FINAL YEAR B.TEXT. (MMTT) SEMESTER-I

SR. NO.	COMMTTON TO COURSES	SUBJECTS	TEACHING SCHEME				EXAMINATION SCHEME				
			L	T	DR	PR	TP	TW	OE	PE	SUB. TOTAL
7.1	TT/MMTT	PROCESS MANAGEMENT IN YARN FORMING-I	3	---	---	3	100	50	---	---	150
7.2	TT/MMTT	PROCESS MANAGEMENT IN FABRIC FORMING-I	3	---	---	3	100	50	---	---	150
7.3	**MMTT**	*** STRUCTURE & PROPERTIES OF MANMADE YARNS & FABRICS**	**3**	**---**	**---**	**3**	**100**	**25**	**---**	**50**	**175**
7.4	TT/MMTT/TPE	TEXTILE MILL PLANNING & ORGANISATION	4	---	---	---	100	25	---	---	125
7.5	**TT/MMTT/TPE/TC**	*** INDUSTRIAL ENGINEERING**	**3**	**---**	**---**	**---**	**100**	**---**	**---**	**---**	**100**
7.6	MMTT	ELECTIVE -I	3	---	---	---	100	---	---	---	100
7.7	TT/MMTT/TPE/TC	SEMINAR-I	2	---	---	---	---	50	---	---	50
7.8	TT/MMTT/TPE/TC	INPLANT TRAINING-II	---	---	---	---	---	50	---	---	50
			21	---	---	9	600	250	0	50	900

L =LECTURES
T =TUTORIALS
DR=DRAWING
PR=PRACTICALS

TP=THEORY PAPER
TW=TERM WORK
OE=ORAL EXAMINATION
PE=PRACTICAL XAMINATION

LIST OF ELECTIVE-I

1. FIBRE COMPOSITES
2. GARMENT MANUFACTURING TECHNOLOGY
3. TEXTILE PRODUCT ENGINEERING
4. ECONOMICS

FINAL YEAR B.TEXT. (MMTT) SEMESTER-II

SR. NO.	COMMTTON TO COURSES	SUBJECTS	TEACHING SCHEME				EXAMINATION SCHEME				
			L	T	DR	PR	TP	TW	OE	PE	SUB. TOTAL
8.1	TT/MMTT	PROCESS MANAGEMENT IN YARN FORMING-II	3	---	---	3	100	25	---	50	175
8.2	TT/MMTT	PROCESS MANAGEMENT IN FABRIC FORMING-II	3	---	---	3	100	25	---	50	175
8.3	TT/MMTT/TPE/TC	TEXTILE MILL MANAGEMENT	3	---	---	---	100	---	---	---	100
8.4	TT/MMTT	TECHNICAL TEXTILES	4	---	---	---	100	---	---	---	100
8.5	MMTT	ELECTIVE -II	3	---	---	---	100	---	---	---	100
8.6	TT/MMTT/TPE/TC	SEMINAR - II	2	---	---	---	---	50	---	---	50
8.7	TT/MMTT/TPE/TC	DISSERTATION	---	---	---	6	---	50	100	---	150
			18	---	---	12	500	150	100	100	850

L =LECTURES
T =TUTORIALS
DR=DRAWING
PR=PRACTICALS

TP=THEORY PAPER
TW=TERM WORK
OE=ORAL EXAMINATION
PE=PRACTICAL XAMINATION

LIST OF ELECTIVE-II

1. FASHION TECHNOLOGY IN APPARELS & MADE-UPS
2. HOME TEXTILES
3. NON-WOVENS & GEO-TEXTILES
4. MAINTENANCE MANAGEMENT IN TEXTILE
5. ORGANIZATIONAL BEHAVIOUR AND HUMANITIES

FINAL YEAR B. TEXT - SEMESTER-I

7.1 PROCESS MANAGEMENT IN YARN FORMING-I (TT/MMTT)

Lectures	:	3 Hrs / Week
Practicals	:	3 Hrs / Week
Theory Paper	:	100 Marks
Term Work	:	50 Marks
Subject Total	:	150 Marks

I) **Introduction to process management –** Meaning of process management, functional and process management, various phases of process management like planning, organizing, linking of customer feedback and process management, cycle of process management

II) **Raw material management –** Importance, need of instrumental evaluation, traditional methods of cotton selection, importance of cost in raw material, cotton marketing, use of linear programming for mixing, bale management yarn engineering & raw material, practical applications of AFIS & HVI.

III) **Yarn Realization –** Importance, estimation process, norms for various yarns like cotton, blended, analysis of yarn realization from mills.

IV) **Process management in blow room & card –** Blow room & card as integrated system, control of waste, cleaning efficiency, neps & fibre rupture, contamination control, selection of proper sequence process parameters, Influence of various factors in blow room & card.

V) **Process management in comber preparatory & combing –** Significance & importance of good lap for comber, evaluation of comber performance, fractionating efficiency of comber, comber waste analysis, influence of various factors on combing performance.

VI) **Process management in draw frame & speed frame –** Revision of basic principle of drafting, drafting wave & its significance, roller nip movement, roller speed variation, roller vibration, influence of parameters like speed, setting. Influence of process parameters like flyer speed, twist, stretch on roving quality, process control in speed frame.

VII) **Introduction to total quality management (TQM) –** Fundamental concepts of TQM, Basic approach, historical review, quality & business performance service quality versus product quality, obstacles.

VIII) **Organizing for TQM –** The system approach, organizing for quality implementation, switching over from traditional quality to total quality management, roles in transition, small group & employer involvement, team for TQM.

IX) **ISO 9000 & Total Quality –** Concept of ISO 9000 series, other quality systems, implementation, documentation, post certification, ISO / QS 9000 elements, internal auditing.

X) **Application of some modes of quality engineering –** Taguchi techniques, factional design, FMEA, TPM

List of Experiments

1. Testing of various cotton samples & their suitability for various counts.
2. Setting up of standards for given cotton to process upto draw frame for carded & combed counts.
3. To evaluate performance of a blow room for given cotton.
4. To evaluate performance of card for a given cotton.
5. To study effects of various parameters on transfer efficiency of card.
6. To study fibre orientation by No. of passages on draw frame with Lindsley technique.
7. Influence of step gauge setting on sliver quality.
8. To study effect of cylinder speed at comber.
9. To study stretch in roving & effect on U%, coil spacing.
10. To study break draft & its effect on roving quality.
11. To adjust wrapping & A% on RSB D30
12. Mill visit to study process management.

Reference Books

1. Quality Planning & Analysis – Product Development through use by Frank M. Gryna, McGraw Hill International.
2. Testing & Quality Management by Dr. V. K. Kothari, AFL Publication – Process in Textiles.
3. Textile Quality Physical method of Product & Process Control by Mairio Bona COMMETT program of EEC.
4. Process Control in Spinning by A. R. Khare & T. R. Subramaniam, ATIRA Publication.
5. Quality Control in Spinning – SITRA publication.
6. Principles of Roller Drafting by Foster, Manual of Textile Technology.
7. Monograph Series by BTRA.

8. Total Quality Management – A How to program for high performance business by John M. Kelly, Published by Aleycuder, Hamitton Institute Inc.
9. Textile Quality – Physical Methods of Product & Process Control by Mario Bona.
10. Total Quality Management by D. H. Bester Field et al Pearson Education, Inc.
11. ISO 9000 – Meeting the new international standards by Perry L. Johnson McGraw Hill Inc.

FINAL YEAR B. TEXT - SEMESTER-I

7.2 PROCESS MANAGEMENT IN FABRIC FORMING-I (TT/MMTT)

Lectures	:	3 Hrs / Week
Practicals	:	3 Hrs / Week
Theory Paper	:	100 Marks
Term Work	:	50 Marks
Subject Total	:	150 Marks

I) **Introduction to process management:**

a) Object, scope and approach to achieve optimum quality and productivity in fabric production,

b) Methodology adopted for the same (SQC, Direct Approach, and online monitoring)

II) **Quality and production management in winding:**

a) Control of yarn joints quality on Automatic Winding machines for various materials – knots (type and quality parameters, machine adjustments) and splice (characteristics of good splice, appearance and strength ratings, splice testing, and adjustment of parameters), precautions in winding of Elastomeric, Dyed, Monofilament yarn etc

b) Yarn clearing: Yarn defects, classimat classification, imperfections, Clearer Setting adjustments, condition of clearers and its maintenance, assessment of performance of winding machine (knot factor, clearing efficiency).

c) Unwinding and winding tension, relation with type of material and speed, special devices and their adjustments on machine (auto tense, auto speed)

d) Package quality: Causes and Remedies of package defects: -i) Cobweb, ii) transfer tail, iii) nose tail, iv) external package damage, v) cauliflower, vi) hard and soft yarn layers, vii) package density, viii) LH & RH end on flack, ix) loose end, x) Patterning, xi) Yarn guiding failures, xii) double ends, xiii) sloughing yarn layers,

e) Method of assessing the productivity and adjustments in relation to material and count of yarn,

f) Material handling and work practices for optimum production and quality

g) Management information system applicable to winding.

III) **Process management in warping:**

a) Characteristics of perfect beam and monitoring the beam quality (flange condition, yarn continuity, beam density, yarn content, yarn tension, stop motion, drum, guides).

b) Machine parameters adjustment and machine condition maintenance for minimizing end breaks for various materials and counts.
c) Method of assessing productivity of warping machine & measures to improve the productivity.
d) Material handling and work practices to optimize production and quality.
e) Management information system.

IV) **Process management in sizing:**

a) Deciding the size recipe according to material and count of yarn, Preparation of quality size pastes w.r.t. concentration, viscosity and other properties.
b) Determination and achieving the correct size pick up by controlling various sizing conditions, Modern pick up control equipment.
c) Stretch and moisture level control on multicylinder sizing machine.
d) Characteristics of perfect sized beam and its achievement (sticky, cross, broken and missing ends, defective selvedge).
e) Method to increase weavability (wet splitting, after waxing, dry steaming etc.)
f) Minimizing the size losses at every stage.
g) Control of productivity.
h) Material handling and work practices to get optimum production and best-sized beams.
i) Management information system.

V) **Process management in pirn winding:**

a) Minimizing end break and stoppages due to mechanical failures.
b) Improvement of bobbin build.
c) Control of productivity.

VI) **Process Management in drawing - in and warp tying.**

a) Evaluation of quality in drawing - in and warp tying.
b) Selection, storage use and reuse of healds, reeds and drop pins of Various types, (parameters of heald reed, drop-pins that affect weaving performance
c) Precautions during drawing - in and warp tying process.
d) Productivity, norms and control.

VII) **Hard waste Reduction in Weaving Department:**

a) Approach to the reduction of hard-waste
b) Setting the standards of hard-waste
c) Ways to reduce hard-waste of different types in winding, warping, sizing, Pirn winding, drawing & loom shed.

d) Ways to reduce warp and weft related hard waste on shuttle less looms generated due to false selvedges.

VIII) **Reduction in consumption of accessories:**

a) Selection of accessories (Tests, quality)
b) Care of accessories (storage, dispensing)
c) Ways to reduce wear and tear and breakdown of costly spares

List of Experiments

1) Optimization of clearer and splicer parameters for different yarn counts and operate the winding machines to observe the results
2) To determine the end breakage rate of warping machine and calculate warping efficiency with the sett details in the visiting unit.
3) To determine size pick up by changing variables on the sample sizing machine to find effect on yarn properties
4) To prepare beam on the sample warping / sizing machine
5) To weave fabric of various weaves on sample weaving machine and observe its effect on the appearance on the fabric
6) Preparation of the jacquard design and to weave fault free fabric on loom with electronic jacquard
7) Setting of Rotary dobby
8) To determine the % loss of efficiency for probable reasons in the visiting weaving unit
9) Inspection and mending of fabric defects and determination of the packing percent of the given Fabric length in the visiting unit
10) Fabric Analysis 2 samples
11) Fabric Analysis 2 samples
12) Fabric Analysis 2 samples

Reference Books

1) Process Control in Weaving by M.C. Paliwal & P.D. Kimothi
2) Weaving: Technology and Operations by Allan Ormerod.
3) Weaving Machine, Mechanisms, Management by Dr. Talukdar, Ajagaonkar,
4) Sriramulu.
5) ATIRA, BTRA Publications for Norms on Winding, Warping, Drawing in Looms.
6) Machine Manuals of Various Shuttle less Looms and – Preparatory Machines.

7) Preventive Maintenance of Plain and Auto Loom – By BTRA.
8) Manual of shuttle less Weaving: PSG College Publication.
9) Shuttle less Weaving: NCUTE Publication.
10) Shuttle less Weaving: NCUTE Publication.

FINAL YEAR B. TEXT - SEMESTER-I

7.4 TEXTILE MILL PLANNING & ORGANISATION (TT/MMTT/TPE)

Lectures	:	4 Hrs / Week
Theory Paper	:	100 Marks
Term Work	:	25 Marks
Subject Total	:	125 Marks

I) **Project Planning** - Introduction, Capital investment required for project, Phases of Capital Budgeting, Difficulties in Capital expenditure, Phases involved.

II) **Machinery Specification, Selection & Calculation for No. of Machines** - Selection of machines & machinery specifications required for the product in spinning, weaving, knitting etc.

Calculation for no. of machines in spinning /spin plan - Preparation of organization for ring spinning mill and preparatory, departments based on ring spindle capacity and production of ring spun yarn. (Carded, Combed, Blended, Folded) Preparing organization of rotor spinning mill. Calculation regarding efficiency, waste, draft, twist, production rates, amount of raw material required and no. of machinery required at different stages of processing.

Calculation for no. of machines in weaving / weave plan - Preparation of organization for shuttle & shuttleless weaving mill and preparatory departments based on number of weaving machines & production of different cloths. Calculation regarding efficiency, waste, crimp, production rates, raw material and no. of machinery required at different processes.

III) **Plant & Machinery Layout** - Significance of the concept, objectives and principles of layouts, kinds of layouts and their comparisons, flow pattern, work station design, tools and devices of making layouts, use of Auto-Cad for layouts, storage space requirements, plant layout procedure, factors influencing layouts, selection of layout, effect of automation on plant layout, symptoms of bad layout. Layout aspects of spinning, weaving, knitting and composite mills. Spatial requirements of spinning / weaving / knitting machines.

IV) **Site Selection** - Selection of site for textile mills, General location, Actual selection of specific site, Calculation of spatial requirements, factors influencing site selection, Climatic considerations, geo-technical report, bearing pressure etc. General information about textile manufacturing industry centers in India.

V) **Civil/Building Construction** - Consideration in building design, size, shape and configuration of building. Architectural & structural aspects of textile mill building. Building morphology, General principles of building construction & building functions, Types of factory buildings, Types of building construction. Material for construction with special reference to walls, roofs, floors, false ceilings, fire resistance, sound proof, etc. Colour schemes for buildings, interior & machinery in textile mills. Cost considerations in building construction, Orgonogram of building construction, Team, Tenders & Contracts.

VI) **Formulation of a Project Report for Spinning, Weaving, Knitting Units** - Assumptions, Machinery Organizations, Requirement of Miscellaneous Fixed Assets & Machinery Stores & Spares, Requirement & Calculations related to Electrical Power, Lighting, Water, Steam, Compressed Air, etc.

VII) **Materials Handling** - Definition and importance of materials handling, functions and principles of materials handling, material handling methods, engineering and economic factors, relationship to plant layout, selection and type of material handling equipments, study of different types of equipments used for materials handling in spinning, weaving, knitting mills.

VIII) **Labour Compliments** - Types of labour required, labour compliment, labour and staff required for spinning and weaving based on workload consideration. Use of mathematics for number of operations in deciding the workload.

IX) **Techno-economic Viability** - Calculations of cost of project – Means of Finance – Estimates of sales & production – cost of production – working capital requirement – Profitability Projection – Break even point – Projected cash flow statements.

Reference Books

1) Textile Project Management by A. Ormerod, The Textile Institute Publication.
2) Goal Directed Project Management by E.S. Andersen, K.V. Grude & Tor Hang, Coopers & Cybranl Publication.
3) Project, Planning Analysis, Selection Implementation & Review by Prasanna Chandra, Tata McGraw Hill Publishing Co. Ltd.,
4) Management of Textile Production, A. Ormorod. Newnes – Butter Wortrs Publication.
5) Plant location, Layout & Maintenance by Ruddele Reed.
6) Industrial Organisation & Engg. Economics T.R. Banga & S.C. Sharma, Khanna Publishers, Delhi.

7) Norms for Process Parameters, Productivity etc. ATIRA, BTRA, SITRA, NITRA, etc.
8) Trade Literature of Different Machinery Manufacturers.
9) A Weavers' View Can We Afford Not to invest by L. Cegielka M.A, The Textile Institute Publisher.

FINAL YEAR B. TEXT - SEMESTER-I

7.5 INDUSTRIAL ENGINEERING (TT/MMTT/TPE/TC)

Lectures	:	3 Hrs / Week
Theory Paper	:	100 Marks
Subject Total	:	100 Marks

I) **Introduction –** Concept of Industrial Engineering, definition, history & development, various techniques of Industrial Engineering, Scope in Textiles.

II) **Production Planning & Control (PPC) –**

a) Production – Definition, Types of production, characteristics of each type production.

b) Productivity – Definition, ways to increase productivity, measurement of productivity – Total productivity Index & factor productivity indices.

c) Definition of PPC, Functions of PPC

d) Sales forecasting, various techniques of sales forecasting, problems.

e) Gantt chart, types, use.

III) **Work Study –** Definition, techniques, objectives, use of work study to increase productivity.

a) Method Study – Definition, steps in method study, details of every step, charts used for recording, outline chart, flow process chart & its types, two handed process chart, multiple activity chart, principles of motion economy.

b) Micromtion Study – Contribution of Gilbreth, Therbligs, Prodedure, SIMO Chart.

c) Work Measurement – Definition, Techniques, concept of total time, standard time, allowances, MTM, problems.

IV) **Operation Research –** Definition, various techniques of OR.

a) Basics of linear programming – Formulation of LP, Graphical solution, simplex method, problems.

b) Network Analysis – PERT, CPM, and comparison.

V) **Plant Location –** Importance of site selection, factors affecting, urban, rural & suburban area, selection of site for textile & engineering plant.

VI) **Plant Layout –** Factors affecting plant layout, Types of plant layouts, Layout procedure, Use of computer in plant layout.

VII) **Value Engineering –** Value, concept of value analysis, concept of value engineering, Reasons of unnecessary cost, value analysis procedure.

VIII) **Job Evaluation & Merit Rating –** Objectives & methods.

IX) **Inventory Control –** Concept, Types, ABC Analysis, EOQ, EBQ.

X) **Machine Interference –** Introduction, Ideal automatic machines, semi automatic with cycle servicing – semi automatic with random servicing.

Reference Books

1) Work Study – ILO
2) Work Study in Textiles – ILO
3) Elements of Production Planning & Control – Samual Eilon.
4) Industrial Engineering & Management – Banga Sharma.
5) Industrial Engineering & Management – O. P. Khanna.
6) Industrial Engineering Manual of Textile Industry – Nobert Lioyd Enrick.
7) Industrial & production engineering – Sanjay S. Patil, & Nandkumar Hukeri.

FINAL YEAR B. TEXT - SEMESTER-I

7.6 GARMENT MANUFACTURING TECHNOLOGY (TT/MMTT/TPE/TC) (ELECTIVE-I)

Lectures	:	3 Hrs / Week
Theory Paper	:	100 Marks
Subject Total	:	100 Marks

I) **The Garment Industry**: Structure of the garment Industry, sectors of Industry, product types and organization. Apparel industry in India, Domestic industry, size of the industry, nature of the industry, its developments in recent years. Export industry: Size and nature of the industry.

II) **Manufacturing Technology**:

- Types of Fabric Packages – Types of Fabrics – One Way – Two Way Fabrics –Their effect on spreading –Methods of Fabric spreading – Spreading equipments – Computerized spreaders – Marker making –Marker efficiency – Factors affecting marker efficiency – Marker duplicating methods – Computer aided marker making.
- Introduction to cutting machines – Types and functions of cutting machines – straight knife, round knife,band knife, cutting machines – Notches, drills, die cutting machines – Computerized cutting machines –maintenance of cutting machines – common defects in cutting & their remedies.
- Types of needles – Parts of needles and their function – Needle size - sewing thread – properties of sewing threads – ticket number – fabric sewability. Seam quality – effect of stitch type on seam quality. Selection of seam and stitch.
- Federal classification of seam and stitches – Basic parts of sewing machine – Needle – Bobbin case /Bobbin hook, Loopers – Loop spreader – Threading fingers – Throat plate – Tongue chaining plates – Takeup devices – Tensioners – Feed dog – Pressure foot for sewing.
- Sewing Technology : feed systems, , machinery and equipment, basic sewing machines, like general sewing, over locking, safety stitching, blind stitching, button holes, bartacking, & button sewing, special sewing machines like three thread overlock with a microprocessor, Sewing

problems, slipped stitches, stay gered stitches, unsalaneed stitching pocker etc.

a) Fusing Technology: Construction of Fusibles, Fusing process, Fusing machinery, quality control.

b) Application of various components such as buttons, zips, underlining, Hooks and ornamental materials, - fly, kissing, lap; Button and buttonholes, hooks and eye snaps, Velcro and other accessories.

c) Pressing Technology: Classification, components of Pressing, machinery and equipments viz. Hand irons, dry iron, electric steam iron, under pressing, top pressing, scissors press, assept or drower, Carousel machines, Steam dolly, tunnel finishing, controls, handling systems, boiler room.

d) Garment Finishing and Inspection:Attaching buttons, marking, sewing labels, cleaning, final touch, fitting quality, live models, measurements, viewing the garments, quality standards.

III) **Production Technology**: Manual systems, making through, section system, progressive bundle system, straight line system, mechanical transport systems, selective conveyor belt system, unit production system, quick response sewing system.

- ❖ Ware Housing: Handling equipment, storage equipment, packing equipment.
- ❖ .Basic Pattern Making: Measurement Taking – Size chart and Measuring of Sizes. Definition of various garments parts & positions. Methods: Bespoke method & Industrial method (Using Blocks) – Basic block construction – Block preparation & correction. Figure analysis: Body ideals, body proportion, height, weight distribution, body parts, individual figure analysis, study of body measurement of all age groups. Preparation of basic blocks, muslin pattern, commercial pattern, sizes and its understanding, fabric preparation for garment construction.
- ❖ CAD/CAM in Garment Manufacturing.

Reference Books

1) Garment Technology for fashion designers by Gerry Cooklin
2) Introduction to clothing Manufacturing by Gerry Cooklin
3) Clothing construction and wardrobe planning by Dora S. Lewin, Mabel Goode Bowers, Manetta Knttunen — The Macmillan co New York
4) Garment Technology by Dr. V.Subramaniam — Winter School booklets 1990
5) BIS publications 1989.

FINAL YEAR B. TEXT - SEMESTER-I

7.6 TEXTILE PRODUCT ENGINEERING (TT/MMTT) (ELECTIVE-I)

Lectures	:	3 Hrs / Week
Theory Paper	:	100 Marks
Subject Total	:	100 Marks

I) **Product Engineering** – Scope and objectives, Product design procedure, Selection of raw material and product, Product analysis, Production aspect, Product design, Consideration of a good product design, Design specifications, Preliminary design, Maintainability, Reliability and Redundancy, Final design, Modular design, Computer aided design, Process selection, Product life cycle, Criteria for product success.

II) **Market Research & Customer Requirement Analysis** – Product Research – Market Research, Material Research, Equipment and process research, Benchmark analysis, Customer requirement analysis. Product Appraisal – Functional and aesthetic analysis, Manufacturing and economical analysis.

III) **Textile Designs** – Printed and constructed designs, range planning, Range development, Range presentation, Retailing business, Merchandising, Information generation. Design for quality, Essential, Desirable and undesirable properties of textiles, Effect of changes in fibre, yarn type and fabric construction and finishing on performance and serviceability of textile products.

IV) **Simulation of specified properties or structures leading to design** – Special yarns, Woven fabrics, Non – woven fabrics, Simulation of material, Texture by using computer graphics, Concept of overall designing procedure.

V) **Case studies related to following product development** – Design of non – woven for filtration, Development of needle punched fabrics for geo technical applications, Design of Suture threads, twines & ropes, Geo textiles, Parachute etc.

Reference Books

1) Hand book of Textile Design Principles, Process and Practice by Jacquie Wilson, Textile Institute Publication.
2) The Design Logic of Textile Products, Textile progress vol. 27, No. 3, T Matuo and M. N. Suresh. The Textile Institute Publication.
3) Engineering Design by George Dieter.
4) Total Quality Management by Dale H. Besterfield.
5) Proceedings of the Seminar – Non woven Technology, Market and Product Potential, IIT, New Delhi, December 2006.

FINAL YEAR B. TEXT - SEMESTER-I

7.6 ECONOMICS (TT/MMTT/TPE/TC)

(ELECTIVE-I)

Lectures	:	3 Hrs / Week
Theory Paper	:	100 Marks
Subject Total	:	100 Marks

I) **Definition of Economics** – Nature and scope – Economy – Types – Problems and functioning – Basic terms and concepts

II) **Human Wants** – Consumption and standard of living – Demand Analysis – Consumer's surplus – Demand and law of demand – Elasticity of demand.

III) **Scale of Production** – Laws of returns – Costs and cost curves – Supply and supply curves – Markets and market forms – Equilibrium of the firm and industry.

IV) **Price Determination under perfect competition** - A preliminary Idea – Price determination under perfect competition – market price and normal price – price determination under imperfect competition

V) **National Income** – Concept and importance – Nature and functions of money – Monetary standards – Theory of money and prices.

VI) **Credit and Credit Instruments** - Banking – Central Banking.

VII) **International Trade** - Balance of payments – Foreign exchange rate determination.

VIII) **Public Expenditure** – Public revenue – Taxation – Public Finance – Public Debt.

IX) **Economics Systems** - Capitalism – Socialism – Mixed Economy

Reference Books

1. Elementary Economics Theory by K. K. Dewett and J. D. Varma
2. Basic Economics by James A. Dgal, Nicholas Karatjas
3. Applied Economics by Derek T. Lobley.
4. Micro Economic Theory by M. C. Vaish.
5. Principles of Economics by D. N. Dwived.
6. Economics Analysis, Decision Making & Policy by George Leland Bach.
7. Contemporary Economics by Milton H.
8. Engineering Management by Frgidon Mazda – Addison Weley Longman Pearson Education.
9. Economics Environment of Business by V. K. Garg Sultan Chand & Sons Educational Publishers.
10. Management for Business and Industry by Cloute S. George.
11. Essentials of Management by Koontz Odonell.

FINAL YEAR B. TEXT - SEMESTER-I

7.7 SEMINAR-I (TT/MMTT/TPE/TC)

Lectures	:	2 Hrs / Week
Term Work	:	50 Marks
Subject Total	:	50 Marks

Topic -

In the beginning of the semester, every student individually will be assigned a seminar topic in the emerging / perspective field in the area of textiles such as Spinning, Weaving, Fibres, Testing, Chemical processing and alike.

Seminar Preparation and Presentation -

Students will collect the information on the above subjects and submit the report both soft and hard copy on the dates specified by the concerned faculty. The seminar report will be of minimum 15 pages. The spacing between the lines will be 1.5. The font size will be 12 point with New Times Roman. The list of reference must be given at the end of seminar report. The list of reference should be written as per the Textile Research Journal format.

Term Work Marks –

Seminar Report	-	25 Marks
Presentation	-	25 Marks

FINAL YEAR B. TEXT - SEMESTER-I

7.8 INPLANT TRAINING-II (TT/MMTT/TPE/TC)

Term Work : 50 Marks
Subject Total : 50 Marks

Objective:

To provide an opportunity to observe industrial activities and gather related technical and non-technical information about industry working.

Training Period:

One Month after completion of second semester of Third Year B.Text.

Industry:

Spinning, Weaving, Garment, Processing, Synthetics, Textile Chemicals & Auxiliaries, R&D, Machinery Manufacturing, Marketing etc. (Any One).

Observations:

Observe working of industry and collect data as per guidelines in the manual, study machineries / systems / practices.

Training Report:

* Report should have Title on Cover of Report as per Format.
* Report should be prepared as per following sequence -

I Page Certificate from Institute as per Format.
II Page Acknowledgement
III Page Programme of Training
IV Page Introduction of Industry
V Page Index with Page Numbers
VI Page Plant/Dept. Layout
VII Page Organization Structure.
VIII Page Department wise / Product wise Report: Report should (Onwards) be based on Own Observations made, data colleted during Inplant Training (i.e. Study of Machinery, Actual Production and Efficiency, Production Control, Modern Developments in Machines/Process, Flow Chart of Processes, Speed of Important Parts, Labour Allocation, Maintenance Practices, Process Control & Quality Control Activities etc.) roles and responsibilities of various Workers/Technical Staffs.

Special Study: Mini Project Undertaken, Costing, Production Planning & Control, Target Achievement, Information regarding humidification plant, Utility, Electrical Supply, Store, Purchase, Marketing, Sales, Samples, Lay-out of Mill etc.

Assessment:

Viva-voce to be conducted in first semester of Final Year B.Text. Term Work Marks are assigned on the basis of student's performance in viva-voce, conducted by internal and external examiners from related field.

FINAL YEAR B. TEXT - SEMESTER-I

7.3 STRUCTURE & PROPERTIES OF MANMADE YARNS & FABRICS (MMTT)

Lectures	:	3 Hrs / Week
Practicals	:	3 Hrs / Week
Theory Paper	:	100 Marks
Term Work	:	25 Marks
Practical Exam	:	50 Marks
Subject Total	:	175 Marks

I) **Classification and Structure of yarn -** Classification of yarns, Yarn structures – fundamental structural features of yarns. Structurally related performance of yarn, effect of mechanical & chemical treatment.

II) **Twist in Yarns -**Geometry of twisted yarns. Idealized helical geometry, twist contraction, twist and packing of fibres in yarns, idealized packing and packing in actual yarn. Influence of twist in man-made fibres on other yarn properties.

III) **Form and fibre arrangement in twisted yarns –** Fibre migration – Ideal migration, Characterization of migration behavior, Factors affecting migration of man-made fibres in the yarn.

IV) **Theory of the extension of continuous filament yarns –** Simplest analysis of tensile behavior, analysis with transverse forces & lateral contraction, analysis for large extension, prediction of breakage, prediction of load - extension curve. Observed extension & breakage of continuous filament yarn. Terminology and definitions of the same, breakage effect of twisting method on tensile properties.

V) **Mechanical Properties of Yarns –** Mechanics of yarn structures, Tensile behavior of continuous filament yarns. Influence of processing factors on tensile properties of yarns. Observed extension & breakage of spun yarns, experimental studies.

VI) **Structure of Fabric -** Classification & Structures of fabrics, geometrical properties of fabrics made from man-made fibre yarn.

VII) **Transmission properties of Textile Structures - i)** Thermal transmission – terminology, factors affecting thermal behaviour of fabrics, measurement of thermal behaviour. **ii)** Air permeability – Nomenclature, factors affecting air-permeability. Measurement of air-permeability **iii)** Moisture Transmission – Nomenclature, factors influencing moisture transmission, measurement of moisture transmission ability of fabric. **iv)** Water Repellency and Water Proofing: -

Nomenclature, Mechanics of wetting, factors affecting water repellency of textiles, water proofing, measurement of water proofing & water repellency.

VIII) **Crease Retention, Wrinkle Resistance & Dimensional Stability -** Nomenclature, mechanics of wrinkle resistance, factors influencing the wrinkle resistance & its measurement, dimensional stability & shape retention.

IX) **Serviceability, Wear & Abrasion -** Nomenclature, serviceability, wear & abrasion. Mechanics of abrasion, Influence of fabric/yarn/fibre structural parameters on abrasion resistance of fabric, Measurements of abrasion, Analysis of end point for abrasion resistance.

X) **Fabric Hand -** Objective & subjective evaluation of textiles, Hand & drape- Nomenclature, Methods of measuring fabric stiffness & drape. Factors influencing fabric hand. Measurement of fabric hand by Kawabata & FAST techniques.

List of Experiments

1) Dry & Wet tenacity of cotton / blends.
2) Measurement of Filament Friction by Zweigle Friction Tester..
3) Estimation of Fabric Wear performance by using Universal Wear Tester.
4) To estimate Crease recovery of Heat Set & Non- Heat Set Polyester Fabrics
5) To compare Thermal Insulation Behaviour of Staple Yarn & Filament Yarn, Woven Fabric.
6) To estimate the Filament Diameter by using microscope
7) To estimate the Water proofing ability of fabric by water head tester.
8) Analysis of different Weave fabrics for its Cover Factor & GSM.
9) To Study the Bending behaviour for Filament & staple Yarn Fabric by Cyclic Bending Tester.
10) To determine Air permeability of different Fabrics.
11) To determine the puncture resistance of Non-woven Fabric.

Reference Books

1) Structural Mechanics of fibres, yarns & fabrics by Herle, Grosberg and Backer.
2) Textile Yarn by Martindale and Goswami.
3) Properties of fibres, yarns & fabrics by Kaswel.
4) Physical Testing and quality control textile progress, Vol.23, No.1/2/3, by K. Slater.
5) Principle of Textile Testing by J.E. Booth.
6) Mario Bona – Textile Quality (Eurotex Series).
7) Cotton Testing by Steadman,
8) Physical Testing of Textiles by B.P. Saville
9) Textile Testing – Fibre Yarn & Fabric – by Dr. Arindam Basu (ATIRA)
10) Testing & Quality Management by Dr.V.K. Kothari (IIT-Delhi)

FINAL YEAR B. TEXT - SEMESTER-I

7.6 FIBRE COMPOSITES (MMTT) (ELECTIVE-I)

Lectures	:	3 Hrs / Week
Theory Paper	:	100 Marks
Subject Total	:	100 Marks

I) Introduction – Definition, General Characteristic, Applications

II) **Materials** – Fibres, Matrix, Thermoset matrix, thermoplastic matrix, fibre surface treatment, fillers and other additives, incorporation of fibres into matrix, fibre content, density & void content

III) **Mechanics** – Fibre - matrix interactions in a unidirectional lamina, characteristics of fibre reinforced lamina, Laminated structure, Inter lamina stresses.

IV) **Performance** – Static, mechanical properties fatigue properties, impact properties, other properties, environmental effects, long term properties, fracture behaviour & damage tolerance.

V) **Manufacturing** – Fundamental, Bag molding process, compression molding, pultrusion, filament winding, other manufacturing process, Manufacturing process for thermoplastic composites, quality inspection methods.

VI) **Design** – failure predictions, laminate design considerations, joint design, design examples, application examples.

VII) **Metal and ceramic Matrix composites** – Metal Matrix composites, ceramic Matrix composites,

VIII) Analysis and modeling of three dimensional textile structural composites.

Reference Books

1. Fibre reinforced composites – Materials Manufacturing and design – P. K. Mallick
2. High tech fibrous materials composites bio medical materials, Protective clothing & geo textiles – Vigo & Turbak
3. Carbon fibres in composites materials – R. M. Gill.

FINAL YEAR B. TEXT - SEMESTER-II

8.1 PROCESS MANAGEMENT IN YARN FORMING-II (TT/MMTT)

Lectures	:	3 Hrs / Week
Practicals	:	3 Hrs / Week
Theory Paper	:	100 Marks
Term Work	:	50 Marks
Practical Exam	:	50 Marks
Subject Total	:	200 Marks

I) **Process Management in Ring Spinning –**

a) Influence of various parameters on yarn quality

b) Control of yarn count & strength. Within & between bobbin variation, Role of auto leveller at draw frame.

c) Control of yarn evenness & imperfection – yarn evenness testing based on mass per unit length, Types of yarn irregularities, measurement causes & assessment of imperfections.

d) Control of yarn Hairiness, measurement, role played by fibre properties & process parameters.

II) **Productivity –** Importance, definition of indices of productivity, analysis & shortfall in productivity, productivity indices, standards, means to improve productivity, productivity of different sections in spinning, comparison & reasons for losses.

III) **End breaks in spinning –** Importance, assessment & controls

IV) **Channelization –** Importance & influence of channelizing material in spinning.

V) **Control of classimat faults –** Influence of fibre properties, machine parameters on classimat faults control of faults.

VI) **Other yarn & package faults –** Study & control of faults like slubs, crackers, spinners double bad piecing, double gaiting, slough off.

VII) **Yarn conditioning –** Influence of conditioning on yarn characteristics, process of yarn conditioning, process management in yarn conditioning.

VIII) **Maintenance of spinning machines –** Types of maintenance, maintenance schedules specific maintenance activities from blow room to ring spinning.

IX) On & off line monitoring systems in spinning centralized data collection systems control of foreign fibre & contamination.

X) **Total Quality Management -**

a) Leadership – Concepts, implementation, role of senior management, management role in quality, characteristics of leaders, Ethics & shared values, communication management systems, Decision making.

b) Customer focus & satisfaction – Customer perception of quality, process versus customer, feed back, service quality customer relation & profitability, buyer supplier relationship, supplier partnership, continuous process improvement, Juran Trilogy, Problem solving method “Kaizers” reengineering.

c) Bench Marking – The evaluation & essence of bench marking, reasons to benchmark, Benefits of bench marking, strategic bench marking, operational bench marking, planning, studying, learning using the findings, pitfalls & criticism of bench marking.

d) The Cost of Quality – Definition, three views of quality costs, measuring quality costs, use of quality cost, information, accounting systems, activity based costing.

List of Experiments

1) To study role of auto leveller on yarn quality.
2) To study effect of break draft on yarn quality.
3) To study effect of spacer on yarn quality.
4) To study effect of different spindle speeds on yarn quality.
5) To study effect of different travellers on yarn quality.
6) Collection of technical auditing information about spinning machines.
7) To study display & data system related to different ring frames.
8) Effect of yarn conditioning on yarn properties.
9) To study hairiness of yarn produced on different ring frames.
10) To study hairiness of yarn produced on different ring frames.
11) To compare yarn qualities of compact & normal yarn.
12) Mill visit – To observe idle spindle, end breaks & material channeling.
13) Mill visit – To evaluate blow room cleaning, waste Noil % & Soft waste.

Reference Books

1) Uster Statistics 2004.
2) Statistical Quality Control – T. V. Ratnans
3) Methods of Statistics – SITRA
4) Process Control in Spinning by A. R. Garde & T. R. Subramiam ATIRA
5) Process Control in Spinning – Dr. K. R. Salhotra

6) End Breaks in Ring Spinning – ATIRA
7) Maintenance Manuals of LMW, Rieter, Trutzschler
8) Yarn Hairiness by A. Barella Textile Progress Vol 13 No 1 Textile Institute.
9) Quality Circle – A Movement for Progress – J. B. Zende, Quality Circle Forum of India.
10) Techniques for Quality Engineering by Philips Ross McGraw Hill Publication.
11) Quality Planning & Analysis Frank, M. Grayna, McGraw Hill Publication.
12) Quality Samurai, Designal Pathways for TQM Implementation by T. R. Nataraja Edwina Pir.

FINAL YEAR B. TEXT - SEMESTER-II

8.2 PROCESS MANAGEMENT IN FABRIC FORMING-II (TT/MMTT)

Lectures	:	3 Hrs / Week
Practicals	:	3 Hrs / Week
Theory Paper	:	100 Marks
Term Work	:	50 Marks
Practical Exam	:	50 Marks
Subject Total	:	200 Marks

I) **Process management in weaving (loom shed) for Fabric quality**

a) Causes & remedies for yarn related faults: Weft bars, black ends, slubs, and thick end, Double end.

b) Causes and remedies for following fabric defects on ordinary and automatic looms & shuttle less looms. Warp streaks, Reedy, bad selvedges (curly, broken, wavy, rough) missing ends, floats, cracks, thick places and starting marks, Weft loops, snarls, stains, broken and double picks, Lashing-in, Smash, Weft slough, temple roll mark, Emery roll marks, box marks, gout, furrow appearance in terry pile, uneven fabric

c) Causes and remedies for defects on shuttle less looms for projectile, Rapier & Air jet weaving machines. (Wavy and irregular selvedge, temple marks, torn fabric, faulty weft transfers, end breaks position along the warp, weft stitching, snarls, irregular weft densities, promoting trails on selvedges, stitches, weft buckling.)

d) Fabric quality evaluation systems such as manual, and automatic fabric inspection methods, various grading systems such as major / minor, point system and fabric scan.

II) **Process management in weaving for productivity:**

a) Maintaining of loom speed on various weaving machines, limitations on maximum speed from textile point of view, mechanical condition causing reduction in speed.

b) Calculation of correct loom shed efficiency,

c) Control of technical, Human and organizational factors affecting loom shed efficiency.

d) Assessment of loom performance after corrective actions

e) Optimum loom allocations

f) Control of down time through SMED technique

g) Use of snap study in controlling efficiency losses

h) Management information system to control productivity

III) **Maintenance of machines in weaving**

a) Equipment deterioration and need of maintenance,
b) Basic aspects of maintenance, prerequisites and factors affecting maintenance activity
c) Importance of maintenance, maintenance activities (primary, Secondary areas of maintenance)
d) Objectives, maintenance policies, forms of maintenance. (Planned & unplanned maintenance). Optimum planned maintenance.
e) Cost of maintenance: elements of cost, direct & indirect costs.
f) Breakdown, preventive, corrective and predictive maintenance
g) Concept of preventive maintenance (PM) comparison with breakdown maintenance
h) Work activities in preventive maintenance: cleaning, lubrication, inspection (in detail),
i) Steps in preventive maintenance scheme.
j) Levels of preventive maintenance: productive, operative, functional, area deferred fixed time, opportunity, modular and assigned preventive maintenance.
k) Benefits of preventive maintenance and limitations
l) Maintenance of sophisticated machinery in weaving

IV) **Study of warp and cloth control**

Pick spacing, cloth fell position, bumping condition-theory, causes and remedies, research by Dr. Greenwood et al

Causes for pick space variation

Shed geometry for various fabrics setting, effect of back rest level

V) **Study of warp and weft tension during weaving**

Tension variations on automatic and shuttle less looms

Acceleration and retardation behaviour of weft for all shuttle less looms

VI) **Renewed concepts of fabric geometry**

Theory discussed by Peirce, Hearl & Shanahan

VII) **Weaving of specialty yarns and fabric**

Filament weaving, weaving with high twist yarn, and PC blend yarns, glass fiber tyre cord, parachute cloth, sized patterned warp

VIII) **Study of research articles for process management in fabric forming.**

List of Experiments

1. Adjustment of torsion bar to change the picking force on sulzer weaving machine and find its effect on working of loom by operating the loom.
2. Changing the rapier stroke, weft tension for different fabric widths and find its effect on the working of the rapiers and loom by operating the Flexible rapier loom
3. Changing the rapier stroke, weft tension for different fabric widths and find its effect on the working of the rapiers and loom by operating the Rigid rapier loom
4. Working of air jet machine with different air pressure combinations, blast timings and blast durations
5. Estimation of shuttle entry and exit of the shuttle on plain, bobbin changing auto loom and shuttle changing auto loom
6. Changing input yarn tension and fabric take down tension to find their effect on the stitch length on single jersey knitting machines
7. Changing input yarn tension and fabric take down tension to find their effect on the stitch length on Double jersey knitting machines
8. To find cost per meter for the given woven fabric considering all elements of the cost in the small scale manufacturing unit
9. To find cost per meter for the given knitted fabric considering all elements of the cost in the small scale manufacturing unit
10. Fabric Analysis 2 samples
11. Fabric Analysis 2 samples
12. Fabric Analysis 2 samples

Reference Books

1) Process Control in Weaving by M.C. Paliwal & P.D. Kimothi
2) Weaving: Technology and Operations by Allan Ormerod.
3) Weaving Machine, Mechanisms, Management by Dr. Talukdar, Ajagaonkar, Sriramulu.
4) ATIRA, BTRA Publications for Norms on Winding, Warping, Drawing in Looms.
5) Machine Manuals of Various Shuttle less Looms and – Preparatory Machines.
6) Preventive Maintenance of Plain and Auto Loom – By BTRA.
7) Manual of shuttle less Weaving: PSG College Publication.
8) Shuttle less Weaving: NCUTE Publication.
9) Shuttle less Weaving: NCUTE Publication.

FINAL YEAR B. TEXT - SEMESTER-II

8.3 TEXTILE MILL MANAGEMENT (TT/MMTT/TPE/TC)

Lectures	:	3 Hrs / Week
Theory Paper	:	100 Marks
Subject Total	:	100 Marks

I) **The Basic of Management Theory & Science** - Management & society: social responsibility & ethics.

II) **Planning** – The nature & purpose of planning – objectives – strategies – polices – planning premises.

III) **Organizing** – The nature & purpose of organizing - Basic departmentation - Organisation structure - Forms of Business organization.

IV) **Staffing** – Human resource management & selection - Performance appraisal & career strategy - Manager & organization development.

V) **Leading** – Managing & human factor - Motivation – leadership -Communication.

VI) **Controlling** – The systems & process controlling - Control techniques & information technology - Productivity & operations management - Overall & preventive control.

VII) **Cost Accounting & Control** - Introduction – Elements of Cost - Prime cost – Overheads – Factory cost – Total Cost – Selling price – Nature of cost – Types of cost – Process cost & Cost of production – Allocation of overhead – Control & accounting of material labour & overhead – Depreciation – Breakeven analysis – Breakeven chart.

VIII) **Budget & Budgetary Control** - Budget – Definition – Concept – Budgeting – Budgetary Control – Objectives of Budgets, Budgeting & budgetary Control. Advantages of Budget, Budgeting & Budgetary Control. Limitations of Budget – Types of Budget – Preparation of Budget – Budget as a means of planning, control & co-ordation – operation (working of budgetary control.

IX) **Marketing** - Introduction to marketing function – genesis of marketing the marketing concept – marketing management system – objectives – its interfaces with other functions in the organization.

X) **Marketing Research** - Meaning – Scope, Contributions – Limitations of marketing research – Profile of marketing research in India – Marketing research procedure – Types & techniques.

XI) **Financial Management** - Balance sheet – Profit loss statement – Financial ratio

Reference Books

1) Essential of Management – by Harold Koontz & Heinz, Weihrich – Tata McGraw-Hill Publishing Company Ltd., New Delhi.
2) Advanced Cost & Management Accounting by P.K. Sikdar – Viva Books Pvt. Ltd., New Delhi.
3) Industrial Engineering & Management by O.P. Khanna & A. Sarup, Dhanapat Rai Publications (P) Ltd., Delhi.
4) Dynamics of Entrepreneurial Development & Management by Vasant Desai – Himalaya Publishing House – Delhi.
5) How to Read a Balance Sheet – An ILO Programmed Book – Oxford & IBH Publishing Co. Pvt. Ltd., Delhi.
6) Enterpreneurial Development by S.S. Khanta , S. chand & Company Ltd., Delhi – 110 055.
7) Fundamentals of Marketing by W.J. Stanton, M.J. Etzel B.J. Walker – McGraw-Hill, Inc – New York, St. Laouis etc.
8) Industrial Organisation & Engineering Economics by S.C. Sharma & T.R. Banga – Khanna Publishers – 2-B, Nath Market, Nai Sorak, Delhi – 110 006.
9) Marketing Management By Philip Kotler – Prentice – Hall of India Pvt. Ltd., New Delhi – 110 001.
10) Managing Human Resource by Luis R. Gomer Mejia, D.B. Balkin & R. L. Cardy. Pearson Education (Singapore) Pvt. Ltd., Indian Branch, 482 FIE Delhi, India.
11) Cost Accounting by M.E. Thukaram Rao, New Age Internation (P) Ltd., Publishers – New Delhi.
12) Project Management by K. Nagaraja, New Age Internation (P) Ltd., Publishers – New Delhi, Bangalore etc.
13) Human Resource Management by Barry Cushway – British Library Cataloguing in Publication data – Published in association with Price Water House Coopers.
14) Management of a Small Scale Industry – Vasant Desai, Himalalya Publishing House, Delhi, Nagpur.
15) Project Management the Managerial Process by Gray & Larson, Tata McGraw Hill Publishing Co. Ltd., New Delhi.
16) Advanced Cost & Management Accounting (Problems & Solutions) by V.K. Saxena, C.D. Vashist, Sultan Chand & Educational Publishers, 23, Daryaganj, New Delhi, 110 002.

FINAL YEAR B. TEXT - SEMESTER-II

8.4 TECHNICAL TEXTILES (TT/MMTT)

Lectures	:	4 Hrs / Week
Theory Paper	:	100 Marks
Subject Total	:	100 Marks

I) **Introduction** - Definition and scope of Technical Textiles – History of Development of Technical Textiles – present status and future of Technical Textiles – Areas of Application of Technical Textiles.

II) **Coating & Lamination Textiles** - Introduction – Chemistry of Coated Textiles, materials for coating – Substrate for coating – Coating methods - Fusible interlinings – physical properties of coated fabrics - Laminating – Applications of coated fabrics.

III) **Heat and Flame Protection Applications** – Flammability, thermal characteristics and combustion mechanisms of fibres, prevention of combustion – Flame retardant fibres suitable for protective clothing – Chemical modifications to make textile materials flame retardant.

IV) **Filtration Application** – Introduction – dust filtration – (Fabric construction – Finishing Treatments) Solid-liquid separation, liquid – liquid filteration.

V) **Medical Textiles** – Introduction – Non inplantable materials, Extra corporeal devices – Inplantable materials - Health care / hygiene products.

VI) **Textile Reinforced Composite Materials** – Introduction to composite materials – Textile reinforcement – Woven fabric reinforced composites – Knitted reinforcement – Braided reinforcement – Stiched fabrics.

VII) **Textiles in Transportation** – Introduction, Textiles in passenger cars – Textiles in other road vehicles – Rail applications – Textiles in Air crafts – Marine application.

VIII) **Textiles in Defense** – Introduction, Historical Background – Criteria for modern military textiles materials – various application of Textiles in various areas of defence such as environmental protection, thermal insulation, water proof/water vapour permeable materials – ballistic protection – heat protection – biological and chemical warfare protection, High altitude fabrics, etc.

IX) Review of Geo technical application of Textiles

X) **Miscellaneous Applications** – Electrical insulation – Battery separators – paper makers felt – synthetic turf and sports application – bearing and sealing materials –

civil engineering Applications – sound insulation – structural application – power transmission – parachute textiles – ropes, cordage and twines.

XI) **Narrow fabric production methods** - Application in Technical Textiles.

XII) Testing of Technical Textiles.

Reference Books

1) Hand book of Technical Textiles Edited by A.R. Horrocks & S.C. Anand. Woodhead Publication. Ltd. England.
2) Wellington Seass Handbook of Industrial Textiles by Sabit Adanur, Technomic Publication Co. Lancaster.
3) Electrostatic Charging of Textiles, Textile Progress Vol.28, No.1 BY I. Holme, The Textile Institute Publication.
4) High Performance Fibres, Textile Progress, Vol.25, No.3/4, By S.K. Mukhopadhyay, Textile Institute Publication.
5) Medical Textiles 96, Conference Proceeding, by Bolton UK, Woodhead Publication Ltd.,
6) The Production & Properties of Narrow Fabrics, Textile Progress, Vol.8, No.4, By – J.P. Turner, The Textile Institute Publication.
7) Protective Clothing, Textile Progress, Vol.22, No.2/3/4, By P.W. Harrison, The Textile Institute Publication.
8) Needle Punching by A.T. Purdy The Textile Institute Publication.
9) Barrier Fabrics for Protection Against Aerosols' The Textile Progress, Vol. 26, No.1, By S.M. Maini, The Textile Inst. Publication.
10) Automotive Textiles, Textile Progress, Vol.29, No.1/2 by S.K. Mukhopadhyay & J.F. Partridge, The Textile Inst. Publication.
11) The Thermal Insulation Properties of Fabrics Textile Progress, Vol.24, No.4, J.O. Ukponmwan, The Textile Inst. Publication.
12) Thermal Bonding of Non woven fabrics, Textile Progress, Vol.26, No.2, The Textile Inst. Publication
13) Industrial Application of Textile : Textiles for Filtration and Coated fabrics Textile Progress, Vol.14, No.1, By Pushpa Bajaj & A.K. Sengupta, The Textile Inst. Publication.
14) Developments in Non-woven fabrics Textile Progress Vol.12by A.T. Purdy, Textile Institute Publication.
15) Journal of The Textile Institute Vol.81, No.4 By P.W. Harrison, The Textile Inst. Publication

16) TIWC-96 Niches in the world of Textile Vol, World Conference by TTI, The textile institute publication.
17) Industrial Application of Textiles by K.L. Floyd, Textile Progress Vol.6 No.2 The Textile Institute Publication.
18) Medical Textile – International Conference, Bolton UK.

FINAL YEAR B. TEXT - SEMESTER-II

8.5 FASHION TECHNOLOGY IN APPARELS & MADE-UPS (TT/MMTT/TPE/TC) (ELECTIVE-II)

Lectures	:	3 Hrs / Week
Theory Paper	:	100 Marks
Subject Total	:	100 Marks

I) **Fashion:** Fashion terminology, Origin of fashion, Fashion cycle, Fashion industry, factors affecting fashion, Fashion adaptation theories. Major fashion centers of the world: Brief introduction to world fashion centers- American, European, Japanese and Indian; Fashion houses and designers. Fashion designing, apparel designing and fashion technology.

II) Design: Elements and principles of design: Line, colour and proportion emphasis. Design process: Designers' functions -Inspiration files, sketches, how to interpret designs, story Board / Fabric story; The design studio, sampling.

III) Fashion Theories – Fashion of direct eras. French revolutions.

IV) Psychology of clothing – first impression, role of socio – psychological and economical aspects of clothing.

V) Retailing: Various types of retailers, Franchise retailing, garment retailing, private labels and others, department stores, specialty stores, chain retailers, mail order houses, shopping malls. Designer labels Vs Brands, Analysis of designer’s labels. Licensing and franchising.

VI) Fashion information services: Trend forecasting and auxiliary services. Forecasting trends: Purpose of forecasting trends, how to use forecasting services. Fashion promotion and communications: Trade fairs, Fashion shows.

VII) Definition of merchandising - functions of merchandising division - Role and responsibilities of a merchandiser- different types of buyers - Communications with the buyers - awareness of current market trends – product development - line planning line presentation.

VIII) Anatomy for designers, Human proportion and figure constructions. Head the unit of measurement, methods of determining individual proportions,

Basic drawing of the fashion figure – flat sketching, average proportions methods of determining standards of women's figure.

IX) Drawing the lay figures – Three quarter view of lay figure – proportions of the figure measuring eight heads. Sketching and illustrations of body figures & body shapes.

X) Introduction to historic costumes. Introduction to fashion accessories, history, classification and recent trends. Use of leather in apparel.

XI) Computer application in fashion designing.

Reference Books

1) Elements of fashion and apparel design by Sumathi G.J.
2) Fashion design and product development by Harold Carrl John Pomeror.
3) Instructing fashion by Kathryn Mckelvey and Janine Munsbw.
4) "Art in Every day life" Calcutta - IBH Pub. Co. by Gold Stein & Gold Stein (1972)
5) "Inside Fashion Design" by Tate (1977) Sharon Lee.
6) Clothing of models by Erain Mabel.
7) Michael P. Grover & Computer Aided Design & Manufacturing.
8) Brockman, H.L., " The theory of Fashion ", John Wiley & Sons, (1965).
9) Kawashima, Masazki, " Fundamentals of Men's Fashion Design ", Fairchilds publications (1976).
10) Jarnow, J.A., and Judelle B., " Inside the Fashion Business ", JWS (1974) 2nd edition.
11) Barton, Roger " Advertising Handbook ", Prentice Hall Inc (1956).
12) Swinney, John B, " Merchandising of Fashion ", Ronald press (1942).
13) Jacob Solinger., " Apparel Manufacturing Handbook ", VanNostrand Reinhold Company (1980).

FINAL YEAR B. TEXT - SEMESTER-II

8.5 HOME TEXTILES (TT/MMTT) (ELECTIVE-II)

Lectures	:	3 Hrs / Week
Theory Paper	:	100 Marks
Subject Total	:	100 Marks

I) **Textile for seating** – Upholstery fabrics for domestic applications – scope, fixed upholstery, non-stretch loose covers, stretch covers. Upholstery fabrics for contract use – general, automotive applications, Commercial applications.

II) **Window Textiles** – Sun filters (Sheers and nets), Semi-sheers, Reflective textiles, curtain fabrics & drapes, Blinds.

III) **Bed Textiles** – Sheets & Pillow Cases, Quilted Textile, Blankets & Rugs - Jacquard blankets, Printed blankets, Fire proof blankets, Baby blankets. Bed Spreads, Mattress covers, (Ticking)

IV) **Fabrics for Wall Covering, Textile Art** – Tapestries, Wall hangings, Textiles for screens & Room Dividers.

V) **Bathroom Textiles** - General shower curtains, Terry Toweling.

VI) **Accessories** – Scatter Cushions, Floor Cushions, Lampshade fabrics.

VII) **Table Textiles** – Tablecloths – Colour – Woven & Printed type, jacquard types, embroidered types, non-woven types. Table mats – Colour -woven, Printed jacquard, embroidered.

VIII) **Textile Floor Coverings** – Introduction, Pile Fibres, Backing fibres & fabrics – Tufted carpets, Needle felt backings, woven carpet. Woven Carpet Manufacture – Wilton weaving, shedding mechanism, Aximinster. Tufted Carpet Manufacture – Broadloom machinery, Hand tufting, Ancillary equipments Needle felt Manufacture – Needling machinery, textured & patterned needle felts, thermo-bonded products. Unconventional methods for making carpets – Bonding, knitted carpet, stitch bonding, flocking.

IX) **Towels** :- Types of towels, Bath robes, Beech Towels, Kitchen Towels, Terry towels, Napkins - Construction, weave, pile height, patterning, production, dyeing, finishing, etc.

X) **Velour** - Types of velvets – Jacquard, Dobby, Plain, Printed – Manufacture & construction. Methods of velour making by cutting and shearing.

XI) **Kitchen Textiles** :-Aprons, Dish cloth, Teacosy, Bread bag, Mittens, Pot Holders, Table Mats – Construction & manufacturing details.

XII) **General**: - Hand / machine embroidered scarves, stoles, shawls,Madeups used in hospitals, etc. Textiles care labeling & Design aids.

Reference Books

1) Carpets : Back to Front, Textile Progress, Vol.19, No.3 by – L Cegielka MA, The Textile Inst. Publication
2) Textile Floor coverings by G.H. Crawshaw, Textile Progress, Vol.9, No.2, The Textile Inst. Publisher.
3) Interior Furnishings', Textile Progress, Vol.11, No.1, By Mortimer O.Shea, The Textile Inst. Publication
4) Interior Furnishing by Mortimer O.Shea, Textile Progress, Vol.11, No.1, The Textile Institute, Publication.
5) Textile Floor covering by G.H. Crawshaw, Textile Progress Vol.9, No.2, The Textile Institute, Publication

FINAL YEAR B. TEXT - SEMESTER-II

8.5 NON-WOVENS & GEO-TEXTILES (TT/MMTT) (ELECTIVE-II)

Lectures	:	3 Hrs / Week
Theory Paper	:	100 Marks
Subject Total	:	100 Marks

I) Historical background of nonwoven, non woven definition INDA & EDANA, Non woven manufacturing process, web making process

II) Dry process including carding, Garnetting & air laid, wet process, polymer extrusion.

III) **Web bonding process** – chemical bonding, thermal bonding, mechanical bonding, spun bonding.

IV) **Classification of nonwoven** – On the basis of use, on the basis of manufacturing process, on the basis of web formation, on the basis of bonding.

V) **Dry laid webs** – fibre selection, fibre preparation, web formation, layering, Wet laid nonwoven – Raw materials, production process, special features of the wet laid process and its product. Spun laced webs – choice of fibre.

VI) **Mechanical bonded webs** – needle punched nonwovens, Application of needle punching, stitch bonded nonwoven – manufacturing process, applications.

VII) **Hydro entangled nonwovens** – Bonding process, water system, filtration system, web drying, properties of spun laced webs, applications.

VIII) **Chemical bonded nonwoven** – Latex binder, other types of nonwoven binders, formulation, order of formulation, bonding technology – saturation, foam bonding, spray bonding, print bonding, powder bonding, application of chemical bonded nonwoven.

IX) **Thermal bonded nonwovens** – binder, binding fibres, binding powder, binding webs, methods of thermal bonding – Hot calendering, belt calendering, oven bonding, ultrasonic bonding, radiant heat bonding.

X) Melt blown nonwovens

XI) Economics of nonwovens

XII) Nonwovens for Geotextiles.

XIII) Overview of geo textiles, types of geo textile, development of Geo textiles, functions of Geo textiles.

XIV) Raw materials used fibre properties for geo textiles, production of Geo textiles. Such as wovens, non-wovens, knitted, grids, mats, ties, cellular Geo textiles, webs,

stripes, bio degradable geo textiles, and their properties for different functions and test methods.

XV) Types of soils, their characteristics, testing of soil.

XVI) Filtration and erosion control application. Principles, Erosion control for inland waterways, coastal erosion protection, scour protection, rain fall erosion control.

XVII) Drainage application: structural drainage, fin drains, land drainage etc.

XVIII) Separation application: Unpaved Road, Paved road, Railways.

XIX) Soil Reinforcement application. Steep faced embankment, slope stabilization, Retaining walls, Geo Textiles pile capping.

XX) Growth of Geo textiles, potential of geo textiles in India.

XXI) Durability and creep: Soil induced degradation, chemical pollution, Temperature resistance, sunlight degradation, stress relaxation.

Reference Books

1. Nonwoven Process Performance & Testing – Turbak
2. Nonwoven Fabric Construction Synthetic Fibres – Jan-Mar 2007.
3. Proceedings of the Seminar - Nonwoven Technology Market & Product Potential, IIT, New Delhi December 2006.
4. Geo Textile by NWM John.
5. Geo synthetics world by J. N. Mandal.
6. Designing with Geo synthetics by R. M. Koerner.
7. Periodicals on Non Woven & Geo Textiles.

FINAL YEAR B. TEXT - SEMESTER-II

8.5 MAINTENANCE MANAGEMENT IN TEXTILE (ELECTIVE-II) (TT/MMTT)

Lectures	:	3 Hrs / Week
Theory Paper	:	100 Marks
Subject Total	:	100 Marks

I) Management - Basic concept of maintenance management, its role in profitability of company, planned maintenance and breakdown maintenance & economic aspects-sub classes of planned maintenance, Mechanism of planned maintenance, optimum planned maintenance, Computer applications in maintenance management.

II) Maintenance of spinning preparatory machines, schedules, precautions & methods to be followed during maintenance activities, tools & gauges used for maintenance.

III) Maintenance of Ringframe & Rotor Spinning Machine - schedules, staff, precautions & methods to be followed, Tools & gauges used. Study of aprons & cots used in spinning & their maintenance

IV) Machine audit – concept and auditing of spinning machines.
Energy conservation in spinning

V) SQC synchronization with maintenance – SQC activities useful for maintenance in various departments of spinning.

VI) Basic concept of lubrication, types of lubricants used for textile machines, Lubricant storage, handling, and precautions. Essential properties of lubricants for various frictional behaviour.

VII) Maintenance of weaving preparatory machines, schedules, critical points of maintenance, precautions to be taken during maintenance operations.

VIII) Maintenance of plain & auto loom - Schedules, critical points, precautions, auditing of plain & auto loom.

IX) Maintenance of shuttleless weaving machines. Approach towards maintenance of latest weaving machines, Critical maintenance points of various shuttleless weaving machines.

X) Recording of maintenance activities & its importance.

XI) Concept of on line lubrication and cleaning.

Reference Books

1) Maintenance manuals by BTRA for various spinning & weaving machines.
2) BTRA monograph series.
3) Spinning machinery maintenance by SITRA
4) Maintenance manuals of different machinery manufacturers of spinning & weaving machines.

FINAL YEAR B. TEXT - SEMESTER-II

8.5 ORGANIZATIONAL BEHAVIOUR AND HUMANITIES (TT/MMTT/TPE/TC) (ELECTIVE-II)

Lectures	:	3 Hrs / Week
Theory Paper	:	100 Marks
Subject Total	:	100 Marks

I) **Fundamentals of Organizational Behaviour** – The dynamics of people organizations – Models of organizational behaviour – Managing communications – Social systems and organizational culture – Political institution – Society and the state.

II) **Motivation and Reward Systems** – Motivation – Appraising and rewording performance.

III) **Leadership and Empowerment- Leadership** – Empowerment and participation.

IV) **Individual and Interpersonal Behaviour** – Employee attitudes and their effects – Issues between organizations and individuals – Interpersonal behaviour

V) **Group Behaviour** – Informal & formal groups – Teams and team building

VI) **Change and its Effects** – Managing change – Stress and counseling.

VII) **Emerging Aspects of Organizational Behaviour** – Organizational behaviour across cultures.

VIII) **Professional and Business Ethics** – Concept of professional / professionalism – Concept of ethics – Ethics and morals – Business ethics – Professional ethics – Need for professional and business ethics – Importance of ethics – Need for business to be ethical – Ethical dilemmas – Ethical problems in business – Ethics issues – How to make business ethical – Codes of business and professional ethics – Chief provisions of a professional code – Ethics training programs – Communicating ethical values – Role of professional bodies.

IX) **Business & Environment**- Meaning of business – Earlier business objectives – Changing concept and objectives of business – Professionalization – Business ethics – Social responsibility of business – The Indian situation – Meaning of environment – Business firm & its environment – Relationship between business firm and its capital environment – Constituents of business environment – Suppliers – Customers – Competitors – Public – Marketing intermediaries –

Economic environment – Technological environment – Political environment – Social environment – Legal environment

X) **Union and Industrial Labour Relations** – Introduction – Trade unions – Industrial disputes – Strikes – Lock out – Picketing – Gherao – Settlement of industrial disputes – Collective bargaining – Handling of worker's grievances and grievance procedure – Worker's participation in management – Union management relations.

XI) **Industrial Labour Legislation** – Introduction – Importance and necessity of labour acts – Principles of labour legislation – Types of labour laws – The factories act 1948 – The payment of wages act 1936 – The minimum wages act 1948 – The workmen's compensation act 1923 – The industrial dispute act 1947 – The employee's state insurance act 1948

Reference Books

1. Organizational Behaviour – Human Behaviour at Work by J. W. Newstrom & Keitn Davis – Tata Mcgraw – Hill Publishing Company Limited – New Delhi.
2. Industrial Engineering and Management by O. P. Khanna & A. Surup – Dhanpat Rai Publications (P) Ltd., New Delhi
3. Industrial Organization and Engineering Economics by S. C. Sharma and T. R. Banga – Khanna Publishers – New Delhi 110 006
4. Strategic Management and Business Policy by T. L. Wheelen and J. D. Hunger – Addison Wesley, of Addison Wesley Longmen
5. Managing Recruitment Training and Development by Elizabeth M Christopher and Larry E. Smith – Viva Books Pvt. Ltd., - New Delhi – Madras.
6. Target Setting and Goal Achievement – A practical guide for managers by Richard Hale and Peter Whitlam – Kogan Page India Pvt Ltd., 4325/3, Ansari Road, Daryaganj, New Delhi 110 002
7. Basic Managerial Skill for All by E. H. Mcgrath, S. J. Prentice – Hall of India – New Delhi
8. How to Manage Organizational Change – The Sunday times – by D. E. Hussey – Kogan page India Pvt. Ltd., - Daryaganj, New Delhi – 100 002
9. Performance Appraisals – A critical view edited by Sumati Reddy – The ICFAI University press, 52, Nagarjuna Hills, Punjagatta, Hyderabad, India 500 082
10. Management in New Age – Western windows eastern Doors by Subhash Sharma – New age International (P) Ltd., Publishers – New Delhi, Bangalore etc.

FINAL YEAR B. TEXT - SEMESTER-II

8.6 SEMINAR-II (TT/MMTT/TPE/TC)

Lectures	:	2 Hrs / Week
Term Work	:	50 Marks
Subject Total	:	50 Marks

Topic -

In the beginning of the semester, every student individually will be assigned a seminar topic in the emerging / perspective field in the area of textiles such as Spinning, Weaving, Fibres, Testing, Chemical processing and alike.

Seminar Preparation and Presentation -

Students will collect the information on the above subjects and submit the report both soft and hard copy on the dates specified by the concerned faculty. The seminar report will be of minimum 15 pages. The spacing between the lines will be 1.5. The font size will be 12 point with New Times Roman. The list of reference must be given at the end of seminar report. The list of reference should be written as per the Textile Research Journal format.

Term Work Marks –

Seminar Report	-	25 Marks
Presentation	-	25 Marks

FINAL YEAR B. TEXT - SEMESTER-II

8.7 DISSERTATION (TT/MMTT/TPE/TC)

Practical	:	6 Hrs / Week
Term Work	:	50 Marks
Oral	:	100 Marks
Subject Total	:	150 Marks

OBJECTIVE:-

To provide an opportunity to students to work on any topic / problem/ experiment selected by them and to encourage them to think independently. Students are assigned dissertations. Project may be taken up by an individual or a group.

TOPICS: - Project work shall be based on any of the following topics.

1) Fabrication of equipments / gadget.
2) Manufacturing of products, its testing and analysis.
3) Extensive survey of industrial practices.
4) A work on industrial problems and finding out remedial measures.
5) Experimental verification on principles used in textiles.
6) Extensive numerical analysis of some problem may be carried out using computer.

FORMAT OF THE PROJECT REPORT

The project report should be typed with 1.5 spacing on demi – size bond paper and in neatly bound form. The total number of typed pages should not be more than 70 and not less than 25. The project report should be written in the following format.

1) Title Sheet
2) Certificate
3) Acknowledgement
4) Content
5) Abstract
6) Introduction
7) Literature survey
8) Design of Experiment / Plan of Work.
9) Observations / Results.
10) Discussion of results and conclusion

11) References: These references should be given in the standard format as that of international technical journals.

12) Annexures, apparatus, etc if any.

Two copies of report should be submitted to the institute / department and one copy should remain with every student of the group.

Assessment of Dissertation Work:-

Term work of 50 marks are assigned for dissertation work. A dissertation committee will observe the progress of the work by arranging two progress reviews and based on the performance the term work marks will be assigned.

Oral Examination:-

One internal and one external examiner from industry / research organization / academia in each of the spinning, weaving & processing disciplines will be conducting oral examination.