Scheme and Syllabi of M. TECH. TEXTILE ENGINEERING (PART TIME) Batch-2011

Schedule of Teaching:

<table>
<thead>
<tr>
<th>Lectures</th>
<th>Tutorial</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
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</tbody>
</table>

Schedule of Examination

<table>
<thead>
<tr>
<th>Examination</th>
<th>Time in Hrs</th>
<th>Sessional Examination Marks</th>
<th>External Theory Marks</th>
<th>Viva</th>
<th>Total Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Theory subjects</td>
<td>3Hrs</td>
<td>50</td>
<td>100</td>
<td>-</td>
<td>150</td>
</tr>
<tr>
<td>Project</td>
<td>-</td>
<td>50</td>
<td>-</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>Seminar</td>
<td>-</td>
<td>100</td>
<td>-</td>
<td></td>
<td>100</td>
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<tr>
<td>Dissertation</td>
<td></td>
<td>Satisfactory/Not-Satisfactory</td>
<td></td>
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</tr>
</tbody>
</table>

Course Code | Course Name
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**Semester I**
- MTTE-101 Advances in Fibre Production Technologies
- MTTE-102 Advances in Yarn Production Technologies
- MTTE-XXX Elective 1

**Semester II**
- MTTE-201 Advances in Fabrics Production Technologies
- MTTE-202 Structural Mechanics of Yarns

**Semester III**
- MTTE-301 Structural Mechanics of Fabrics
- PGRM Research Methodology
- MTTE-XXX Elective 2

**Semester IV**
- MTTE-401 Knitting and Nonwoven Technology
- MTTE-XXX Elective 3

**Semester V**
- MTTE-501 Technical Textiles
- MTTE-XXX Elective 4
- MTTE-502 Project
- MTTE-503 Seminar

**Semester VI**
- MTTE-601 Dissertation
Eligibility Criteria

B.E./B.Tech. in Textile Technology, Textile Engineering, Textile Chemistry, Man-made Fibre, Fibre Technology, Fashion Technology, Apparel Engineering, Carpet Technology or equivalent with minimum aggregate marks of 55%.

Duration: Three years (6 Semesters)

Total number of seats: 25

Number of Courses: 12 (Theory);

Project & Seminar: 01

Dissertation: 01 Semester

<table>
<thead>
<tr>
<th>Semester</th>
<th>Number of courses/ Seminar</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>3 Theory Courses</td>
</tr>
<tr>
<td>II</td>
<td>2 Theory Courses</td>
</tr>
<tr>
<td>III</td>
<td>3 Theory Courses</td>
</tr>
<tr>
<td>IV</td>
<td>2 Theory Courses</td>
</tr>
<tr>
<td>V</td>
<td>2 Theory Courses, Project, Seminar</td>
</tr>
<tr>
<td>VI</td>
<td>Dissertation</td>
</tr>
</tbody>
</table>

1. A student will take and complete a total of 12 courses, followed by 01 Project, 01 Seminar, 01 dissertation.

2. The student can submit his/her dissertation at the end of 6th Semester.

3. The proposal for dissertation can be submitted in the beginning of 5th semester

Note:

I. Maximum duration for clearing the M. Tech Program shall be 5 years. In exceptional cases the duration for completing the program can be extended by one year with the permission of the competent authority.

II. There can be maximum of two supervisors for the dissertation. One should be atleast from the Department of Textile Technology of the Parent Institute.

Classes will be held on Saturday and Sunday only.
Detailed Syllabus of Core Courses

MTTE- 101 Advances in Fibre Production Technologies


Books Recommended:

MTTE- 102 Advances in Yarn Production Technologies

Processing of wool and man made fibres in new spinning systems. Non conventional methods of yarn manufacture. Air-vortex yarn. Quality standards of different yarns with emphasis on USTER standard

Books Recommended:

MTTE- 201 Advances in Fabric Production Technologies

Books Recommended:
MTTE 202 Structural Mechanics of Yarns


Books Recommended:

MTTE- 301 Structural Mechanics of Fabrics


Books Recommended:
PGRM  Research Methodology

Overview of research

Research and its type, identifying and defining research problem and introduction to different research designs. Essential constituents of literature review, Basic principles of experimental design, completely randomized, randomized block, latin square, Factorial, response surfaces.

Methods of data collection

Primary and secondary data, methods of primary data collection, classification secondary data, designing questionnaires and schedules.

Sampling Methods

Probability sampling: simple random sampling, systematic sampling, stratified sampling, cluster sampling and multistage sampling. Non –probability sampling: convenience sampling, judgement sampling, quota sampling. Sampling distributions.

Processing and analysis of data

Statistical measure and their significance: Central tendencies, variation, skewness, kurtosis, time series analysis. Correlation and regression, Testing of Hypothesis: Parameters (t, z and f) Chi square, ANOVA and non parametric tests.

Multivariate analysis

Multiple regression, factor analysis, Discriminant analysis, cluster analysis,

Multidimensional scaling

Reliability and Validity

Test-rested reliability, alternative-form reliability, internal-comparison reliability and scorer reliability, content validity, criterion related validity and construct validity.

Essentials of report writing

Note: Application and uses of various software for case studies should be essential.

Reference Books:


MTTE- 401 Knitting and Nonwoven Technology

Weft and warp knitting machines, Different forces acting on needle butt, dynamics of knitting process, mechanics of loop formation, different machines, process and yarn parameters affecting the yarn tension in knitting zone and loop length, development in knitting machines, design and performance of high speed knitting cam, yarn feeding devices on circular knitting machine, warp knitted fabric and its different industrial uses, geometry and properties of knitted fabrics, process control in knitting, classification and areas of application of nonwoven fabrics, different methods of production of nonwoven fabric, effect of machine, fiber and process variables on properties of nonwoven fabrics, failure mechanism in nonwoven fabrics, prediction of needle punch nonwoven fabric behaviour.

Books Recommended:

MTTE- 501 Technical Textiles

Definition and scope for technical textiles, brief idea about technical fibres, role of yarn and fabric construction. Filtration textiles: Definition of filtration parameters, filtration requirements Geotextiles: Brief idea about geosynthetics and their uses, essential properties of geotextiles, geotextile testing and evaluation, application examples of geotextiles. Medical textiles:
Classification of medical textiles, description of different medical textiles. Protective Clothing: Brief idea about different type of protective clothing, functional requirement of textiles in defence including ballistic protection materials and parachute cloth, flame retardant clothing, chemical protective clothing. General technical textile: Textiles in agriculture, electronics, power transmission belting, hoses, canvas covers and tarpaulins.

Books Recommended
Departmental Elective

MTTE 103 Physical Properties of Fibres


Books Recommended:


MTTE 104 Production Management in Textiles

Books recommended:


MTTE 204 Colouration and Finishing Technology

Books Recommended:
MTTE 302 Post Spinning Operations


Books recommended:

MTTE 303 Costing, Project Formulation and Appraisal

Costing—elements of costs, expenses excluded from cost, cost sheet, cost concept, cost classification, treatment of stock. Project Planning—Capital expenditure, phases of capital budgeting, generation and screening of project ideas, project rating index, resource allocation framework. Project Analysis—Feasibility study, product life cycle, market analysis, market planning, market survey and characterisation of markets, demand analysis, demand forecasting, technical analysis, project charts and layouts. Financial analysis—Cost of project, means of finance, projected financial statements, working capital requirement, estimate of sale and production, cost of production, cash flow, time value of money and cost of capital. Appraisal criteria—net present value, benefit cost ratio, internal rate of return, payback period, analysis of risk and social cost benefit analysis. Project implementation—Network techniques, PERT, CPM. Project Review and Administration

Books Recommended:
MTTE-304  Characterisation of Polymers and Fibres
(Note: Subject will be taught by Faculty of Chemistry)

Books recommended:

MTTE 402 Process Control in Spinning & Weaving
Books Recommended:

1. Process Control in Spinning by ATIRA
2. Process Control in Weaving by ATIRA
3. Process control in spinning by R. Chattopadhyay IIT, NCUTE, Delhi
4. Quality control in spinning by SITRA

MTTE 403 Computer Programming and its Applications


Programming in C++ - Statements and Expressions, Control statements. Structure, Functions: Function Overloading etc.

C++ as Object-Oriented Programming Language- Classes and Objects, Data Abstraction, Inheritance - Multilevel and Multiple inheritance etc., Polymorphism- operator overloading and virtual functions, file handling. Application development using C++.

Books Recommended:


MTTE 404 Environmental Practices in Textiles


Books Recommended:

1. Asolekar S, “Environmental problems in chemical processing of textiles” 1st Ed. NCUTE,
   Department of Textile Technology, IIT-Delhi, 2000.
MTTE 502 Quality Management


Books recommended:

MTTE 503 Garment Manufacturing Technology


Books Recommended:
2. Carr Harold and Barbara, “The Technology of clothing Manufacture”, Om Book Service, Delhi, 1998
MTTE 504 High performance Fibres and their Composites


Books Recommended:
<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Course Name</th>
<th>Contact Hours</th>
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</thead>
<tbody>
<tr>
<td>MTTE-103</td>
<td>Physical Properties of Fibres</td>
<td>4 Hrs</td>
</tr>
<tr>
<td>MTTE-104</td>
<td>Production Managements in Textile</td>
<td>4 Hrs</td>
</tr>
<tr>
<td>MTTE-302</td>
<td>Post Spinning Operation</td>
<td>4 Hrs</td>
</tr>
<tr>
<td>MTTE-303</td>
<td>Costing, Project Formulation and Appraisal</td>
<td>4 Hrs</td>
</tr>
<tr>
<td>MTTE-304</td>
<td>Characterization of Polymers and fibres</td>
<td>4 Hrs</td>
</tr>
<tr>
<td>MTTE-305</td>
<td>Coloration and finishing Technology</td>
<td>4 Hrs</td>
</tr>
<tr>
<td>MTTE-402</td>
<td>Process Control in spinning and Weaving</td>
<td>4 Hrs</td>
</tr>
<tr>
<td>MTTE-403</td>
<td>Computer Programming and Its Application</td>
<td>4 Hrs</td>
</tr>
<tr>
<td>MTTE-404</td>
<td>Environmental practices in Textiles</td>
<td>4 Hrs</td>
</tr>
<tr>
<td>MTTE-502</td>
<td>Quality Management</td>
<td>4 Hrs</td>
</tr>
<tr>
<td>MTTE-503</td>
<td>Garments Manufacturing Technology</td>
<td>4 Hrs</td>
</tr>
<tr>
<td>MTTE-504</td>
<td>High Performance Fibres and Composites</td>
<td>4 Hrs</td>
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