

Scheme & Syllabus of  
UNDERGRADUATE DEGREE COURSE

**B.Tech. VII & VIII Semester**

**Textile Chemistry**



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



# RAJASTHAN TECHNICAL UNIVERSITY, KOTA

## Scheme & Syllabus

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

### Teaching & Examination Scheme

### B.Tech. : Textile Chemistry

### 4<sup>th</sup> Year – VII Semester

THEORY											
SN	Category	Course		Contact hrs/week			Marks			Cr	
		Code	Title	L	T	P	Exm Hrs	IA	ETE		Total
1	PCC	7TC4-01	Technology of Textile Finishing	3	0	0	3	30	70	100	3
2	OE		Open Elective I	3	0	0	3	30	70	100	3
<b>Sub Total</b>				<b>6</b>	<b>0</b>	<b>0</b>		<b>60</b>	<b>140</b>	<b>200</b>	<b>6</b>
PRACTICAL & SESSIONAL											
3	PCC	7TC4-21	Textile Printing Lab-II	0	0	4	3	60	40	100	2
4		7TC4-22	Technology of Textile Finishing Lab	0	0	4	3	60	40	100	2
5	PSIT	7TC7-30	Industrial Training	1	0	0	3	60	40	100	2.5
6		7TC7-40	Seminar	2	0	0	2	60	40	100	2
7	SODE CA	7TC8-00	Social Outreach, Discipline & Extra Curricular Activities	0	0	0			100	100	0.5
<b>Sub- Total</b>				<b>3</b>	<b>0</b>	<b>8</b>		<b>240</b>	<b>260</b>	<b>500</b>	<b>9</b>
<b>TOTAL OF VII SEMEESTER</b>				<b>9</b>	<b>0</b>	<b>8</b>		<b>300</b>	<b>400</b>	<b>700</b>	<b>15</b>

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

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



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## Scheme & Syllabus

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

### Teaching & Examination Scheme

#### B.Tech. : Textile Chemistry

#### 4<sup>th</sup> Year – VIII Semester

THEORY											
SN	Category	Course		Contact hrs/week			Marks				Cr
		Code	Title	L	T	P	Exm Hrs	IA	ETE	Total	
1	PEC	8TC5-11	Chemical Processing of Synthetics and Blends	3	0	0	3	30	70	100	3
2		8TC5-12	Advancement in Textile Chemical Processing								
3	OE		Open Elective II	3	0	0	3	30	70	100	3
<b>Sub Total</b>				<b>6</b>	<b>0</b>	<b>0</b>		<b>60</b>	<b>140</b>	<b>200</b>	<b>6</b>
PRACTICAL & SESSIONAL											
4	PCC	8TC4-21	Computer Color Matching Lab	0	0	2	2	60	40	100	1
5		8TC4-22	Dyeing of Synthetics and Blends Lab	0	0	2	2	60	40	100	1
6	PSIT	8TC7-50	Project	3	0	0		60	40	100	7
7	SODE CA	8TC8-00	Social Outreach, Discipline & Extra Curricular Activities						100	100	0.5
<b>Sub- Total</b>				<b>3</b>	<b>0</b>	<b>4</b>		<b>180</b>	<b>220</b>	<b>400</b>	<b>9.5</b>
<b>TOTAL OF VIII SEMEESTER</b>				<b>9</b>	<b>0</b>	<b>4</b>		<b>240</b>	<b>360</b>	<b>600</b>	<b>15.5</b>

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# RAJASTHAN TECHNICAL UNIVERSITY, KOTA

## Scheme & Syllabus

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

### B Tech (Textile Chemistry) Honours

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

### B Tech (Textile Chemistry) Honours

SN	Category	Course Code	Course Title	Credits
1	MC	TC9-01	NPTEL , IIT Madras, nptel.ac.in	As per credit of course
2		TC9-02	mooKIT, IIT Kanpur , www.mookit.co	As per credit of course
3		TC9-03	IITBX, IIT Bombay, iitbombayx.in	As per credit of course
4		TC9-04	SWAYAM, MHRD & Microsoft, swayam.gov.in	As per credit of course
<b>Total</b>				<b>20</b>



# RAJASTHAN TECHNICAL UNIVERSITY, KOTA

## Scheme & Syllabus

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

<b>List of Open Electives for Textile Chemistry</b>			
<b>Subject Code</b>	<b>Title</b>	<b>Subject Code</b>	<b>Title</b>
<b>Open Elective - I</b>		<b>Open Elective - II</b>	
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



# RAJASTHAN TECHNICAL UNIVERSITY, KOTA

## Scheme & Syllabus

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

### 7TC4-01: TECHNOLOGY OF TEXTILE FINISHING

**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	Classification of various finishes  Various semi permanent, permanent finishes e.g. starch finish, wash and wear, easy care finish, formaldehyde free finishes, anti shrink finish, water repellent finish, water proof finish, rot and mildew proof, soil release, fire retardant finishes for natural fibers	7
3	Organdie, Zero -Zero finish and softening of textile materials.  Low liquor application techniques like foam finishing  Weighting of silk, scroop finish on silk fabrics	8
4	Finishing of woolen textile materials e.g. blankets, shawls, blazers  Moth proofing of woolen materials	8
5	Finishing of synthetics and union fabrics e.g. 100% polyester, nylons, acrylics and their blends with cotton, viscose, wool	8
6	Heat setting of various synthetics and union fabrics  Finishing machinery's e.g. Stenter, Calendar, Sanforising, Decatising	8
	<b>Total</b>	<b>40</b>



# RAJASTHAN TECHNICAL UNIVERSITY, KOTA

## Scheme & Syllabus

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

### 7TC4-21: TEXTILE PRINTING LAB -II

**Credit: 2**  
**OL+OT+4P**

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

#### Contents

Printing of polyester and its blends by using different methods and styles of printing.  
Screen preparation for manual and rotary screen printing machines.  
Printing of polyester, cotton and its blends by using of Pigment colours.  
Evaluation of thicker.

### 7TC4-22: TECHNOLOGY OF TEXTILE FINISHING LAB

**Credit: 2**  
**OL+OT+4P**

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

#### Contents

Finishing of cotton, wool, silk, and linen.  
Finishing of textiles to obtain different effect viz. crease resistance, water repellent, flame retardant, softening, stiffening, soil release, antistatic etc.  
Bio polishing of cotton fabrics, teflon finishes etc. Finishing of synthetics and blended fabrics. Study of heat setting and its evaluation

### 7TC7-30:INDUSTRIAL TRAINING

**Credit: 2.5**  
**1L+OT+0P**

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

Office of Dean Academic Affairs  
Rajasthan Technical University, Kota



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### 7TC7-40: SEMINAR

**Credit: 2**  
**2L+0T+0P**

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

### 7TC8-00: SOCIAL OUTREACH, DISCIPLINE & EXTRA CURRICULAR ACTIVITIES

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## Scheme & Syllabus

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

### STC5-11: CHEMICAL PROCESSING OF SYNTHETICS AND BLENDS

**Credit: 3**

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

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

**End Term Exam: 3 Hours**

SN	Contents	Hours
1	Introduction: Objective, scope and outcome of the course.	1
2	Pretreatments and dyeing of Polyester, Polyester/Cellulose, Polyester /Wool blends by batch, semicontinuous, and continuous dyeing methods	7
3	Dyeing of nylon with various classes of dyes , barre and its rectification, dyeing of nylon blends, leveling agents for nylon dyeing Dyeing of acrylic fiber with new basic dyes, faults and remedy, retarders	8
4	Dyeing of micro fiber fabrics, textured yarn and fabrics Dyeing of new fiber vizLyocell, Lycra, Modal Mass coloration of polyester, nylon, acrylics, polypropylene and viscose fibers.	8
5	Finishing of synthetics and union fabrics e.g. 100% polyester, nylons, acrylics and their blends with cotton, viscose, wool Weight reduction of polyester fabrics, silk like polyester Finishing of sarees, dress materials Flame retardant finishes for polyester-cotton blends, wool, nylon and FR fibers	8
6	Antistatic finishes, soil release finishes, water proofing and breathable fabrics Formaldehyde free finishes' Dyeing and finishing machines e.g. Jet dyeing machine, Soft flow jet dyeing machine, Stenter machine.	8
	<b>Total</b>	<b>40</b>



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## Scheme & Syllabus

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

### 8TC5-12: ADVANCEMENT IN TEXTILE CHEMICAL PROCESSING

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.	01
2	Continuous desizing, scouring and bleaching pretreatments. Combined desizing, scouring and bleaching treatments. Eco friendly per acetate and hydrogen peroxide bleaching and peroxide bath stabilizers. Liquid ammonia mercerization.	8
3	Continuous dyeing with Reactive, Vat and Disperse dyes. Machinery requirement in continuous dyeing. E control Dyeing.	8
4	New developments in Reactive dyes such as HF dyes, low salt and no salt Reactive dyes and multifunctional dyes. Photo chromic dyes and thermo chromic dyes. Rapid dyeing of polyester fabrics.	7
5	Nano finishing chemicals and their application to textile substrate. Plasma finishing technology, low wet pick up technology. Formaldehyde free finishes.	8
6	Water repellent and breathable fabrics. Flame retardants finishes. Ultraviolet protection finishes .Antibacterial finish. Rotary screen printing, Transfer Printing and Digital Printing Technology.	8
	<b>Total</b>	<b>40</b>



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

### 8TC4-21 COMPUTER COLOR MATCHING LAB

**Credit: 1**  
**OL+OT+2P**

**Max. Marks: 100(IA:60, ETE:40)**  
**End Term Exam: 2 Hours**

#### Contents

Experiments based on measuring optical density, transmittance etc.  
Study the reflectance curves of various colored samples, munsell color order system and hue, value, chroma, CIE illuminants, standard observers, tristimulus values, chromaticity coordinates, L a b values, K/S values, Strength measurement, whiteness and yellowness index, color difference, metamerism, staining and shade change.

Preparation of primary datas for shade matching, shade correction

### 8TC4-22 DYEING OF SYNTHETICS AND BLENDS LAB

**Credit: 1**  
**OL+OT+2P**

**Max. Marks: 100(IA:60, ETE:40)**  
**End Term Exam: 2 Hours**

#### Contents

Dyeing of various synthetic fibers e.g. polyester, nylon, acrylic blends with various classes of dyes.

Shade matching on cellulosics with vat, reactive and sulphur dyes



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### 8TC7-50 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 area of textile chemistry and present him fin ding is a systematic in the report form duty 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.

### 8TC8-00 SOCIAL OUTREACH, DISCIPLINE & EXTRA CURRICULAR ACTIVITIES

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