamonds & Drapers
4. Honey comb
5. Huck-a-back
6. Mockleno
7. Welts & Piques
8. Stripe &Cheques
9. Satin / Sateen
10. Crepe
11. Terry pile
12. Colour& Weave effect.
13. Double Cloth