### Department of Textile Technology

**SGGS Institute of Engineering & Technology Vishnupuri, Nanded**

**Curriculum of M. Tech. (Textile Technology)**

For 2016-17 Admission

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Sr. No.</th>
<th>Title of the Course</th>
<th>Credits</th>
<th>Lecture-Tutorial-Practical/Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTT 501</td>
<td>1</td>
<td>Advanced yarn production</td>
<td>03</td>
<td>(3-0-0)</td>
</tr>
<tr>
<td>TTT 502</td>
<td>2</td>
<td>Research methodology &amp; statistical analysis</td>
<td>03</td>
<td>(3-0-0)</td>
</tr>
<tr>
<td>TTT 511</td>
<td>3</td>
<td>Electives (Choose any two)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TTT 512</td>
<td>i.</td>
<td>Technical textile</td>
<td>03</td>
<td>(3-0-0)</td>
</tr>
<tr>
<td>TTT 513</td>
<td>ii.</td>
<td>Industrial engineering &amp; management</td>
<td>03</td>
<td>(3-0-0)</td>
</tr>
<tr>
<td>TTT 514</td>
<td>iii.</td>
<td>Knitting &amp; nonwovens</td>
<td>03</td>
<td>(3-0-0)</td>
</tr>
<tr>
<td>TTT 515</td>
<td>iv.</td>
<td>Structure &amp; mechanical properties of Textiles</td>
<td>03</td>
<td>(3-0-0)</td>
</tr>
<tr>
<td>TTT 503</td>
<td>4</td>
<td>Industry Laboratory Practice I</td>
<td>03</td>
<td>(0-0-6)</td>
</tr>
<tr>
<td>TTT 504</td>
<td>5</td>
<td>Seminar I</td>
<td>02</td>
<td>(0-0-2)</td>
</tr>
<tr>
<td>TTT 505</td>
<td>6</td>
<td>Case study I</td>
<td>03</td>
<td>(0-0-6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Sub Total</strong></td>
<td>20</td>
<td>(12-0-14)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Semester I</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Sr. No.</th>
<th>Title of the Course</th>
<th>Credits</th>
<th>Lecture-Tutorial-Practical/Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTT 521</td>
<td>1</td>
<td>Modern Weaving Technology</td>
<td>03</td>
<td>(3-0-0)</td>
</tr>
<tr>
<td>TTT 522</td>
<td>2</td>
<td>Project Management &amp; Finance</td>
<td>03</td>
<td>(3-0-0)</td>
</tr>
<tr>
<td>TTT 531</td>
<td>3</td>
<td>Elective II (Choose any two)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TTT 532</td>
<td>i.</td>
<td>Geotextile &amp; Engineering</td>
<td>03</td>
<td>(3-0-0)</td>
</tr>
<tr>
<td>TTT 533</td>
<td>ii.</td>
<td>Advanced textile wet processing</td>
<td>03</td>
<td>(3-0-0)</td>
</tr>
<tr>
<td>TTT 534</td>
<td>iii.</td>
<td>Garment technology &amp; merchandising</td>
<td></td>
<td>(3-0-0)</td>
</tr>
<tr>
<td>TTT 535</td>
<td>iv.</td>
<td>Advanced Textile Testing</td>
<td>03</td>
<td>(3-0-0)</td>
</tr>
<tr>
<td>TTT 523</td>
<td>4</td>
<td>Industry Laboratory Practice II</td>
<td>03</td>
<td>(0-0-6)</td>
</tr>
<tr>
<td>TTT 524</td>
<td>5</td>
<td>Seminar II</td>
<td>02</td>
<td>(0-0-2)</td>
</tr>
<tr>
<td>TTT 525</td>
<td>6</td>
<td>Case study II</td>
<td>03</td>
<td>(0-0-6)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Sub Total</strong></td>
<td>20</td>
<td>(12-0-14)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Semester II</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Sr. No.</th>
<th>Title of the Course</th>
<th>Credits</th>
<th>Lecture-Tutorial-Practical/Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTT 541</td>
<td>1</td>
<td>Dissertation Part I</td>
<td>16</td>
<td>(0-0-16)</td>
</tr>
<tr>
<td>TTT 542</td>
<td>2</td>
<td>Seminar III</td>
<td>02</td>
<td>(0-0-2)</td>
</tr>
<tr>
<td>TTT 543</td>
<td>3</td>
<td>Comprehensive Viva</td>
<td>02</td>
<td>(0-2-0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Sub total</strong></td>
<td>20</td>
<td>(0-2-18)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Semester III</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Sr. No.</th>
<th>Title of the Course</th>
<th>Credits</th>
<th>Lecture-Tutorial-Practical/Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>TTT 551</td>
<td>1</td>
<td>Dissertation Part - II</td>
<td>20</td>
<td>(0-0-20)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Total (Sem I,II,III,IV)</strong></td>
<td>80</td>
<td>(24-2-66)</td>
</tr>
</tbody>
</table>

M. Tech. Textile Technology

2016-17
SEMESTER I

TTT 501: Advanced in Yarn Production
(L3-T0-P0): 3 Credits

**Spinning Preparations:** Fibre mixing and blending practices in industry, Bale Management, Blending Performance Evaluation – Degree of Mixing, Index of Blend Irregularity, Hamburger model- yarn tenacity prediction from fibre properties, Evaluation of blow room performances and AFIS applications

Fibre separation in carding, Design and actions of wire points in carding, Transfer efficiency in carding, Roller drafting, Irregularity in textile strands, Limit irregularity, Index of irregularity, Causes of generation of irregularities, Hook removal in drawframe, Autolevellers in carding/drawframe, Details of combing preparation, Process parameters in speedframe and roving quality

**Ringframe:** Twisting and winding process in ring spinning, Yarn tension in spinning balloon and its effect on yarn quality, Mass variation in ring spun yarns- basics, causes, measurements and detections

**Rotor Spinning:** Productivity- Charka, Ring and Rotor spinning, Fibre properties and yarn quality, Yarn tension in rotor spinning, Process and machine parameters and yarn properties

**Air-Jet Spinning:** Twisting and yarn formation, Process and machine parameters and yarn properties, Yarn structure and properties

**Friction Spinning:** Mechanism of yarn formation, Production of multi-layer and multi-component yarns by friction spinning, Yarn structure and property relation

**References Books:**

1. Spinning of Manmades and Blends on Cotton System, **K. R. Salhotra**
3. The Technology of Short Staple Spinning, (Short Staple Spinning Series, Vol.-I), **W. Klein**
5. A Practical Guide to Combing and Drawing, Vol.-3 (The Textile Institute), W. Klein
8. Fundamentals of Spun Yarn Technology (CRC Press), Carl A. Lawrence
10. Open-end Spinning (Elsevier Science), V. Rohlena
12. Rotor Spinning (The Textile Institute, Manchester), C. A. Lawrence and K. Z. Chen
TTT 502: Research Methodology & Statistical analysis,
(L3-T0-P0): 3 Credits

Part 1: Introduction, overview of research methodology, criteria of good research, motivation in research, types of research, research methods vs methodology, literature survey, defining the research problem, research design, sampling design, measurement & scaling techniques, methods of data collection and presentation, preparation and presentation of research proposal, interpretation & report writing.

Part 2: Processing & analysis of data, statistics in research, measures of central tendency, dispersion, regression analysis, sampling fundamentals, defining & testing of hypotheses, analysis of variance

Part 3: Role of computer in research, study of software such SPSS, DEA, Design of experiment, & STATA etc., LATEX-DTP for thesis writing, research funding & e-resources, writing of good research papers.

References book:

1. Research methodology: methods & techniques- C R Kothari, New age inetrmaional publishers
2. Practical statistics for the Textile industry Part I & II- GAV Leaf, The Textile institute
3. Basic econometrics: Damodar N Gujarati, TATA Mc GRAW Hill

ELECTIVES

TTT 511: Technical Textile
(L3-T0-P0): 3 Credit

Introduction, types of technical yarn, yarn characteristics: monofilament, multifilament, intermingled yarn, tape yarn, core spun yarn-Non elastic core and elastic core, plied/ folded yarn, cabled yarn, braided yarn.
Tape yarn production technique, fibrillated tape yarns. Filament wrapped yarns..
Properties and performance of technical yarns.
Textile Coating & Laminating: Coating materials, coating polymers such as PVC, PVDC, PU,PTFE, Acrylic polymers, rubber and its derivatives, EVA, CARBON NANO TUBES.
Principles of coating, aqueous coating, hot melting coating, metal coating, plaiting, plasma treatment. Different methods of coating.
Novel technical textile yarns: Introduction, reflective yarns, classification, manufacturing process.
UV protected yarn, preparation of UV protection yarn, metallic and metalloplastic yarns, manufacturing techniques. Antimicrobial yarns, treatments, durable antimicrobial fibre/yarn.
Yarns for specific purpose. Anti static yarn, anti stress yarn, anti allergic yarn, soluble yarn.

M. Tech. Textile Technology
2016-17
Electro conductive yarns, manufacturing process, Measurements, EMSE, applications
High modules yarns such as Glass, Carbon, Ceramic, Basalt fibers, HPPE fibres, their properties and uses.
Shape memory polymer yarns, manufacturing process, applications.
Plasma treated yarns for biomedical applications. Chemistry of plasma processing.
Industrial sewing threads, structure of sewing threads, thread finishing, yarn numbering. Threads for very high temperature.
Surgical threads, classifications, manufacturing process, characterization

References Books:

2. R. Alagiruswami and A. Das, Technical Textile yarns, The Textile Institute, Wood Head Publication Ltd., 2010

TTT 512: Industrial Engineering and Management
(L3-T0-P0): 3 Credits

Introduction to Work Study: Definition: Purpose of study, objectives, brief history and evolution, work study and productivity, human factor in application of work study, scope, applications, relationship, between Productivity & standard of living, basic work content, excess work content Management, techniques to reduce excess work content due to product process and ineffective time in control of workers and Management.

Ergonomics: Introduction, Principles, Work system design, Man-machine system, Human behaviour and equipment design, Tools, Techniques and applications, Effect of environment on performance of worker, working conditions, prevention accidents and hazards, lighting, ventilation etc.

Method Study: Definition, Concept, Objectives and Procedure of method study, Flow and handling of materials; Process chart symbols, recording techniques like Flow process charts, Operation, Flow and Two handed Process charts, Flow diagram, String diagram, Multiple
Activity chart, travel chart, Operation Analysis, Analysis of motion, analysis and critical examination of existing methods and development of improved methods, Motion economy, Design of work place layout, Therbligs, SIMO chart.

**Work Measurement:** Definition, significance of work measurement; origin, development and procedure of work measurement, introduction to various work measurement techniques.

Time Study and Other Works Measurement Techniques: Time study: definition, equipment for basic time study, time study forms and other equipment. Steps in use of techniques of time study; selecting the job, breaking the job into elements, approach to the worker, the elements, timing each element, Maynard Operation Sequencing Technique (MOST). Average and qualified worker, rating procedures, criteria affecting the choice of rating procedures, criteria affecting the choice of rating procedures, continuous timing, fly back timing, accumulative timing; standard ratings, comparison of observed and standard ratings, factors affecting the rate of working, scales of rating, rating factors, recording the rating, summarizing the study, allowances, calculation and application of allowances.

Work sampling and production studies; General study of standard data & PTS.

**Quality management:**

Quality as a Corporate Strategy, What is Quality?, New Quality Concepts, Quality Circles, Kaizen, Contributions of Quality Management scientists- Dr. Deming, Crosby, Dr. Armond V. Feigenbaum, Dr. Ishikawa- Seven tools of quality management. Total Quality Management, Roadmap for TQM, Implementation of TQM, Six Sigma, Five ‘S’ , TIMWOOD 7-Seven Wastes, ERP etc.

Term Work: Minimum Four assignments based on the above syllabus.

**Reference Books:**

1. Introduction to work study - ILO
4. Hand Book of Industrial Engineering - Irson& Grant.
7. Testing and quality management by DR. V. K. Kothari

M. Tech. Textile Technology
2016-17
TT 513 : Knitting and Nonwovens  
(L3-T0-P0): 3 Credits


Reference Books:  
1. Fundamentals & advances in Knitting Technology- S C Ray, WPI  
2. Knitting: http://nptel.ac.in/courses/116102008/  
3. Knitting Technology by David J. Spencer, WPI  
5. Nonwovens: http://nptel.ac.in/courses/116102014/  
6. Needle Punching by A.T. Purdy, The Textile Institute, Manchester  
7. Non-woven Bonded Fabrics by J. Lunenschloss, Ellis HORWOOD Limited  

TTT 514 : Structural and mechanical properties of textiles  
(L3-T0-P0): 3 Credits

TTT 515 : Melt spinning & texturising  
(L3-T0-P0): 3 Credits

Introduction, melt spinning concepts of polyester, polypropylene, Nylon, spinning of LOY, POY, FDY, BCF

Flow chart & various components of a melt spinning line, functions and design of the extruder, manifold, dynamic mixer, spinning beam, metering pump, melt filters, spinning pack, spinneret, types, design & role of quench chamber, spin finish applicator, winder, dryer, spin finish pump, intermingling device, Drawing & heat setting.

Raw material, types of chips, storage & conveying of chips, Chips properties, dew point, melt spinning line parameters & their controls, quench air parameters, winding parameters & calculations, testing & properties of raw materials & filament yarn, packaging of spools, norms for gradation, problems & remedial action during process, burn-out section, spin finish oil preparation, auto control systems, oil heating systems, Air treatment plant

Procedure for starting up of line, mounting & removal of spinning pumps, spin packs,

Post spinning processes: texturising, types, basic principles of draw & air jet texturising, yarn processing on texturising machine, processing parameters, yarn properties, problems & remedial actions during texturising, comparative study of texturising machines, modern developments, texturising for fancy yarn production. Modern developments in twisting & rewinding.

Reference book:
1. Manufactured fibre technology, V B Gupta & V K Kothari, Chapman & Hall
2. http://nptel.ac.in/courses/
3. Winter School on Manmade Fibres Vol-I; Edited By Gupta & Kothari; 1988, IITD
4. Winter School on Manmade Fibres Vol-II; Edited By Gupta & Kothari;
8. A Guide to Crimping/Texturising Technology by MANTRA, Surat
TTT 503 : Industry Laboratory Practice I  
(L--T—P 06): 03 Credits  
Students can choose interested area in the field of fiber, yarn, fabric and garment technology. Students have to select any industry, related to area of their convenience. The syllabus of practical’s shall be formed in consultation with subject co-coordinator & industry expert and finally take the approval from the department. Student should perform all practical’s in the industry. At the end of the semester, they have to submit the report, attendance and industry certificate. Internal and external evaluation will be done as per the rules.

TT 504 : Seminar - I  
(L--T—P 02): 02 Credits  
Seminar-I should be based on the literature survey on any topic relevant to textile technology. Each student has to prepare a write up of about 20 pages of “A4” size sheets and submit it in duplicate as the term work. The student has to deliver a seminar talk in front of the faculty members of the department during mid semester & end term. The faculty members based on the quality of the work and preparation and understanding of the candidate, shall do an assessment of the seminar internally – jointly.

TT 505 : Case Study – I  
(L--T--P06): 03 Credits  
Case Study – I should be based on the topics relevant to textile technology in the field of fiber, yarn, fabric, garment technology and management related to area of their convenience. Product development, trouble suiting problems, best practices of the organization can be studied as a case study. The case study shall be framed in consultation with subject co-coordinator & industry expert and finally take the approval from the department. Each student has to prepare a write up 25-30 pages on “A4” size sheets and submit it in duplicate as the term work. The faculty members based on the quality of the work and preparation and understanding of the candidate, shall do an assessment of the case study internally – jointly.
SEMESTER II

TTT 521 : Modern Weaving Technology

(L3-T0-P0): 3 Credit

Need of modern developments in weaving and its benefits

Modern developments in Winding:


Modern Warping and Sizing:

Concept of modern warping, developments in creel, head stock and different control systems.

Concept of modern sizing, developments in sow box, driving of cylinders and head stock, Development in sizing ingredients and different control systems.

Modern Looms:

Suitability of H.S. weaving machines. Technical aspects, economic aspects, manufacturer and machine related criteria, growth of technology, economics.

Air-Jet Looms:

Principles of weft insertion, weft tensioning, weft length measurement, sley movement, take-up motion. Equation of motion for weft yarn. Air-jet velocity profile, main nozzle, air guides, relay nozzle, weft travel position in air-jet, energy requirements. Method of operation of main jet. The air stream in the main nozzle area and its action on the weft thread.

Improvement jet system. Study on pneumatic weft insertion behaviour in main nozzle. Interaction between air, yarn and guide system to increase the yarn velocity. Advancement of Air-jet looms. Range of applications.

Rapier weaving:

Recent developments, development in filling insertion, picking speed, secure filling transfer, and versatility of Rapier of Rapier gripper. Free flight rapier, light rapier head, electronic filling
tension controller, pre winder switch-off monitoring, filling detection at the end of insertion, pick finding, rapier cleaning devices.

Electronic controls, developments in let-off mechanism and take-up mechanism, selvedges. Efficiency of rapier loom.

**Gripper Projectile Loom:**


**Techno Economics of High Speed weaving:**


**The position of cloth fell under stable weaving conditions:**

The function of take-up motion, the physical aspect of the cloth fell equation, the relation between beat-up force & pick spacing( the inverse distance equation). Bumping conditions, cloth fell equation under bumping condition.

**Reference Books:**

2. Shuttless WVG.Machines- OldrichTalavasek and Vladimir Svaty.
3. Weaving machines, mechanisms management – M.K.Talukdar,
4. High speed weaving-K.Jaychandran at all-PSG College of Technology, Coimbatore
5. SIZING-Materials, Methods, Machines- Ajgaonkar, Talukdar and Wadekar

**TTT 522 : Project Management and Finance**

(L3-T0-P0): 3 Credit

Introduction, Project Management principles, Project Management definition, Project Management perspective, Organisational Structure and Organisational Issues: Introduction, Concept of Organisational Structure, Roles and Responsibilities of Project Leader, Relationship between Project Manager and Line Manager, Leadership Styles for Project Managers, Conflict Resolution, Team Management and Diversity Management, Change management

Project stake holder definition, Project sponsor and Project manager definitions, Project life cycle definition, functional areas of Project Management.

M. Tech, Textile Technology

2016-17


References:


Project Management: A Managerial Approach, Jack Meredith and Samuel


Cost Accounting by Arora

Electives II

TTT 531: Geo-textile & Engineering:
(L3-T0-P0): 3 Credit


Reference Books:
1. Soil Mechanics-B.C.Punmia
2. Non-woven bonded fabrics- J.Lunenschlos, Publisher- Ellis Harwood Series.
3. Designing with Geosynthetics-Robert M.Koerner, Publisher-Prentice Halla, Englewood cliff

TTT 532: ADVANCED TEXTILE WET PROCESSING
(L3-T0-P0): 3Credit

Dyeing Process Developments & Kinetics: Influence of fibre structure on dye uptake; Kinetics of Dyeing; Developments in dyes and dyeing processes for the dyeing of various textile substrates with various dye classes.

Dyeing Machines Developments: Advances in Mass coloration; Advances in cheese dyeing machines. Advances in Beam dyeing; Advances in soft flow dyeing machines, Advances in jet dyeing machines. Developments in jiggers, Continuous dyeing machineries & its developments, Various dyeing defects caused by the above machineries; Garment Dyeing & it’s modern machineries.

Color Measurements: Spectrophotometric color measurement & analysis of dye solutions; Fastness properties of dyed materials and their assessment. Identification of dyes on fibres.
**Pollution & Eco Treatments:** Pollution aspects of textile dyeing; Modern approaches to eco-friendly wet processing of woven and knitted textiles. Eco-friendly dyes and their method of dyeing; Technology and principles of effluent treatment. Advanced color removal technologies, recovery and reuse of water and chemicals.

**Modern Printing:** Principle and working of fully automatic flat bed screen printing machine; Rotary Printing machine; Transfer Printing machine-Digital Printing; Garment Printing machines; Various practical problems & possible remedies in the above printing machineries; Modern developments in textile printing machines/techniques.

**Advances in Finishing:** General overview of the recent technological developments in the area of textile finishing machines/techniques.

**Modern Finishing:** Formaldehyde free finishes; stone wash, Enzyme wash, Bio – polishing, Acid wash, sand blasting, leather finish, rubbery touch, feather touch, easy care finishes, wrinkle free and wrinkle resistant finish, water repellent finish, UV protective garments, Anti – microbial/ anti – bacterial inhibition finish, silicone softeners, fire retardant finishes for garments, functional finishes for garments; Micro- encapsulation and its relevance in textile finishing application.

**Reference Books:**

1. Dyeing & Chemical Technology of Textile Fibres, By: **E. R. Trotman**; Published By: Charles Griffin & Company Ltd.
3. Technology of Textile Printing; By- **R.S.Prayag**; Published By: Mrs. L.R.Prayag, Dharwad, Karnataka State.
5. Technology of Textile Processing – Vol-IV “Technology of Printing" By: **Dr.V.A.Shenai.**; Published By: Sevak Publications, Mumbai.
6. Technology of Textile Processing - Vol.6, "Technology of Dyeing" By: **Dr. V. A. Shenai**; Published By: Sevak Publications, Mumbai.
7. Technology of Textile Processing - Vol.2,"Chemistryof dyes & Principle of dyeing" By: Dr. V. A. Shenai. ; Published By: Sevak Publications, Mumbai.
8. Book of Papers: **Convention on Natural Dyes-Dec-1999**; Published By: IITD.
10. Chemistry & Technology of Fabric Preparation & Finishing, By: Dr. Charles Tomasino, Published By: Dept. Of Textile Engg, Chemistry & Science, College of Textiles, North Carolina State University, North Carolina.
11. Textile Finishing; By: **R.S Prayag**; Published By: Mrs. L.R.Prayag, Dharwad, Karnataka State.
TTT 533 : Garment Technology and Merchandising
(L3-T0-P0): 3 Credits

**Introduction** – Sectors and structure of apparel industry, Overview of Indian garment industry, Nature & scope of apparel manufacturing industry and its developments in recent years.

Sequence of garment manufacturing process. Latest developments in garment technology.

Grading, Types and making of lay plan, Requirements of spreading, types and methods of spreading, spreading equipments and tools, cutting equipments and tools and their modernization, size charts etc.

Technology of Sewing machines, Sewing defects. Fabric sewability, principles of selecting proper stitch and seam types, Effect of stitch type on elasticity and strength, Effect of stitch type on seam slippage. Stitch less garments.

Garment dyeing and finishing, Value added garments. Pressing & finishing: object, classifications, means, components, machinery and equipments, garment finishing and inspection, Quality Standards of some giant retailers, TUV, SGS and ASTM testing standards.

**Production technology:** Manual systems, make through systems, straight line systems, modular production systems, unit production systems, quick response systems.

**Ware housing:** Handling equipments, storage equipments, packing equipments. Application of CAD/CAM in garment manufacturing


**Reference Books:**
1. The Technology of clothing manufacturing by Harold Carr, Barbara Latham, Publisher – Blackwell scientific publications
2. Handbook for designing by Ritu Jindal, S. Malhan, Publisher - Mittal Publications
3. Managing Productivity in the apparel Industry by Rajesh Bheda,Michael T. Fralix, Publisher – CBS publications & distributors
4. The apparel industry in India, Ila Kantilal

M. Tech, Textile Technology
2016-17
6. Fashion Buying, Elain Stone
7. Principles of Fashion Merchandising, Sidney Packard

**TTT 534 : Advanced Textile Testing**

(L3-T0-P0): 3 Credits

1. **Textile Quality Management Overview**: Quality and its importance, ISO system
2. **Fiber Testing**: AFIS - Principle, working and applications, Advantages over HVI
3. **Yarn Testing**: CTT - Principle, working and applications
4. **Fabric Testing**: KES - Principle, working and applications; FAST - Principle, working and applications
6. **IR Spectroscopy**: Principle and its applications for Cotton, Blend Analysis
7. **Testing for UV Protection**: In vitro and In vivo
8. **Labelling**: Woolmark, Care, etc.

**References:**
6. [www.nptel.ac.in](http://www.nptel.ac.in)

**TTT 535 : Textile Composites**

(L3-T0-P0): 3 Credits

1. **Composites**: Definition, Objectives, Classification, Applications
2. **Matrix Materials**: Polymers used, Properties of polymers, Thermoset and thermoplastic resins, Nonpolymeric materials
3. **Fabrication**: Hand lay, Bag molding, Pultrusion, Blow molding, Preformed molding, etc.
4. **Mechanics**: Isostress, isostrain conditions, Critical Fiber Length, Critical Fiber volume, Calculations for stress, strain and modulus; changes for continuous to discontinuous fibers, Failure mechanism

5. **Applications**: For structural engineering, electrical, civil, aerospace, defense, automobile, sports, medicine and others

6. **Surface treatments, Flamability and fire resistance of composites, Laminated composite**

**Reference Books:**

1. Design and Manufacture of Textile Composites, Long C A, Publisher Woodhead Publishing Series in Textiles
2. Composite Materials, K Srinivasan, Publisher Narosa Publishing House, Delhi
5. Composite Material Science & Engineering, Spring Verlag
6. 3D Textile Reinforcements in composite Materials, Antonio Miravete, Publisher Woodhead Publishing Series in Textiles
7. www.nptel.ac.in

**TTT 523: Industry Laboratory Practice II**
(L--T--P06): 03 Credits

Students can choose interested area in the field of fiber, yarn, fabric and garment technology. Students have to select any industry, related to area of their convenience. The syllabus of practical’s shall be formed in consultation with subject co-coordinator & industry expert and finally take the approval from the department. Student should perform all practical’s in the industry. At the end of the semester, they have to submit the report, attendance and industry certificate. Internal and external evaluation will be done as per the rules

**TTT 524 : Seminar - II**
(L--T--P02): 02 Credits

Seminar-I should be based on the literature survey on any topic relevant to textile technology. Each student has to prepare a write up of about 20 pages of “A4” size sheets and submit it in duplicate as the term work. The student has to deliver a seminar talk in front of the faculty members of the department during mid semester & end term. The faculty members based on the
quality of the work and preparation and understanding of the candidate, shall do an assessment of the seminar internally – jointly.

**TTT 525 : Case Study – II**  
*(L-T-P06): 03 Credits*

Case Study – II should be based on the topics relevant to textile technology in the field of fiber, yarn, fabric, garment technology and management related to area of their convenience. Product development, trouble suiting problems, best practices etc. of the organization can be studied as a case study. The case study shall be framed in consultation with subject co-coordinator & industry expert and finally take the approval from the department. Each student has to prepare a write up 25-30 pages on “A4” size sheets and submit it in duplicate as the term work. The faculty members based on the quality of the work and preparation and understanding of the candidate, shall do an assessment of the case study internally – jointly.

**SEMESTER III**

**TTT 541 : Dissertation Part - I**  
*(L-T—P16): 16 Credits*

Candidates will have to undertake research work independently on a topic related to Textile technology and submit a detailed report of the same. He/She will have to defend the work carried out at the Institute practical Examination. He/She will have to submit monthly progress report of the work to the department, till the completion of the project work.

**TTT 542 : Seminar - III**  
*(L-T--P02): 02 Credits*

Seminar-III should be based on the literature survey on any topic related to the project work/textile technology. Each student has to prepare a write up of about 20 pages of “A4” size sheets and submit it in duplicate as the term work. The student has to deliver a seminar talk in front of the faculty members of the department during mid semester & end term. The faculty members based on the quality of the work and preparation and understanding of the candidate, shall do an assessment of the seminar internally – jointly.
TTT 543 : Comprehensive Viva  
(L-T-P02): 02 Credits  
At the end of the third semester there will be oral examination in the presence of an external examiner/ Group of examiners based on the syllabus of subjects of Part-I and Part-II related to the project work. Also it will be based on the Project the candidate will undertake during second year of M.Tech.

SEMESTER IV

TTT 551 : Dissertation Part - II  
(L-T—P20): 20 Credits

Candidates will have to undertake research work independently on a topic related to Textile technology and submit a detailed report of the same. He/She will have to defend the work carried out at the Institute practical Examination. He/She will have to submit monthly progress report of the work to the department, till the completion of the project work.