

Scheme & Syllabus of
UNDERGRADUATE DEGREE COURSE

B.Tech. VII & VIII Semester

Textile Technology



Rajasthan Technical University, Kota
Effective from session: 2020-21



RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Scheme & Syllabus

IV Year- VII & VIII Semester: B. Tech. (Textile Technology)

Teaching & Examination Scheme

B.Tech. : Textile Technology

4th Year – VII Semester

THEORY											
SN	Categ ory	Course		Contact hrs/week			Marks				Cr
		Code	Title	L	T	P	Exm Hrs	IA	ETE	Total	
1	PEC	7TT5-11	Multi Fibre Spinning	3	0	0	3	30	70	100	3
		7TT5-12	Functional & Technical Textiles								
		7TT5-13	Clothing Science and Technology								
2	OE		Open Elective I	3	0	0	3	30	70	100	3
		Sub Total		6	0	0		60	140	200	6
PRACTICAL & SESSIONAL											
3	PCC	7TT4-21	Spinning Practical – V	0	0	4	3	60	40	100	2
4		7TT4-22	Weaving Practical- V	0	0	4	3	60	40	100	2
5	PSIT	7TT7-30	Industrial Training	1	0	0	3	60	40	100	2.5
6		7TT7-40	Seminar	2	0	0	2	60	40	100	2
7	SODE CA	7TT8-00	Social Outreach, Discipline & Extra Curricular Activities						100	100	0.5
		Sub- Total		3	0	8		240	260	500	9.0
		TOTAL OF VII SEMEESTER		9	0	8		300	400	700	15

L: Lecture, **T:** Tutorial, **P:** Practical, **Cr:** Credits

ETE: End Term Exam, **IA:** Internal Assessment



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B.Tech. : Textile Technology

4th Year – VIII Semester

THEORY											
SN	Categor y	Course		Contact hrs/week			Marks				Cr
		Code	Title	L	T	P	Exm Hrs	IA	ETE	Total	
1	PEC	8TT5-11	Developments in Manmade Fibre Production	3	0	0	3	30	70	100	3
2		8TT5-12	Modern method of yarn production								
3		8TT5-13	Developments in Fabric Production								
4	OE		Open Elective II	3	0	0	3	30	70	100	3
		Sub Total		6	0	0		60	140	200	6
PRACTICAL & SESSIONAL											
5	PCC	8TT4-21	Spinning Practical – VI	0	0	2	2	60	40	100	1
6		8TT4-22	Weaving Practical- VI	0	0	2	2	60	40	100	1
7	PSIT	8TT7-50	Project	3	0	0		60	40	100	7
8	SODE CA	8TT8-00	Social Outreach, Discipline & Extra Curricular Activities						100	100	0.5
		Sub- Total		3	0	4		180	220	400	9.5
		TOTAL OF VIII SEMEESTER		9	0	4		240	360	600	15.5

L: Lecture, **T:** Tutorial, **P:** Practical, **Cr:** Credits,

ETE: End Term Exam, **IA:** Internal Assessment



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B Tech (Textile Technology) Honours

A student will be eligible to get **B Tech (Textile Technology) (Honours)**, if he/she completes additional **20 credits**. These could be acquired through MOOCs.

B Tech (Textile Technology) Honours

SN	Category	Course Code	Course Title	Credits
1	MC	TT9-01	NPTEL , IIT Madras, nptel.ac.in	As per credit of course
2		TT9-02	mooKIT, IIT Kanpur , www.mookit.co	As per credit of course
3		TT9-03	IITBX, IIT Bombay, iitbombayx.in	As per credit of course
4		TT9-04	SWAYAM, MHRD & Microsoft, swayam.gov.in	As per credit of course
Total				20



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List of Open Electives for Textile Technology			
Subject Code	Title	Subject Code	Title
Open Elective - I		Open Elective - II	
7AG6-60.1	Human Engineering and Safety	8AG6-60.1	Energy Management
7AG6-60.2	Environmental Engineering and Disaster Management	8AG6-60.2	Waste and By-product Utilization
7AN6-60.1	Aircraft Avionic System	8AN6-60.1	Finite Element Methods
7AN6-60.2	Non-Destructive Testing	8AN6-60.2	Factor of Human Interactions
7CH6-60.1	Optimization Techniques	8CH6-60.1	Refinery Engineering Design
7CH6-60.2	Sustainable Engineering	8CH6-60.2	Fertilizer Technology
7CR6-60.1	Introduction to Ceramic Science & Technology	8CR6-60.1	Electrical and Electronic Ceramics
7CR6-60.2	Plant, Equipment and Furnace Design	8CR6-60.2	Biomaterials
7CE6-60.1	Environmental Impact Analysis	8CE6-60.1	Composite Materials
7CE6-60.2	Disaster Management	8CE6-60.2	Fire and Safety Engineering
7CS6-60.1	Quality Management/ISO 9000	8CS6-60.1	Big Data Analytics
7CS6-60.2	Cyber Security	8CS6-60.2	IPR, Copyright and Cyber Law of India
7EE6-60.1	Electrical Machines and Drives	8EE6-60.1	Energy Audit and Demand side Management
7EE6-60.2	Power Generation Sources.	8EE6-60.2	Soft Computing
7EC6-60.1	Principle of Electronic communication	8EC6-60.1	Industrial and Biomedical applications of RF Energy
7EC6-60.2	Micro and Smart System Technology	8EC6-60.2	Robotics and control
7ME6-60.1	Finite Element Analysis	8ME6-60.1	Operations Research
7ME6-60.2	Quality Management	8ME6-60.2	Simulation Modeling and Analysis
7MI6-60.1	Rock Engineering	8MI6-60.1	Experimental Stress Analysis
7MI6-60.2	Mineral Processing	8MI6-60.2	Maintenance Management
7PE6-60.1	Pipeline Engineering	8PE6-60.1	Unconventional Hydrocarbon Resources
7PE6-60.2	Water Pollution control Engineering	8PE6-60.2	Energy Management & Policy



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IV Year- VII & VIII Semester: B. Tech. (Textile Technology)

7TT5-11: Multi Fibre Spinning

Credit: 3

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

3L+0T+0P

End Term Exam: 3 Hours

SN	Contents	Hours
1	Introduction: Objective, scope and outcome of the course.	1
2	Survey of established practices for the spinning of manmade fibres using different spinning systems with emphasis of fiber and yarn properties	8
3	Detailed study of the cotton system process for spinning of man-made fibres and fibre assemblies Properties involving engineering principles	9
4	Blending techniques for various man-made and natural fibres, problems in Blending Blended yarn properties and fabric performance Introduction of Sericulture- Mulberry, Tassar and Eri silk, Properties of silk and Silk spinning Spinning of wool (woolen and worsted system.)	9
5	Cotton Waste: Types, classification and end-uses Study of machines and methods employed in the production of waste yarns(coiled system and condenser system).Recycled Fiber	9
6	Introduction to jute and linen spinning process.	4
	Total	40



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IV Year- VII & VIII Semester: B. Tech. (Textile Technology)

7TT5-12: FUNCTIONAL & TECHNICAL TEXTILES

Credit: 3
3L+0T+0P

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

End Term Exam: 3 Hours

SN	Contents	Hours
1	Introduction: Objective, scope and outcome of the course.	1
2	Filtration: Principles and some mathematical models of wet and dry filtrations. Characteristics properties of fibres and fabrics in selective examples of filtration.	6
3	Geotextiles: Mechanics of reinforcement, filtration and drainage of soils by geotextiles. Typical applications.	6
4	Medical textiles: Textiles in various medical applications. Absorbency of textile materials & methods of sterilization. Materials used and design procedure for protecting wounds, cardiovascular application, Sutures.	7
5	Automotive Textiles: Fibres used for automotive applications- upholstery, carpeting, preformed parts, tyres, safety devices, filters and engine compartment items. Brief description for the manufacture and application of these devices or parts.	6
6	Rigid composites: Three dimensional fabrics and triaxially braided materials for composites.	4
7	Ropes and Cordages: Methods of production. Application oriented structure and production of ropes, cordages and twines.	4
8	Protective clothing: Thermal protection. Ballistic protection. Protection from electromagnetic radiation and static hazards. Protection against micro-organisms, chemicals and pesticides.	6
	Total	40



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IV Year- VII & VIII Semester: B. Tech. (Textile Technology)

7TT5-13: Clothing Science and Technology

Credit: 3

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

3L+0T+0P

End Term Exam: 3 Hours

SN	Contents	Hours
1	Introduction: Objective, scope and outcome of the course.	1
2	Concept of comfort factors involved in the study of clothing Selection Criteria for a Garment	7
3	Planning, drawing and reproduction of the marker Requirements & Methods of marker-planning Spreading Requirements & Methods of Spreading Objectives and methods of cutting. Requirements of cutting. Nature of fabric packages	8
4	Seam types, properties & uses of seams, Stitch types, formation of stitches & their uses. Sewing defects.	8
5	Alternative Methods of Joining Materials Fusing, Welding & Adhesives, Moulding Pressing Purpose of pressing, pressing equipment and methods	8
6	Objective hand evaluation and tailorability assessment of the fabric Brief introduction to garment processing – Denim processing.	8
	Total	40



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IV Year- VII & VIII Semester: B. Tech. (Textile Technology)

7TT4-21: SPINNING PRACTICAL -V

Credit: 2
OL+OT+4P

Max. Marks: 100(IA:60, ETE:40)
End Term Exam: 3 Hours

Contents
Spinning Practical Familiarity with established processing parameters for producing carded combed, blended, folded and fancy yarns. Practice in handling, operating, setting and gauging Rotor Spining frame, Air- Jet Spinning and friction spinning

7TT4-22: WEAVING PRACTICAL –V

Credit: 2
OL+OT+4P

Max. Marks: 100(IA:60, ETE:40)
End Term Exam: 3 Hours

Contents
Mechanism of secondary, auxiliary motions and beam gaiting of projectile weaving and Air-Jet machines.. Study of constructional details of tape loom. Practice in weaving and knitting and checking the quality of fancy fabric and method of rectifying the defect. Light theory, Pigment theory, Complementary colors, Chromatic circle, Brewster circle, coloured grey.



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IV Year- VII & VIII Semester: B. Tech. (Textile Technology)

7TT7-30: INDUSTRIAL TRAINING

Credit: 2.5

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

OL+OT+1P

End Term Exam: 2 Hours

Contents

Each student, individual or in association with some other students at the end of the Third B.TECH. course will observe and collect the general and technical information pertaining to machinery, raw materials used, yarns and fabrics produced by the textile mills, in which he/she/they are undertaking 8 weeks' practical training. Each student will have to submit a written/typed report duly approved and signed by the guide to the Head of the department.

7TT7-40: SEMINAR

Credit: 2

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

1L+0T+0P

End Term Exam: 2 Hours

Contents

Topic - In the beginning of the semester, every student of the class will be assigned a seminar topic in the emerging / perspective field in the area of textiles such as Spinning, Weaving, Fibres, Testing, Chemical processing and alike. Seminar should be based on the literature survey on any topic of textiles. Seminar Preparation and Presentation – Student will collect the information on the above subjects and submit the report on the dates specified by the concerned faculty. The seminar report will be of minimum 15 pages and maximum 25 pages. The spacing between the lines will be 1.5. The font size will be 12 point Times New Roman. The list of reference must be given at the end of seminar report as prescribed on RTU Website. The student has to present seminar in front of the faculty member of the department of textile technology and his/her classmates. The faculty member, based on the quality of the work and preparation and understanding of the candidate, shall do an assessment of the seminar internally.

7TT8-00: SOCIAL OUTREACH, DISCIPLINE & EXTRA CURRICULAR ACTIVITIES

Office of Dean Academic Affairs
Rajasthan Technical University, Kota



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8TT5-11: DEVELOPMENTS IN MANMADE FIBER PRODUCTION

Credit: 3

3L+0T+0P

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

End Term Exam: 3 Hours

SN	Contents	Hours
1	Introduction: Objective, scope and outcome of the course.	1
2	Problems and difficulties associated with conventional fibres. Modified synthetic fibres like: antistatic, hydrophilic, low pill, flame retardant, biodegradable, carrier free, cationic, deep, differentially dyeable, silk like polyester, nylon, acrylic, poly-propylene and evaluation of their properties.	10
3	Manufacturing practices for fibres such as multilobal, hollow, micro voids, micro-grooves, bi-component, conjugated and microfibres fibres and evaluation of their properties, Developments in extrusion and post extrusion processes of synthetic fibres.	8
4	Spun bonding and melt blowing processes.	6
5	Raw material preparation, polymerisation techniques and fibre manufacturing processes of elastomeric, non conventional and high performance fibres like polyurathane, aramid, ordered polymeric, aromatic polyesters, ultra high molecular weight polyethylene, carbon, glass, ceramic, optical fibres with their structure, properties and application areas	15
	Total	40



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8TT5-12: MODERN METHOD OF YARN PRODUCTION

Credit: 3

3L+0T+2P

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

End Term Exam: 3 Hours

SN	Contents	Hours
1	Introduction: Objective, scope and outcome of the course.	1
2	Causes leading to the advent of unconventional systems of spinning Classification of unconventional methods of yarn production	7
3	Mechanism of yarn formation on rotor spinning Effect of rotor machine variables and fibre properties on the properties of rotor spun yarns Limitation of rotor spinning Advances in rotor spinning	12
4	Study of other open-end spinning systems Friction spinning Electrostatic spinning	6
5	Air-vortex spinning Mechanism of yarn formation Structure, properties and end uses of yarns spun on Air-jet spinning	6
6	Principle of wrap spinning Twist less spinning Self-twist spinning Compact spinning Ring spinning Structure, properties and end uses of these yarns Potential and limitations of various spinning technologies	8
	Total	40



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STT5-13: DEVELOPMENTS IN FABRIC PRODUCTION

Credit: 3

3L+0T+2P

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

End Term Exam: 3 Hours

SN	Contents	Hours
1	Introduction: Objective, scope and outcome of the course.	1
2	Narrow Fabric Weaving :Introduction, Scope of narrow fabric weaving, applications Gauge and leno structure with their mechanism Madras Muslin structures	7
3	Type of Carpets and classification, Hand knitted carpets, tufted Carpets, Knitted Carpets, Stitch Bonded Carpets, Electrostatic flocking Carpets	6
4	Braiding: Introduction, classification (rounds and flat braids), applications, raw material used for braids, machines used for braiding (drive, yarn supply, Braiding technology, take up. Gauge and leno structure with their mechanism. Madras Muslin structures Some common fabrics like Lappets, Swivels, Ondule Fabrics, Tuck fabrics, woven pile fabrics produced by thermal shrinkage	8
5	Industrial fabrics especially kind of canvases, Belts, Parachute Fabrics and umbrella cloth. Lycra Fabric	6
6	Non-woven fabrics Introduction to nonwoven fabrics and techniques. Web Forming Techniques: carding, Garnetting, air laid, wet process, polymer extrusion. Classification of nonwoven – On the basis of use, on the basis of manufacturing process, on the basis of web formation, on the basis of bonding. Dry laid webs Wet laid nonwoven Spun laced webs Mechanically bonded webs – needle punched nonwovens, stitch bonded nonwovens Hydro entangled nonwovens properties of spun laced webs, applications. Chemically bonded nonwoven application of chemical bonded nonwovens Thermally bonded nonwovens Melt blown nonwovens	12
	Total	40



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8 TT4-21: SPINNING PRACTICAL -VI

Credit: 1

OL+OT+2P

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

End Term Exam: 2 Hours

Contents
Collection and interpretation of data for process control in Blowroom, card, drawframe, simplex, ringframe and TFO and comparing the same with established norms. Study of the defects at various stages of spinning.

8TT4-22: WEAVING PRACTICAL -VI

Credit: 1

OL+OT+2P

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

End Term Exam: 2 Hours

Contents
Familiarity with the temperature and humidity in different department and methods of controlling the same. Oiling and maintenance schedules. Work load assignments in different department. Familiarity with established processing parameters for weaving. Stoppage and Snap studies. Practice on dobby & jacquard based weaving designs software's Preparation of draft, designs and peg plans for various types of designs. Practice on printing software, color separation, screen preparation. Use of scanners.



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8TT7-50: PROJECT

Credit: 7
3L+0T+0P

Max. Marks: 100(IA:60, ETE:40)
End Term Exam: 4 Hours

Contents

Each Student individually, or in association with some other students will carry out project of an experimental and/ or theoretical nature in one of the main areas textile technology and present his finding in a systematic in the report form duly approved and signed by his supervisors/Guide(to be nominated by the Head of the Departments/Institutes). Each candidates would submit 3 typed copies of project report to the head of the department/institution at least 15 days before the commencement of second semester examination after viva-voce examinations. The original report and a carbon copy will be retained by the concerned department/institution and the supervisor respectively.

8TT8-00 SOCIAL OUTREACH, DISCIPLINE & EXTRA CURRICULAR ACTIVITIES