



SARVAJANIK UNIVERSITY
Sarvajani College of Engineering and
Technology
Bachelor of Engineering



B E II Textile Technology: Semester – III
Subject Name: Fibre Physics Subject Code: BTTT11301

Type of course: BSC/ESC/HSM/PCC/PEC/OEC/MD

Prerequisite (if any): Basic knowledge of physics, chemistry and textile fibres

List of Courses where this course will be prerequisite:

Rationale: (should also include Description of the relevance of this course in the Program):

Fibre is the only raw material used for all activities of textile. The fibres are varied in nature and properties due to the way they are either available or produced. It is very important to study physical properties of fibres so that their behavior in later on processes and properties of end product can be understood in better way.

Teaching and Examination Scheme:

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
3	0	0	3	60	25	15	0	0	100

CA1: Continuous Assessment (assignments/projects/open book tests/closed book tests CA2: Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems TEE: Term End Examination TEP: Term End Practical Exam (Performance and viva on practical skills learned in course) CA3: Regular submission

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BSC: basic science course /ESC: Engineering Science Course /HSM: Humanities and management /PCC: Professional Core course /PEC: professional Elective course /OEC: Open Elective course/ MD: mandatory non-credit course



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of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course

Content:

Sr. No.	Content	Total Hrs
1	Introduction to Fibre Structure Investigation methods of fibre structure and their limitations; Microscopic methods: Electron microscope (SEM, TEM); X-ray diffraction methods (WAXS, SAXS); Optical birefringence; Infrared spectroscopy (FTIR); Density measurements. Nuclear magnetic resonance, The general problem of fibre structure, Fine and morphological structure of: natural-cellulose fibres; regenerated and modified celluloses; protein fibres; synthetic fibres	14
2	Moisture Absorption Properties Definitions of humidity; moisture regain, moisture content, Equilibrium, Measurement of regain, Relation between regain and relative humidity, Effect of stress and temperature on regain, Heat of sorption; Swelling of fibres	9
3	Tensile Properties Definitions: breaking strength, breaking extension, tensile stress, tensile strain, mass specific stress, yield point, initial modulus, secant modulus, work of rupture and work factor; Stress-strain curves for various textile fibres and their significance. Factors influencing tensile properties of fibres; Elastic properties; The study of time dependence, Creep, Definitions of torsional rigidity and flexural rigidity	9
4	Optical and Frictional Properties	7

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	Definitions of refractive index, birefringence & orientation; Reflection and luster; Fibre friction; Theories of friction – Amonton’s law; Measurement of friction and factors influencing fibre friction; Friction in wool;	
5	Electrical and Thermal Properties Definitions of dielectric properties, Definitions of electrical resistance, Measurement of electrical resistance of fibres; Thermal parameters(specific heat of fibres, thermal conductivity, expansion and contraction), Irreversible shrinkage, Thermal transitions, The secondary transitions in fibres, Melting and multiple melting phenomena	6

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
10	20	15	5	5	5

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom’s Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Reference Books:

Sr no	Title of book /article	Author(s)	Publisher and details like ISBN	Year of publication	Publication Edition

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1.	Physical Properties of Textile Fibres,	W. E. Morton and J. W. S Hearle.	Woodhead Publishing Series in Textiles 1845692209, 9781845692209	2008	
2.	Textile Science,	E.P.G. Gohl and L.D.Vilensky.	Longman Cheshire 0582685958, 9780582685956	1983	
3.	Microscopy of Textile Fibre,	Greaves & Saville	BIOS Scientific Publishers, 1872748244, 9781872748245	31 मई 1995	
4.	Manufactured Fibre Technology,	V.B.Gupta and V.K.Kothari	Springer Science & Business Media 9401158541, 9789401158541	2012	

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Course Outcomes:

Sr. No.	CO statement	Marks weightage	%
CO-1	Describe the fine and morphological structure of various fibres.	22	
CO-2	Interpret the moisture absorption properties of different fibres.	22	
CO-3	Evaluate tensile properties of different fibres.	16	
CO-4	Distinguish the optical and frictional properties of different fibres.	5	
CO-5	Differentiate the electrical and thermal properties of various fibres.	5	

Mapping with POs:

	P O 1	P O 2	P O 3	P O 4	P O 5	P O 6	P O 7	P O 8	P O 9	P O 10	P O 11	P O 12	P S O 1	P S O 2	P S O 3
CO-1	3	1	0	1	0	0	0	0	0	0	0	0	3	3	3
CO-2	3	3	0	3	2	0	0	0	0	0	0	0	3	3	3
CO-3	3	2	0	2	2	0	0	0	0	0	0	0	3	3	3
CO-4	3	2	0	2	2	0	0	0	0	0	0	0	3	3	3

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CO-5	3	2	0	2	2	0	0	0	0	0	0	0	3	3	3
Rationale*	3	2	0	2	2	0	0	0	0	0	0	0	3	3	3

Rationale*: Explaining why it is matching this particular program outcome

Matching in outcome is it needs basic knowledge of the textile process and science in general.

List of Open learning website: <http://nptel.iitm.ac.in>; google search engine.

List of Open Source Software:

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