

Scheme of  
UNDERGRADUATE DEGREE COURSE

Textile Technology



Rajasthan Technical University, Kota  
Effective from session: 2021 – 2022



# RAJASTHAN TECHNICAL UNIVERSITY, KOTA

## SYLLABUS

2<sup>nd</sup> Year - IV Semester: B.Tech. : Textile Technology

### 4TT2-01: Fibre Science

Credit: 2

Max. Marks: 100(IA:30, ETE:70)

2L+0T+0P

End Term Exam: 2 Hours

SN	Contents	Hours
1	<b>Introduction:</b> Objective, scope and outcome of the course.	1
2	<b>Introduction to polymer materials</b> Polymers and their classifications, polymeric materials as fibres, plastics and rubbers, fibrous polymers and their morphology, molecular weight of polymers, different types of molecular weight averages, polydispersity, molecular weight measurement methods.	5
3	<b>Spinning processes</b> Introduction to melt spinning, melt spinning process, melt spinning variables and conditions for continuous spinning, fibre formation, spinning speed and its influence on structure and properties of final product, spin-draw processes.	5
4	Introduction to solution spinning (dry and wet spinning) processes and process variables, Dry spinning process and its dope preparation, fibre formation and spin stretch during dry spinning. Wet spinning process and its dope preparation, coagulation process, fibre formation and spin stretch during wet spinning. Salient features and comparative look on spinning processes.	4
5	<b>Post spinning processes</b> Introduction of spin finish, role of spin finishes, properties of spin finishes, spin finish components, methods of spin finish application, spin finish requirements for staple fibres, filaments, yarns and other processes, problems encountered during spin finish application. Introduction to drawing, drawing machines, the drawing behaviour of thermoplastic fibres, influence of drawing on structure and properties of fibres, draw warping. Introduction to heat setting, nature of setting, heat setting behaviour of polyamide and polyester fibres, thermal healing, measurement of degree of set.	8
6	<b>Texturing</b> Principle of texturing and its need, various kinds of texturing processes and machines, structural geometry of textured yarn, process variables of false twist and air jet texturing, Stuffer box crimping, gear crimping, knife edge crimping, hi-bulk acrylic yarns.	5
<b>Total</b>		<b>28</b>

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## SYLLABUS

2<sup>nd</sup> Year - IV Semester: B.Tech. : Textile Technology  
**4TT1-02/3TT1-02: Technical Communication**

**Credit: 2**

**Max. Marks: 100(IA:30, ETE:70)**

**2L+0T+0P**

**End Term Exam: 2 Hours**

SN	Contents	Hours
1	<b>Introduction:</b> Objective, scope and outcome of the course.	1
2	<b>Introduction to Technical Communication-</b> Definition of technical communication, Aspects of technical communication, forms of technical communication, importance of technical communication, technical communication skills (Listening, speaking, writing, reading writing), linguistic ability, style in technical communication.	3
3	<b>Comprehension of Technical Materials/Texts and Information Design &amp; development-</b> Reading of technical texts, Reading and comprehending instructions and technical manuals, Interpreting and summarizing technical texts, Note-making. Introduction of different kinds of technical documents, Information collection, factors affecting information and document design, Strategies for organization, Information design and writing for print and online media.	6
4	<b>Technical Writing, Grammar and Editing-</b> Technical writing process, forms of technical discourse, Writing, drafts and revising, Basics of grammar, common error in writing and speaking, Study of advanced grammar, Editing strategies to achieve appropriate technical style, Introduction to advanced technical communication. Planning, drafting and writing Official Notes, Letters, E-mail, Resume, Job Application, Minutes of Meetings.	8
5	<b>Advanced Technical Writing-</b> Technical Reports, types of technical reports, Characteristics and formats and structure of technical reports. Technical Project Proposals, types of technical proposals, Characteristics and formats and structure of technical proposals. Technical Articles, types of technical articles, Writing strategies, structure and formats of technical articles.	8
<b>Total</b>		<b>26</b>

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## SYLLABUS

2<sup>nd</sup> Year - IV Semester: B.Tech. : Textile Technology

**4TT1-03/3TT1-03: Managerial Economics And Financial Accounting**

**Credit: 2**

**Max. Marks: 100(IA:30, ETE:70)**

**2L+0T+0P**

**End Term Exam: 2 Hours**

SN	Contents	Hours
1	<b>Introduction:</b> Objective, scope and outcome of the course.	1
2	<b>Basic economic concepts-</b> Meaning, nature and scope of economics, deductive vs inductive methods, static and dynamics, Economic problems: scarcity and choice, circular flow of economic activity, national income-concepts and measurement.	4
3	<b>Demand and Supply analysis-</b> Demand-types of demand, determinants of demand, demand function, elasticity of demand, demand forecasting –purpose, determinants and methods, Supply-determinants of supply, supply function, elasticity of supply.	5
4	<b>Production and Cost analysis-</b> Theory of production- production function, law of variable proportions, laws of returns to scale, production optimization, least cost combination of inputs, isoquants. Cost concepts-explicit and implicit cost, fixed and variable cost, opportunity cost, sunk costs, cost function, cost curves, cost and output decisions, cost estimation.	5
5	<b>Market structure and pricing theory-</b> Perfect competition, Monopoly, Monopolistic competition, Oligopoly.	5
6	<b>Financial statement analysis-</b> Balance sheet and related concepts, profit and loss statement and related concepts, financial ratio analysis, cash-flow analysis, funds-flow analysis, comparative financial statement, analysis and interpretation of financial statements, capital budgeting techniques.	5
	<b>Total</b>	<b>25</b>

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## SYLLABUS

2<sup>nd</sup> Year - IV Semester: B.Tech. : Textile Technology

### 4TT3-04: Electronics & Microprocessor In Textile Machines

Credit: 2

Max. Marks: 100(IA:30, ETE:70)

2L+0T+0P

End Term Exam: 2 Hours

SN	Contents	Hours
1	<b>Introduction:</b> Objective, scope and outcome of the course.	1
2	<b>Semiconductor Diodes:</b> Introduction, characteristics and their applications <ul style="list-style-type: none"><li>• Ideal diode, PN semiconductor diode, Diode equivalent circuits</li><li>• Zener diode, Light diodes</li></ul>	4
3	<b>Field Effect Transistors:</b> <ul style="list-style-type: none"><li>• Introduction, Construction and characteristics of JFETS</li><li>• Transfer characteristics, BJT, their characteristics and applications.</li></ul> <b>Transistor Amplifiers:</b> <ul style="list-style-type: none"><li>• Classification of amplifiers, Biasing and compensation techniques</li><li>• R-C coupled amplifier, tuned amplifier, operational amplifier their characteristics and applications.</li><li>• Digital to analog and analog to digital conversion</li></ul>	6
4	<b>Operational Amplifiers (OpAmp):</b> <ul style="list-style-type: none"><li>• Introduction, Block diagram, parameters of OpAmp IC 741</li><li>• OpAmp in inverting and non-inverting configuration,</li><li>• Some applications of OpAmp</li></ul> <b>Semiconductor Devices:</b> <ul style="list-style-type: none"><li>• Introduction of silicon controlled rectifier</li><li>• GTO, TRIAC, DIAC. Injunction transistors, IGBT</li></ul>	6
5	<b>Cathode Ray Oscilloscope:</b> <ul style="list-style-type: none"><li>• Introduction, Cathode ray tube – theory and construction</li></ul> <b>Transducers:</b> <ul style="list-style-type: none"><li>• Introduction, resistive, Inductive, capacitive transducers.</li><li>• Construction and working principle of strain gauge, LVDT, RVDT</li><li>• Summing devices, measurement of linear displacement</li><li>• Pressure measuring using transducers</li><li>• Construction and working of thermocouple and thermistor, measurement of temperature using them.</li></ul> <b>Data Acquisition Systems:</b> Introduction, Components and uses	7
	<b>Process control:</b> <ul style="list-style-type: none"><li>• Application of microprocessors in process control with special emphasis on textiles</li><li>• Minimum microprocessor based system requirement</li></ul> Examples of process control from textile and garment manufacturing engineering	4
	<b>Total</b>	<b>28</b>

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### 4TT4-05: Yarn Manufacturing – II

**Credit: 3**

**Max. Marks: 100(IA:30, ETE:70)**

**3L+0T+4P**

**End Term Exam: 3 Hours**

SN	Contents	Hours
1	<b>Introduction:</b> Objective, scope and outcome of the course.	1
2	Objects of carding, Introduction to roller & clearer card, Detailed study of revolving flat card Constructional features and working details of liker- in, cylinder, doffer and flats.	7
3	Elementary idea about Carding theories. Flexible and metallic card clothing, stripping and grinding. Processing parameters for different materials, Carding defects and their remedies.	8
4	Fiber neps, their assessment and control , Introductory information about modern developments in carding, Control of waste and cleaning in carding Calculations pertaining to draft and production of the machines dealt with course.	8
5	Inertia of a carding machine Objects of drawing. Working principle of draw frame including constructional details. Systems of drafting, weighing in draw frames Mechanical and electrical stop-motions Draft distribution: various types of drafting rollers and their construction Coiling systems: over coiling; under coiling and bicoiling. Concept of ideal draft and formation of drafting waves.	8
6	Principles of roller setting Introduction to modern developments in draw frames Calculations pertaining to draft and production of the machine dealt with course Assessment of performance of card Study of hooks formation, their control, removal and effect of yarn quality Improvement in technology of carding for increased production and improved quality of sliver, high speed carding: designs of carding machines for improved performances Types and basic principal of autolevellers.	8
<b>Total</b>		<b>40</b>

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# RAJASTHAN TECHNICAL UNIVERSITY, KOTA

## SYLLABUS

2<sup>nd</sup> Year - IV Semester: B.Tech. : Textile Technology

### 4TT4-06: Fabric Manufacturing – II

**Credit: 3**

**Max. Marks: 100(IA:30, ETE:70)**

**3L+0T+4P**

**End Term Exam: 3 Hours**

SN	Contents	Hours
1	<b>Introduction:</b> Objective, scope and outcome of the course.	1
2	Warping- object, classification of warping machines. Beam warping- passage, Various mechanisms , Calculation of production and efficiency. Sectional warping machine objects, passage Warping calculation, traverse mech and its calculation	7
3	Types of dobbies, Keighly, Climax, dobe cross doobby, cross border doobby. Preparation of chain for different kinds of design used in dobbies.	8
4	Objects of let-off motion, Negative and positive let-off motion. Warp protecting motion: Loose reed-fast reed, Brake motion.	8
5	Roper and barlet let-off motion with special reference to Cimmco, Ruti and their setting.	8
6	Multiple box motion. Ecles drop box motion. Pick and pick loom with their pattern chain. Side and center weft fork motion, Calculation pertaining to above mechanism.	8
<b>Total</b>		<b>40</b>

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## SYLLABUS

2<sup>nd</sup> Year - IV Semester: B.Tech. : Textile Technology

### 4TT4-07: Fabric Structure

**Credit: 3**

**Max. Marks: 100(IA:30, ETE:70)**

**3L+0T+2P**

**End Term Exam: 3 Hours**

SN	Contents	Hours
1	<b>Introduction:</b> Objective, scope and outcome of the course.	1
2	Methods of Fabric Presentation, Definition and Construction of weave, draft, lifting plan and denting plan. Weave repeat unit and its requirements. Types of drafts viz: straight, skip, pointed and sateen. Definition, Classification, Characteristics, Uses and Construction of Elementary weaves i.e Plain, Twill, Satin and Sateen weaves. Derivatives of Plain Weave.	9
3	Twill Weave classification and Characteristics of twill weave. Derivatives of Twill Weave. Extensions and Modifications of Sateen & Satin weaves.	10
4	Diamond and diaper, Crepe Weave. Mock leno, Honey comb (Ordinary and Brighton), Huck-a- back, Modified Huck-a-back and Reversible Huck-a-back.	8
5	Special Rib and Cord Structures, such as Cork-Screw, Bedford cord, Welt.	6
6	Selection of weaves, Joining of weaves & relative firmness of the weaves. Simple color and weave effects. General considerations, representation, classification and examples.	6
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**4TT4-08: Textile Chemical Processing - II**

**Credit: 2**

**Max. Marks: 100(IA:30, ETE:70)**

**2L+0T+2P**

**End Term Exam: 2 Hours**

SN	Contents	Hours
1	<b>Introduction:</b> Objective, scope and outcome of the course.	1
2	<b>Printing:</b> Introduction to various methods and style of printing of textiles.	4
3	Ingredients of printing past.	5
4	Instruments and machinery used. Introduction to various styles of printing viz. direct, discharge, resist etc.	5
5	<b>Finishing:</b> Object and classification of finishing treatments.	5
6	Application of various types of finishes on different fibres. Elementary knowledge of finishing machines	5
<b>Total</b>		<b>25</b>

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2<sup>nd</sup> Year - IV Semester: B.Tech. : Textile Technology

### PRACTICALS

#### 4TT4-21: Spinning Practical –II

**Credit: 2**

**Max. Marks: 100(IA:60, ETE:40)**

**OL+OT+4P**

Familiarity with carding machine, constructional details, change places, effect of various machine parameters in production and quality of sliver. Checking the quality of silver. Calculation pertaining to card. Card dropping and wastes and their analysis including cleaning efficiency. Practice in checking the quality of lap; and sliver, methods of rectifying defects there in. calculation pertaining to card gearing. Practice in handling, operation, setting and gauging draw frame.

#### 4TT4-22: Weaving Practical –II

**Credit: 2**

**Max. Marks: 100(IA:60, ETE:40)**

**OL+OT+4P**

Practice in handling and operating beam and sectional warping machine and passage with their speed and production calculation, Secondary motion take –up & Let off motion . Speed calculation & \* production 5 wheel & 7 wheel take –up, motion. Warp protecting motion side & centre weft fork motion. & Reed speed calculation, Negative climax dobbling & eccles drop box.

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### 4TT4-23: Fabric Structure Lab

**Credit: 1**

**Max. Marks: 100(IA:60, ETE:40)**

**OL+OT+4P**

Basic principles of woven fabric analysis and estimation of data for cloth reproduction. Recognition of fabric and yarns and materials used in their construction, weave analysis, sett, count and weight calculations for simple woven structures. Specifications for standard woven fabric.

### 4TT4-24: Textile Chemical Processing Lab-II

**Credit: 1**

**Max. Marks: 100(IA:60, ETE:40)**

**OL+OT+4P**

Application of different stiffening agents, softening chemicals on cotton fabric. Application of Anti creasing agents, water proofing, water repellents and flame retardant chemicals on cotton and blended fabrics. Preparation of printing paste. Printing of cotton fabric with different styles and methods of printing.

### 4TT8-00 SOCIAL OUTREACH, DISCIPLINE & EXTRA CURRICULAR ACTIVITIES

**Credit: 0.5**

**Max. Marks: 100**

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