# Scheme of Teaching and Examination for M.Tech. Textile Technology

**I Semester**

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Name of the Subject</th>
<th>Teaching hours/week</th>
<th>Duration of Exam in Hours</th>
<th>Marks for Total Marks</th>
<th>CREDITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lecture</td>
<td>Practical / Field Work / Assignment/ Tutorials</td>
<td>I.A.</td>
<td>Exam</td>
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<tr>
<td>14JTT11</td>
<td>Advanced Fiber Physics</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>50 100 150</td>
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<tr>
<td>14JTT12</td>
<td>Advanced Knitting and Nonwovens</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>50 100 150</td>
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<tr>
<td>14JTT13</td>
<td>Advanced Wet Processing</td>
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<td>3</td>
<td>50 100 150</td>
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<tr>
<td>14JTT14</td>
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<tr>
<td>14JTT15</td>
<td>Elective-I</td>
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<td>2</td>
<td>3</td>
<td>50 100 150</td>
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<tr>
<td>14JTT16</td>
<td>Lab Component</td>
<td>--</td>
<td>3</td>
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<td>25 50 75</td>
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<td>14JTT17</td>
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<td>16</td>
<td>18</td>
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**Elective – I**

<table>
<thead>
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<tr>
<td>14JTT151</td>
<td>Advanced Mathematics</td>
</tr>
<tr>
<td>14JTT152</td>
<td>Yarn Engineering</td>
</tr>
<tr>
<td>14JTT153</td>
<td>Strategic and Technology Management</td>
</tr>
<tr>
<td>14JTT154</td>
<td>Application of IT in Textiles</td>
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## M.TECH. Textile Technology

### II Semester

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Name of the Subject</th>
<th>Teaching hours/week</th>
<th>Duration of Exam in Hours</th>
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<th>CREDITS</th>
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<tbody>
<tr>
<td>14JTT21</td>
<td>Advanced Textile &amp; Apparel Testing</td>
<td>4 2 3 50 150 4</td>
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<td>14JTT22</td>
<td>Environmental Management for Textile Industry</td>
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<td>14JTT24</td>
<td>Developments in Fabric Formation</td>
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<td>14JTT25</td>
<td>Elective-II</td>
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<td>25 1</td>
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<td><strong>Project Phase-I(6 week Duration)</strong></td>
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<td><strong>Total</strong></td>
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### Elective – II

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<tr>
<td>14JTT251</td>
<td>Human Resource Management</td>
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<tr>
<td>14JTT253</td>
<td>Variability and it’s Control</td>
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</table>

**Between the II Semester and III Semester, after availing a vocation of 2 weeks.
### III Semester: INTERNSHIP

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Subject</th>
<th>No. of Hrs./Week</th>
<th>Duration of the Exam in Hours</th>
<th>Marks for Total Marks</th>
<th>CREDITS</th>
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<tbody>
<tr>
<td>14JTT31</td>
<td>Seminar / Presentation on Internship (After 8 weeks from the date of commencement)</td>
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<td>-</td>
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<tr>
<td>14JTT 32</td>
<td>Report on Internship</td>
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<td>-</td>
<td>75</td>
<td>15</td>
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<tr>
<td>14JTT 33</td>
<td>Evaluation and Viva-voce</td>
<td>-</td>
<td>-</td>
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<td><strong>Total</strong></td>
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<td>-</td>
<td>-</td>
<td>25</td>
<td>150</td>
</tr>
</tbody>
</table>

* The student shall make a midterm presentation of the activities undertaken during the first 8 weeks of internship to a panel comprising Internship Guide, a senior faculty from the department and Head of the Department.
# The College shall facilitate and monitor the student internship program.
   The internship report of each student shall be submitted to the University.
**Between the III Semester and IV Semester after availing a vacation of 2 weeks.
<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject</th>
<th>No. of Hrs./Week</th>
<th>Duration of Exam in Hours</th>
<th>Marks for Total Marks</th>
<th>CREDITS</th>
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<tr>
<td></td>
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<td>Lecture</td>
<td>Field Work / Assignment / Tutorials</td>
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<td>Exam</td>
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<td>14JTT41</td>
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<tr>
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<td>14JTT43</td>
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<td>14JTT44</td>
<td>Evaluation of Project Phase-II</td>
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<td>14JTT45</td>
<td>Evaluation of Project Work and Viva-voce</td>
<td>-</td>
<td>-</td>
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</table>

| Total        |                                             | 8       | 04                         | 09               | 150     | 400    | 550 28|

**Grand Total (I to IV Sem.) : 2400 Marks; 94 Credits**

**Elective – III**

<table>
<thead>
<tr>
<th>Friction in Textiles</th>
<th>14JTT421</th>
<th>Theory of Yarn Spinning</th>
<th>14JTT422</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing Management</td>
<td>14JTT423</td>
<td>Financial Management</td>
<td>14JTT424</td>
</tr>
</tbody>
</table>
Note:

1) Project Phase – I: 6 weeks duration shall be carried out between II and III Semesters. Candidates in consultation with the guides shall carry out literature survey / visit to Industries to finalize the topic of dissertation.

2) Project Phase – II: 16 weeks duration during III Semester. Evaluation shall be taken during the Second week of the IV Semester. Total Marks shall be 25.


   Marks of Evaluation of Project:
   • The I.A. Marks of Project Phase – I & II shall be sent to the University along with Project Work report at the end of the Semester.

4) During the final viva, students have to submit all the reports.

5) The Project Valuation and Viva-Voce will be conducted by a committee consisting of the following:
   a) Head of the Department (Chairman)
   b) Guide
   c) Two Examiners appointed by the university. (Out of two external examiners at least one should be present).
OBJECTIVES:

This course aims at updating the knowledge of students in following fields of fiber physics.
1. Investigation of fiber fine structure using various advanced instruments.
2. Elaborated study of various mechanical behavior of fibers, which includes time temperature, super position, WLF equations and mechanics of fiber in composite form, bending, frictional and torsional behavior.
3. In depth study in moisture relations, optical, thermal and electrical properties of fibers.

OUTCOME:

1. This course work prepares the students to face real problems related to fiber behavior in various fields of textiles viz- spinning, weaving chemical processing and garmenting.
2. As this subject deals with the most fundamental aspects of textiles (fibers), in-depth knowledge in this subject helps in carrying out any kind of research in textiles and allied fields.

**Introduction to macromolecular physics:** Modern concepts of fiber structure. Physical methods of structural characterization of fibers, viz., DGC, TEM, SEM, WAXS, SAXS, IRS, NMR, DSC and DTA.  

**Deformation of elastic solid:** Generalized Hook’s Law, Component of Stress and strain. Linear visco-elastic behavior of fibers.

Moisture Properties: Study of molecular theory of moisture hysteresis, 2 and 3 phase moisture adsorption theories. Heat of sorption in textile fibers. Effect of moisture on mechanical properties of fibers. 10 Hrs.

Fibre Properties: Study of optical properties, thermal, frictional, electrical, Di-electric and static properties of fibers. 10 Hrs.

REFERENCE BOOKS:

2. “Mechanical properties of polymers” - I M Ward
5. “Characterization of polymers” - Campbell and White
6. “Introduction to polymer visco-elasticity” - Aklonis
7. “Physical polymer science” - L.H. Sperling
Objectives: This course work will help the student to enhance their knowledge in modern knitting process, machines and application. Also give the student an independent knowledge about Non-woven production and application.

1. Types of knitting machines, structures, specialty of warp knits.
2. Warp knitting machines and their working to produce various warp knit structures and their uses.
3. Type of warp yarn required for warp knitting and calculations involved.

Outcome: Student will have an in depth knowledge about warp knitting and non-woven fabric production. It will update the knowledge about modern aspects of warp knitting and non-woven production and application.

KNITTING

Warp knit fabrics; warp knit v/s woven construction, Single needle bar structure and working mechanism, pattern mechanism. Five basic over lap/ under lap variations, closed lap and open lap, direction of lapping at successive courses. Classes of warp knitting machinery, knitting cycle, Tricot, Raschel machines. Knitting elements in Raschel machine, knitting cycle in Raschel. Knitting action of the single needle bar Raschel and compound needle.

10 Hrs.

Knitting elements of Tricot machines, knitting cycle in Tricot machine. Plain Tricot structures, knitted with two full set guide bars, two bar Tricot, Shark skin, Queenscord, Velour and Velvet structures, Satin, overfed pile structures, reverse lock knit. Differences between Tricot and
Raschel machines and fabrics. Laying-in in warp knitting, rules governing, laying-in, fall-plate patterning, full width weft insertion, cut presser and miss press structures. Modified warp knit machines and fabrics:- Fall plate and chopper bar Raschel, co-we-nit, weft insertion in knitting. Pattern controlling mechanism, pattern wheels, electronic jacquards.

10 Hrs.

Yarns for warp knitting:- Materials for warp knitting, filament and spun yarns, unconventional yarns, important yarn properties for warp knitting, winding and warping for warp knitting. Faults in warp knits. warp knitting calculations

5 Hrs.

NONWOVENS

13 Hrs.

Structure of non-wovens: web geometry, fiber orientation curl factor, web density. Identification, properties and application of different non-wovens. Methods of tests: porosity, tear strength, air permeability, tensile strength, 3-point bending test, fatigue test, CBR Loading, cone puncture test, Absorbency test, peeling test, pilling test, Study of DIN standards.

12 Hrs.

REFERENCE BOOKS:
4. “Non-woven Bonded Fabrics” - Joachim Lünenschloss, Wilhelm Albrecht
OBJECTIVES:

This course aims at updating the knowledge of students in the field of wet processing such as different dyes and their structural aspects, dye-fibre interactions, latest developments in dyeing, printing and finishing of natural and synthetic textiles. Studies on garment processing will help students to understand various aspects and developments in garment processing.

OUTCOME:

This Course prepares the students thoroughly with respect to advances in wet processing aspects in industry. Students can make their careers in garment and textile wet processing industries by following various principles studied in the course.


**Finishing:** Modern developments in finishing of natural and synthetic textiles. Finishing of textiles with various specialty chemicals. **10 Hrs.**

**Developments:** Modern developments in textile and garment printing, color measurement and computer colour matching concepts. Latest development in natural dyes and their application on various fibers. **10 Hrs.**

**REFERENCE BOOKS:**
1. “Textile Colouration” - C.L.BIRD.
3. “Chemical Technology of Textile fibers” – ER Troatman.
5. “Eco-friendly Textile wet processing-coordinator” NCUTE Publication - Dr. R.Ashkan
6. “Environment Problems in chemical processing of Textiles, NCUTE Publication - Dr.A.Asokan, Ms. Yogita
M.TECH. Textile Technology
SEMESTER – I
RESEARCH METHODOLOGY

<table>
<thead>
<tr>
<th>Subject code</th>
<th>IA Marks</th>
<th>No. of Lecture Hours / Week</th>
<th>Exam Hours</th>
<th>No. of Practical Hours / Week</th>
<th>No. of Tutorial</th>
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<th>Exam Marks</th>
</tr>
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<tbody>
<tr>
<td>14JTT1</td>
<td>50</td>
<td>04</td>
<td>03</td>
<td>---</td>
<td>02 Hours/ Week</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

OBJECTIVES:
1. Statistical tests are essentially required to substantiate the results of any technical projects.
2. Statistical test clearly indicate the significant difference between the samples through F and T-tests.

OUTCOME:
Students can apply the principles of statistics to any problems related to yarn manufacture, fabric construction and garment designing satisfactorily and can work in apparel manufacturing and research institutions.

Research Methodology: Introduction, meaning of research, objectives, types and significance of research, defining a research problem, formulation of a hypothesis, research design and features of good design, methods of data collection, primary and secondary data, designing a questionnaire. Interpretation of results and report writing.


Sampling Techniques Statistical Inference: Random sampling, simple random sampling and stratified random sampling. Non-sampling errors. Random sampling, simple random sampling and stratified random sampling. Non-sampling errors. Statistical hypotheses, Type-1 and Type-2 errors, level of significance, size and power of a test. Definition of Chi-square, t and F distributions. Central limit theorem. Tests for the mean, equality of two means, variance (for large and small samples), large sample tests for proportions, Chi-square test for goodness of fit and independence of attributes in contingency tables. Confidence interval. Design of Experiments, Correlation and Regression: Analysis of variance. One way and 2 way classified data. Design of


**REFERENCE BOOKS:**

4. “*Introduction to probability and statistics for engineers and scientists*” - S. M. Ross, Elsevier Publications.
OBJECTIVES:

Basic mathematics is required for application to find solutions for industry problems. This course aims at updating the knowledge of students in the field of advanced mathematics which is very important in textile and garment fabric manufacture calculations.

OUTCOME:

Students can analyze the fibres, yarns, fabrics and garments with the knowledge of advanced mathematics.

**Fourier series, Partial differential equations of first order:** Periodic functions - Fourier series of functions with period’s 2 and 21 half range - Fourier cosine and sine series - odd and even functions. Formation Lagrange’s methods for linear equations, standard types of nonlinear equations - Charpits methods - Fourier series solutions of one dimensional wave.  

**Special functions:** Beta and Gamma functions - relation between beta and Gamma functions standard properties and problems. Complex variables: Complex functions - limits, continuity and derivatives of functions- analytical itemann equations of Cartesian and polar forms.

**Calculus of variables:** Variation of fundamental of a single variable with fixed boundary, Euler’s equation, application to isoperimetric and minimal surface problems. Variations of functional dependent on higher derivatives. Simple problems.


10 Hrs.

REFERENCE BOOKS:

1. “Special functions of mathematical physics and Chemistry” - I.N.Snaddon, ELBS.
6. “Numerical Analysis” - S.S. Shastry
OBJECTIVES:

1. Designing of yarn for various end uses should be studied and understood.
2. The end use performance depends on the design of yarn and quality particulars of yarn.

OUTCOME:

This course helps students to work in apparel and technical industry with a wide knowledge on different yarns and their structural aspects. This knowledge on yarns will help correlate with fabric properties for various applications.

**Importance of Yarns:** Designing yarns for specific end-uses. Selection of fiber / filament, structure of fiber / filament, spun yarns, multifilament yarns, textured yarns and micro denier multi filament. Yarn diameter derivation of Pierce, Grosberg and Dickson formulae. Functional properties of end products.  

**10 Hrs.**

**Yarn Structure and Yarn Regularity:** Geometrical properties of single and folded yarns. Derivations of related equations. Open & hexagonal packing and their merits and demerits. Twist contraction and retraction - practical applications. Twist migration and segment length in spun and filament yarns - Theoretical analysis of yarn irregularity - blend irregularity.  

**10 Hrs.**

**Transfer of Force:** Transmission of force from fiber to fiber in spun yarns - mechanism of yarn breakage.  

**10 Hrs.**

**Relationship:** Effect of fiber properties and their geometrical configuration on tensile properties of yarns. Concept of elongation.  

**10 Hrs.**

**Blends:** Effect of properties of constituent fibers and their composition on the behavior of blended Yarns.  

**10 Hrs.**
REFERENCE BOOKS:

M.TECH. Textile Technology  
SEMESTER – I  
ELECTIVE – I: STRATEGIC AND TECHNOLOGY MANAGEMENT

<table>
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<tr>
<td>Total No. of Lecture Hours</td>
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<td>Exam Marks : 100</td>
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</table>

**OBJECTIVES:**

In the present scenario the strategic management techniques are useful in following areas.

1. The new strategies are useful in increasing the productivity and quality to meet the global challenges.
2. The concept of strategic management can be successfully adopted in garment industry.
3. Students can update their knowledge about the modern management concept and they can adopt these concepts in the garment sector.

**OUTCOME:**

The new management concepts can prepare the students to take up the new challenges in the present global scenario.

**Management information system:** Introduction and background frame work-information needed economics System view - role of MIS on various levels - structure of MIS – Information network - system life cycle - data flow - decision trees.  
10 Hrs.

**Corporate strategy and planning:** Concept of frame work, corporate management, role, Function skill.  
10 Hrs.

**Strategic analysis:** cost dynamics - portfolio analysis – financial analysis, Strategic choices. Alternating - diversification-mergers and acquisition implementation and evaluation of strategy.  
10 Hrs.

**Strategic management and leadership:** Role of leadership - process of leadership – line structure, styles.  
10 Hrs.

REFERENCE BOOKS:
M.TECH. Textile Technology
SEMESTER – I
ELECTIVE – I: APPLICATION OF IT IN TEXTILES

<table>
<thead>
<tr>
<th>Subject code</th>
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<tr>
<td>Exam Hours</td>
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<tr>
<td>No. of Practical Hours / Week</td>
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<tr>
<td>No. of Tutorial</td>
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<tr>
<td>Total No. of Lecture Hours</td>
<td>50</td>
</tr>
<tr>
<td>Exam Marks</td>
<td>100</td>
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</tbody>
</table>

**OBJECTIVES:**

The main objective is to understand the use of IT in textile and garment industries. Knowledge of CAD/CAM can enhance the knowledge of students.

**OUTCOME**

The students will be able to secure good positions in textile and garment industries where IT application is predominant. They will be able to handle advanced software related to textiles and garment design and manufacture.

**Introduction to IT in Textiles:** information technology and the web paradigm, E-business application for textile industry. 10 Hrs

**Enterprise resource planning:** Structure of ERP, General Principles involved in the application of ERP, ERP models, ERP selections for the textile industry. 10 Hrs

**Internet and internet concepts:** Internet based manufacturing EDI for textile businesses, logistics management, management information systems in spinning, weaving and wet processing sections. 10 Hrs

**Applications:** CAD\CAM in Textiles, Information technology in fashion and garment industry. 10 Hrs

**Management:** Total quality management and information technology. 10 Hrs
REFERENCE BOOKS:
4. “Electronic Commerce” - Gary P. Schneider
M.TECH. Textile Technology  
SEMESTER – I  
LAB COMPONENT

<table>
<thead>
<tr>
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<th>IA Marks</th>
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<td>Exam Hours</td>
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<tr>
<td>No. of Practical Hours / Week</td>
<td>03</td>
<td>No. of Tutorial</td>
<td>--</td>
</tr>
<tr>
<td>Total No. of Lecture Hours</td>
<td>14</td>
<td>Exam Marks</td>
<td>50</td>
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</tbody>
</table>

**OBJECTIVES:**

The main objective is to understand the application of theoretical knowledge.

**OUTCOME**

The students will be able to tackle problem both in industry and business.

Collection of special knit structure and analysis of the same. Understanding relationship between structure and geometry. Design and product development.


M.TECH. Textile Technology
SEMESTER – I
SEMINAR

<table>
<thead>
<tr>
<th>Subject code</th>
<th>14JTT17</th>
<th>IA Marks</th>
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</thead>
<tbody>
<tr>
<td>No. of Lecture Hours / Week</td>
<td>--</td>
<td>Exam Hours</td>
<td>--</td>
</tr>
<tr>
<td>No. of Practical Hours / Week</td>
<td>03</td>
<td>No. of Tutorial</td>
<td>--</td>
</tr>
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<td>Total No. of Lecture Hours</td>
<td>--</td>
<td>Exam Marks</td>
<td>--</td>
</tr>
</tbody>
</table>

OBJECTIVES:

The main objective of this course is to prepare the students to improve their presentation skills. The course also helps students to enhance their report preparation skills.

OUTCOME:

The students become confident in presentation of ideas, reports of companies, production data, interpretation of data etc.

In the subject each student has to present a seminar on the topics suggested by the concerned faculty. At the end of the semester a detailed seminar report has to be submitted to the department for allotment of internal assessment marks.
OBJECTIVES:
This subject is required to understand all testing details.
1. Fiber parameters are required to find spinning consistency index.
2. Yarn parameters are required to decide its application for knitting or weaving.
3. Fabric properties are required depending on the end use application.

OUTCOME:
Students who have studied the subject can confidently work in QC dept. and research institutions.


Inspection: Introduction, raw material inspection, In-process Inspection - spreading, cutting, sewing and pressing. Final inspection. 10 Hrs.

Quality Control Program: Planning for the quality control program, inspection and analysis of data. Tools of quality control. ISO 9000 series standards. Total quality management. 10 Hrs.

REFERENCE BOOKS:

5. “International Apparel Quality Manuals” - KES- F and FAST manuals.
OBJECTIVES:
This course aims at preparing students towards environmental aspects of textile and garment industries. They have to understand various environmental issues concerned to control pollution and know environmental laws.

OUTCOME:
Students can help analyze the environmental related issues of garment and textile industries, governmental policies and make decisions on eco aspects of industries.

Water: Source of water and their characteristics- surface water, ground water, rain water etc. Constituents of water and their effects on textile wet processing. Colour, turbidity, suspended solids, dissolved solids, PH value, acidity, alkalinity, hardness, iron and manganese, copper, chlorine organic growth. 10 Hrs.

Quality requirements: Quality requirements of water for silk reeling and textile processing. Conservation and reuse of water. Processing chemistry - fibres, chemicals, type of chemical processing. 10 Hrs.

Textiles effluent: Introduction to textiles effluent, characteristics of textiles processing, dye manufacture and synthetic fibres formation industries, Reduction and pollution control at mill state Methods and techniques used for effluent treatmens. 10 Hrs.

Standard regulations for effluents: Effluent testing parameters- colour and physical appearance, odour, temperature, PH value total suspended solids, total dissolved solids, BOD, COD. 10 Hrs.

REFERENCE BOOKS:

3. “Environmental problems in chemical processing of textiles” - NCUTE Publications.
M.TECH. Textile Technology
SEMESTER – II
ADVANCED SILK TECHNOLOGY

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<th>Subject code</th>
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Objectives:-
This course work aims at imparting knowledge to the students at post graduate level in the following field of advanced methods of production of silk and their application in the diversified fields.

- Present scenario of Indian Silk industry, the quality and production aspects, silk production in other countries.
- Development in various stages of production of silk and spun silk.
- Structural aspects of silk such as composition, micro structure, crystalline structure, etc.,
- Recent development in silk dyeing and preparatory process.
- Modern technology and methods in silk finishing and eco-friendly finishes.
- Developments in processing and application of silk for non apparel purposes. Such as bio-medical application,

Outcome:
The subject will enhances the knowledge of student of new methods, new techniques of production of silk and their diversified applications. It will enable the student to learn the structure details and relationship between structure and properties of silk. Also the subject will help the student to acquire knowledge about new techniques and methods of dyeing and finishing of silk, eco friendly and economical aspects of dyeing and finishing of silk.

Indian Silk Industry and Process: Production of silk, quality of silk, problems and prospects. Present Scenario of Indian Silk Industry Production of silk produced by the other countries across the world and quality of silk produced by their Modern approach to silk cocoon production and cocoon characteristics evaluation. Recent developments in cocoon, stifling, sorting, grading, cooking and reeling. Technological developments in reeling machines and methods to increase the production of raw silk. 10 Hrs.

Production of Spun Silk: Conversion and modern approach, prospects and application, Production of Indian cottage silk and its suitability for producing traditional silk fabric with intricate designs. Production of soft silk, creep, georgette, chiffon etc. Production of damasks and brocades and silk furnishing cloth. 10 Hrs.

Dyeing and Finishing: Types of dye used, factors affecting dyeing behavior of silk, preparation silk for dyeing. Recent develop in degumming, bleaching, dyeing, Dyeing of silk with reactive, direct and natural dyes. Finishing of silk fabrics: Types and methods modern technologies involved to impart wrinkle resistant finish, stair repellant, anti – microbial finish and other specialty finishes applicable to silk and its blends. Developments in machineries, chemicals and auxiliaries used for silk dyeing and finishing. 10 Hrs.

Developments: Processing of silk fibroin, filaments, hydrogels production of 3D sponges, membranes of silk, non wovens, fluorescent silks, biomedical application of silk sutures and wound healing, tissue Engineering, drug delivery. Silk fibre reinforced composites. Spider silk and their applications: Types of spider silk, chemical compositions, general properties, tensile properties and application of spider silk. 10 Hrs.

REFERENCE BOOKS:

2. “FAO Manual on silk”.
3. “Silk man companion” – Central Silk Board, Bangalore
4. “Silk wet processing” - Dr. M. L. Gulrajani, IIT Publication.
5. “Silk Dyeing” - Dr. V. A. Shenai, Sewak Publications.
9. “Grammar of Textile Design” – H Nisbet
OBJECTIVES:

This course work is more useful for the students to know about the recent development in weaving sector. Many manufactures are modernizing the weaving sectors so that the knowledge about the recent development in weaving machineries is useful for the study.

1. Students can acquaint the knowledge about the modern weaving machine like Projectile, Rapier, Air jet, Water jet & multiphase concept.
2. It can update the knowledge about selvedges, quality norms required, applicability etc.,
3. Students can study, geometry, style, speed, WIR applications etc.,

OUTCOME:

Students with this knowledge can work in the modern weaving industries, garment manufacturing units with a thorough knowledge of fabric properties, manufacturing methods, machinery knowledge.

Pre requisites: Pre requisites for successful installation of shuttle less looms, yarn quality norms for unconventional weaving, preparatory process to unconventional weaving. 10 Hrs

Weft insertion methods: Weft insertion by projectile, rapier, air jet, water jet, weft insertion stages of different weaving machines.
Weft insertion by other methods by multi-phase weaving. Study of unconventional selvedges, accumulators, shed geometry, weft consumption, weft unwinding tension. 10 Hrs.
**Controls:** Productivity- its measurement and control. Material handling equipment and importance.  

**Management:** Management of loom shed, maintenance.

**Developments:** Modern development in weaving machines projectile, rapier, air jet, water jet, QSC wider width machine. Techno economics of unconventional weaving machines.

**REFERENCE BOOKS:**

1. “Principles of Weaving” – R Marks and A T C Robinson &, Textiles Institute, Manchester, 1976
4. “Handbook of Weaving” – Sabit Adanur
OBJECTIVES:

The objective of this study is to enhance the knowledge of students in modern aspects of fabric engineering. This will help to improve their knowledge on designing of new fabrics and garments.

OUTCOME:

The result is that students will be able to design and develop new fabrics for various applications.


Geometry of fabric structure: Pierce’s basis and modified models – Painter – Adom’s and Love’s technique descriptive and mechanistic models. Kemp and Hamilton: Twin arc, Olofson – Snowdens and other models. 10 Hrs.


Other deformations: Bending and tensional deformations – buckling, shear and drape of fabrics – theory various Models – behavior. 10 Hrs.

REFERENCE BOOKS:

M.TECH. Textile Technology  
SEMESTER – II  
ELECTIVE – II: HUMAN RESOURCE MANAGEMENT

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<th>Exam Hours</th>
<th>No. of Practical Hours / Week</th>
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OBJECTIVES:

The main objective of this course is to prepare the students to understand the basic principles of HR management as the knowledge of HR management is extremely important in textile and garment industries.

OUTCOME

The students will be able to analyze recruitment procedures, incentive schemes and wage/salary administration procedures.

Introduction to human resource management with reference to objectives and policies.  


Methods of recruitment and selection. Promotion, Demotion, transfer policies. Industrial disputes procedure for settlement of disputes.  

Welfare measures, bonus facilities, Wage and salary administration and incentive Schemes.  

Motivation and Morale. Labour Management relations.  

Objectives and functions of trade unions. Factories act and their importance Factories Act.
REFERENCE BOOKS:
4. “Personnel Management” - Subratha Ghosh
OBJECTIVES:

This course work aims at imparting knowledge to the students in following fields of advanced manufactured fiber technology.

1. Physics and mechanics of fluid flow in MMF spinning.
2. High speed melt spinning, mechanism of dry and wet spinning.
3. Recent advances in MMF spinning.
4. Studies on new millennium fibers Viz-ultra fine fibers, high touch fibers, Nano fibers , ultra performance fibers etc.,
5. Application of fibers in various fields like bio-technology, sports, electronics, bio-mimicking, ocean etc.,

OUTCOME:

This course work prepares the students to work in most modern man-made fiber manufacturing plants in India and abroad. Subject also prepares and motivates to students to take up the research work in the field of advanced manufactured fibers, technical and smart textiles.

Structural principles of fibre forming polymers. Rheology and hydrodynamics in MMF spinning. Development of fibre structure during man-made fibre spinning. Study of various variables in melt spinning and effect of various parameters on linear density of fibres. **10 Hrs.**
High speed melt spinning: One step (SP) and two step spinning (TSP) process. Study of fluid flow in spin line. Modifications to be done in spinning, mechanism for high speed melt spinning. Recent developments in dry and wet technology. Study of various types of spinnerettes, orifices used for MMF spinning. Mechanism of crystallization during MMF spinning. 10 Hrs.

Melt spinning of Hollow, Multicomponent, Ultra-fine and Nano fibres. Spin finish application: Composition of spin finish, various methods of spin finish application, spin finish for staple fibre production. 10 Hrs

Detailed study of mechanism of heat setting of synthetic fibres. Study of property changes in synthetic fibres during heat setting. Study of various physical and chemical methods of modifications of PET, NYLON & Acrylic fibers. 10 Hrs.

New fibres: Introduction to various high performance fibres, Kevlar-LCP behaviour, dry jet spinning of Kevlar fibres, Carbon fibres, raw materials, chemistry of production, surface treatments. Recent trends in production of high performance fibres like Boron, Silicon, Glass, PBT, PBZO, PBZT and aromatic polyesters. High tech fibres, biomimetic chemistry and fibres, biotechnology and fibres, electronics and fibres, fibres in sports, fibres in ocean. 10 Hrs.

REFERENCE BOOKS:

OBJECTIONS:

1. Identification of defects is first priority of industry.
2. Remedial measures and corrective action should be taken.

OUTCOME:

Students can satisfactorily work in quality control dept.

Lap formation and control of lap uniformity. Irregularities of carded, drawn and combed Silver- their control. Irregularities of roving and yarns- their control.  

10 Hrs.

Influence of different materials and their blends on irregularity. Index of blend irregularity and its influence on the quality of end product.  

10 Hrs.

Influence of ambient conditions on the irregularity of material at various stages of processing restricted to spinning of cotton and its blends.  

10 Hrs.

Irregularities of yarns produced on ring, rotor, friction and air jet spun systems.  

10 Hrs.

Instruments used for measurement of irregularity – analysis and interpretation of data and graphs remedial measures.  

10 Hrs.
REFERENCE BOOKS:

4. “Roller Drafting” - Nogeera

M.TECH. Textile Technology
SEMESTER – II
LAB COMPONENT

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OBJECTIVES:

The main objective is to understand the application of theoretical knowledge.

OUTCOME

The students will be able to tackle problem both in industry and business.

Analysis of HVI, AFIS, KESF and FAST result sheets. Analysis of Uster spectrograph. Comparison of specification and test methods of different standard institutions. Collection of inspection reports from industry and its analysis.

OBJECTIVES:

The main objective of this course is to prepare the students to improve their presentation skills. The course also helps students to enhance their report preparation skills.

OUTCOME:

The students become confident in presentation of ideas, reports of companies, production data, interpretation of data etc.

In the subject each student has to present a seminar on the topics suggested by the concerned faculty. At the end of the semester a detailed seminar report has to be submitted to the department for allotment of internal assessment marks.
Objectives:
This course work aims at imparting knowledge to the students at post graduate level in the following field of advanced methods of production of apparel.

1. Provide knowledge about apparel manufacture, functions of apparel manufacturing, advanced apparel production Technology. Application of computers and electronics in ferment designing all levels of garment production.

2. Latest developments in machinery equipment, automation etc.

3. Give an overview of Indian Apparel Industry, structure of the industry, apparel export to Europe and Western World.

Outcome:
Student will have an opportunity to learn the modern aspects of apparel production and its adaptation by Indian apparel industry. It will give overall prospects of garment manufacturing industry as an upcoming textile related industry.


10 Hrs

10 Hrs

Technological advances in sewing garment: History of sewing development of the industrial saving, machine advances in sewing needle design, advances in sewing thread technology, Advances in sewing machine automation, semi automatic sewing equipment, machine using computer numerical control. Future trends in cloth technology.  

10 Hrs

Development in pressing technology for garment finishing: The pressing process, pressing with pressure pressing without pressure, crease resistant finishes and permanent creasing future trends. Packaging and ware housing: Type of packing and packing materials, quality specification, merchandise packing and shipping packing. Intra transport, ware housing, computerized storage systems.  

10 Hrs

Production control: Production analysis, distribution of documents and records, types of control forms, producing many styles in one line and determining supervisory sections in production lines. Production control charts, reports, production grid principle for assigning partial production, line operators, evaluation.  

10 Hrs

Indian apparel industry: Overview of technology in apparel manufacturing technology, usage, regional features and structures of the industry, Indian apparel export and important product category, domestic market and domestic brands, technology status and outlook. Apparel productivity- Apparel productivity in India and Western world, global comparison characteristics of low, medium and high productivity manufactures and factors associated with productivity actions towards higher productivity.  

10 Hrs.

REFERENCE BOOKS:

2. “Managing Productivity in the Apparel Industry” - Rajesh Bheda, CBP Publisher and Distributors.
4. “Seams Productions and Analysis” - Radh D Clock

M.TECH. Textile Technology
SEMIESTER – IV
ELECTIVE – III: FRICTION IN TEXTILES

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OBJECTIVES:

The main objective of this course is to prepare the students to understand the basic principles of friction and its use in textiles. They can understand surface characteristics of fabrics, garments and yarns.

OUTCOME

The students can able to use the application of friction to analyse the fabrics based on their frictional behavior.

General mechanism of friction Laws of friction, theories of friction, friction in various textile processes like spinning, weaving and chemical processing etc. Detailed study of various methods of measurement of fibre friction in textiles. Role of friction in the mechanical behaviour of fabrics.

10 Hrs

Study of surface geometry of synthetic fibres. Spin finish application to synthetic fibres, Theory of spin finish application, various methods of spin finish application, spin finish composition for synthetic filaments, staple fibres and textured yarns.

10 Hrs

Abrasion of textile surfaces measurement of abrasion resistance, factors affecting the abrasion resistance.

10 Hrs

Resistivity and static behaviour of textile surfaces, effect of photochemical and environmental degradation on the surface properties of textile fibres. Soil release from the textile surface, stain and water repellency of textile surfaces.

10 Hrs

Generation of static charges in textile process and their remedies. Role of fiber friction in garment making, Effect of friction on comfort property of textiles.

10 Hrs
REFERENCES:

M.TECH. Textile Technology
SEMESTER – IV
ELECTIVE – III: THEORY OF YARN SPINNING

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OBJECTIVES:
1. Fiber properties should be understood to predict the count of yarn that can be spun.
2. Yarn quality depends on fiber parameters.
3. Spinning details are the basic objectives of textile industry.

OUTCOME:
Students who have studied this can develop new yarn production methods, fancy yarn production systems. The course will help them set machine parameters thoroughly for all types of spinning

FIBRE DISPERSION: Ginning of cotton; the necessity of fibre-individualization; fibre opening in blow-room machinery; the mechanism of fibre-dispersion during carding operation; the minimum requirements during carding and the new approaches to improve fibre-dispersion in carding operation. Neps formation and theory of hook formation. 10 Hrs.
FIBRE PROCESSING: Methods adopted to clean the fibre from trash, short fibres and neps; role of blow-room, card and comber in fibre cleaning. Definition of fibre-extent; influence of fibre-extent on yarn quality; improvement of fibre-extent by straightening actions in carding, drafting and combing.  

10 Hrs

ATTENUATION: Principle of rollers drafting and its application in yarn production; drafting irregularities—their causes and remedies; the function of aprons in roller drafting; limitation of apron-drafting and the scope for improvement; mechanism of wire-point drafting and its application in yarn production; merits and demerits of wire-point drafting. Comparison of wire-point drafting with roller drafting.  

10 Hrs

TWISTING: Effect of twisting of staple-fibre strand on its strength; meaning of twist multiplier and the basis of selection of required twist; fundamental requirement to create real twist in a strand; mechanism of different twisting principle—ring-twisting, open-end twisting, air-jet twisting, up-twisting, two-for-one twisting, hollow-spindle twisting.  

10 Hrs

LEVELLING and FIBRE BLENDING: Influence of intermediate product uniformity on yarn uniformity; methods of leveling adopted during spinning processes. Important of fibre-mix homogeneity on yarn quality; types of mixing during spinning preparatory process; assessment of blend efficiency.  

10 Hrs

REFERENCE BOOKS:
OBJECTIVES:

The main objective of this course is to prepare the students to understand the basic principles of marketing management as the knowledge of marketing management is extremely important in textile and garment industries.

OUTCOME

The students will be able to analyze marketing strategies, export and import procedures.


10 Hrs.

Channel Decisions Nature and characteristics of Marketing Channel Functions, channel dynamics, Channel Design and Management decisions. Communication process - Steps in the development of effective communication, Designing message, selection communication channels, deciding promotion mix, measuring results. Promotional Mix tools. Advertising, Sales promotion, personal selling, public relations, and direct marketing. Marketing organization & implementation: Evolution, ways of organizing the marketing departments, marketing relations with other departments.

10 Hrs.

Smart cards credit cards based - other emerging payments technologies - E-governance and implications - Technical specification of digital currencies.


The concept and the need for international marketing - the nature, scope and variety of international markets. International market Vs Local Markets, differences & Similarities. Trade groups, international regulations, trade bodies & Organization like IMF, World Bank & Conference e.g. GATT, UNCTAD, their impact on world trade Euro-dollar & Petro Dollar Market. Exchange rate fluctuations on Imports and Exports.

REFERENCE BOOKS:

OBJECTIVES:

The main objective of this course is to prepare the students to understand the basic principles of financial management as the knowledge of financial management is extremely important in textile and garment industries.

OUTCOME

The students will be able to analyze financial statements, balance sheets and audited reports.

Financial Management: An overview, function and goals of financial management, financial planning and major financial decision areas.  

10 Hrs

Capital structure: Theories of capital structure, NI and NOI approaches, capital structure decision, EBIT – EPS analysis. RO – ROE analysis, cash flow analysis.  

10 Hrs

Capital Budgeting: Methods of capital budgeting, investment criteria, NPV, IRR, Pay Back Period, Risk analysis in capital budgeting.  

10 Hrs

Working Capital Management: Current assets, Cash and Inventory management, EQQ, ABC analysis.  

10 Hrs


10 Hrs
REFERENCE BOOKS: