

# U.P TECHNICAL UNIVERSITY, LUCKNOW

## Study and Evaluation scheme

### B. Tech. Textile Technology

[Effective from the Session 2015-16]

YEAR 3<sup>rd</sup> , SEMESTER- V

S. No.	Subject Code	Name of Subject	Periods			Evaluation Scheme				Subject Total	Credits
			L	T	P	Sessional Assessment			ESE		
						CT	TA	Total			
<b>THEORY SUBJECT</b>											
1	NTT-501	Textile Testing-I	3	1	0	30	20	50	100	150	4
2	NTT-502	Yarn Manufacture-III	3	1	0	30	20	50	100	150	4
3	NTT-503	Fabric Manufacture-III	3	1	0	30	20	50	100	150	4
4	NTT-504	Colour & Design	3	1	0	30	20	50	100	150	4
5	NTT-505	Fabric Structure	2	1	0	15	10	25	50	75	3
6		HS	2	0	0	15	10	25	50	75	2
<b>PRACTICAL/ DESIGN/DRAWING</b>											
7	NTT-551	Textile Testing-I Lab	0	0	3	10	10	20	30	50	1
8	NTT-552	Yarn Manufacture-III Lab	0	0	3	10	10	20	30	50	1
9	NTT-553	Fabric Manufacture -III Lab	0	0	2	10	10	20	30	50	1
10	NTT-555	Fabric Analysis Lab	0	0	2	10	10	20	30	50	1
11	NGP-501	General Proficiency								50	
		<b>Total</b>	<b>16</b>	<b>5</b>	<b>10</b>					<b>1000</b>	<b>25</b>

\*HS: To be decided by UPTU



## 5<sup>th</sup> Semester B. Tech. Textile Technology

### 1. Textile Testing-I (NTT-501) (L T P 3 1 0) Credits = 4

**Unit (1):** Introduction to fiber, yarn and fabric testing, sampling, random sampling, biased sampling, sampling techniques, square and cut-square technique, selection of sample for testing.

**Total Lectures required =8**

**Unit (2):** Atmospheric conditions for testing, absolute and relative humidity, moisture regain & moisture content and their measurement, dry and wet bulb hygrometer, importance of moisture in textiles, effect of moisture on properties (physical, & mechanical) of textile material, factors affecting the regain, Shirley moisture meter, control of atmospheric conditions during testing.

**Total Lectures required =9**

**Unit (3):** Measurement of physical characteristics of cotton viz. length, fineness, maturity, bundle strength, colour and foreign matter including principle, construction, operation, and calibration of the equipment in common use.

**Total Lectures required =8**

**Unit (4):** Mechanical properties of fibres, relation between structure and mechanical properties of fibres, Measurement of physical properties of man-made fibres i.e. length, denier, strength, elongation, modulus, work of rupture, crimp, spin finish, fibre quality index etc.

**Total Lectures required =8**

**Unit (5):** determination of yarn count, diameter, resultant count of folded yarn, relation between Ne, D, T, Nm, Instruments used for determination of count, quadrant balance, Knowles balance, Beesley balance and physical balance, Twist, classification of twist, twist measurement, direct counting method, continuous twist tester, twist-untwist method, Twist tester, R.B. twist tester, level of twist.

**Total Lectures required =9**

**Grand total of lectures required = 42**

**Text Books and Reference material:**

1. Quality control and testing management, by V.K. Kothari
2. Principles of textile testing, by J.E. Booth
3. Physical testing of textiles, by B.P. Savile
4. Physical properties of fibres, by W.E. Morton and J.W.S. Hearle

Laboratory work: As per lab syllabus

### 2. Yarn Manufacturing-III (NTT-502) (L T P 3 1 0) Credits = 4

**Unit (1):** Objectives of combing, system of lap preparation, sliver lap, ribbon lap and super lap machines, configuration of fibre feed and its effect on the quality of product and efficiency of comber, combing cycle.

**Total Lectures required =8**

**Unit (2):** Important parts of comber and their functioning, timing and setting of comber for different classes of cotton, concept of forward and backward feed, concept of comber waste, calculation pertaining to production and noil percentage, recent developments in combers.

**Total Lectures required =9**

**Unit (3):** Objectives of speed frame, important parts of speed frame and their functioning, Mechanism involved in drafting, twisting, and winding, different types of roler drafting systems, setting and gauges in drafting zone.

**Total Lectures required =8**

Unit (4): Mechanism of bobbin building, process parameters for different materials, basic principle of designing of cone drum, differential motions and their working principles. Recent developments in speed frame.

**Total Lectures required =8**

**Unit (5):** Common defects in roving package, their causes and remedies, calculations pertaining to gearing, draft, t.p.i. and production, twist multiplier and roving twist.

**Total Lectures required =9**

**Grand total of lectures required = 42**

**Text Books and Reference material:**

1. A practical guide to combing and drawing- W. Klein
2. Spun Yarn technology- Eric Oxtoby
3. Spun Yarn technology, Vol-I- A. Venkatsubramani
4. Elements of Combing- Dr. A.R. Khare
5. Cotton Spinning- Taggart

Laboratory work: As per the lab Syllabus

### **3. Fabric Manufacturing-III (NTT-503) (L T P 3 1 0) Credits = 4**

**Unit (1):** Introduction to weaving process, general description of power looms, their mechanical details, settings and adjustments, primary, secondary and auxiliary motions.

**Total Lectures required =8**

**Unit (2):** Various ways of shedding, various types of sheds, tappet shedding, and idea of construction of tappet, under pick and over pick mechanism, beating up motion, early and late shedding, healds, reed & temples and their utility in loom.

**Total Lectures required =9**

**Unit (3):** Negative and positive take up motion, negative and positive let-off motions, merits and demerits of negative and positive take-up and let-off motion, causes of shuttle flying and shuttle trapping.

**Total Lectures required =9**

**Unit (4):** Warp protecting motion, side and centre weft fork motion, description of various types of dobby's, negative and positive dobby, preparation of chain/ lattice, scope and limitation of dobby, settings and adjustments.

**Total Lectures required =8**

**Unit (5):** Various timings and settings used on loom for filament weaving, Grey inspection and mending, folding process and machines, Numerical problems on loom speed, production & efficiency and cover factor.

**Total Lectures required =8**

**Grand total of lectures required = 42**

**Text Books and Reference material:**

1. Weaving Mechanism by Fox
2. Weaving Mechanism by N.N. Bennerjee
3. Weaving Calculation, by R. Sengupta
4. Weaving machine and mechanism by M.K. Talukdar

Laboratory work: As per the lab Syllabus

**4. Colour & Design (NTT-504) (L T P 3 1 0) Credits = 4**

**Unit (1):** Light and colour phenomena, physical basis of colour, Emission & absorption theory of light, Colour vision and light theory of colours, Complementary colours, Chromatic circle, Pigment theory of colours, Brewster circle, Attributes of the primary & secondary colours,

**Total Lectures required = 11**

**Unit (2):** Colour measurement, Primary, Secondary, Tertiary & compound colours, Biren's triangle, Modification of colours, Coloured greys, Colours in combination, Colour contrast, contrast in hue, contrast of tone, colour harmony, Relative spaces occupied by colours, divisional colours, Application of colours, Mixed colour effect,.

**Total Lectures required =11**

**Unit (3):** Composition of designs, Condition to be observed during ornamentation of fabrics, Mode shade, Harmony of succession, gradation of hue, Different stages of colouring of textile materials, Colour and weave effect and its classification. Bases of Textile design, One third and one fourth drop design, Half drop and drop reverse design,

**Total Lecture required = 10**

**Unit (4):** Unit repeating design, Geometric ornamentation, Construction of symmetrical designs, Stripe and check effect designs, Sari border / vertical border design, Factor affecting the woven designs, reversing inclined figure, Diamond, Ogee, & diagonal waved line base, applications of colours.

**Total Lecture required = 10**

**Unit (5):** Art sheet based question covering all above units

**Grand total Lectures required = 42**

**Reference Books:**

1. W. Watson- Textile design and colour
2. Traditional Textile designs B K Behera

**5. Fabric Structure (NTT-505) (L T P 2 1 0) Credits = 3**

**Unit (1):** Classification of various fabrics, construction of plain weave and its derivatives (rib and mat weave), ordinary twill, right hand twill, warp faced, weft faced & balanced twills,

**Total Lectures required = 8**

**Unit (2):** Satin regular, irregular and their extension. Combined twills, end to end and pick-to-pick combination, elongated twills, steep twills, broken twill, curved twill, Fancy twills-large diagonal shaded twills, Wave/ zig-zag, herringbone twill.

**Total Lectures Required = 8**

**Unit (3):** Regular and irregular satin, sateen base diagonals and brained twills, Diamond, mock leno, ordinary honeycomb, brighten honeycomb , Huck-a-back and crepe weave.

**Total Lectures Required = 9**

**Unit (4):** derivatives of hopsack, barley corn stitched hopsack and twilled hopsack, Ripstop weave, Simple and wadded bed ford cords (1), weft and piques (1), principle of figuring with extra material extra warp figuring, extra weft, limitation of extra thread.

**Total Lectures Required = 9**

**Grand Total Lectures Required = 34**

**Reference Book: -**

1. W. Watson Textile Design & colour Longmans Greens Co. London.
2. Z.J Grosicki Watson's Textile design and colour Newnes Buter Worth, London.
3. Z.J. Grosicki, Advance Textile Design Newnes Butter Worth, London.
4. "Nishant" A Grammar of textile.

Laboratory work: As per the lab Syllabus

**6. HS: Common Syllabus as decided by UPTU) (L T P 2 0) credits = 2**

## 5<sup>th</sup> SEMESTER LAB SYLLBUS

### **NTT-551, Textile Testing-I (L T P 0 0 3) Credit = 1**

Measurement of fibre length and its distribution, fineness, moisture content and strength etc using different methods and instruments, Fibre diameter and its variability, cleanliness of cotton, testing of neps in card web, sliver, roving and yarns, Analysis and interpretation of test results.

Measurement of hank of sliver, roving and count of yarn and their variability, Single yarn strength and elongation, Lea strength measurement, Use of statistical techniques for evaluation of experimental results

### **NTT-552, Yarn Manufacturing-III(L T P 0 0 3) Credit = 1**

Practice in handling operation, setting and gauging of lap former, comber and speed-frame, Study of constructional details of machines: various controls and change places etc., Practice in checking the quality of sliver, roving, comber lap and waste analysis, common fault and remedies, Calculation pertaining to speeds, constant, draft and production etc.

### **NTT-553, Fabric Manufacturing-III (L T P 0 0 2) Credit = 1**

Introduction to loom, its different parts and passage of material on it, Names of parts, setting and fitting of tappet shedding, dobby shedding, jacquard shedding, over pick, under pick, beat up, five wheel take up, seven wheel take up, negative let-off and semi-positive let-off motions

### **NTT-555: Fabric Analysis: (L T P 0 0 2) Credit = 1**

Analysis of various types of fabric structures like plain, twill, satin, hopsack, barleycorn etc , measurement of cover factor and crimp of fabrics.

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## 6<sup>th</sup> Semester B. Tech. Textile Technology

### 1. Textile Testing-II (NTT-601) (L T P 3 1 0) Credits = 4

**Unit (1):** Tensile properties of yarn and fabric, stress-strain curve, various methods for finding of yield point, methods for finding of various modulus, destination of tenacity, and stiffness of fabric.

**Total Lectures Required = 7**

**Unit (2):** Procedure of determination of strength and elongation in the spun yarns, knowledge about the equipment used, yarn tensile strength testing machines, single yarn strength tester, lea strength tester, fabric strength tester- impact tester, Grab test, fabric B.S. Test, Scott serigraph, Instron tensile tester. . **Total Lectures Required = 9**

**Unit (3):** Measurement of evenness testing of yarns, nature and causes of irregularities, principles and methods of evenness testing, evaluation and interpretation of evenness diagram & spectrogram and their associated equipment, Classimat faults .

**Total Lectures required =9**

**Unit (4):** Measurement of physical properties of fabric and the knowledge of the equipment used, tensile strength, bursting strength, tearing strength, pilling, air permeability, crimp, thickness, EPI, PPI, weight and cover factor.

**Total Lectures required =10**

**Unit (5):** Measurement of water repellency, shrinkage, measurement of fastness to light and rubbing, thermal transmission, Brief introduction to FAST and KAWABATA.

**Total Lectures required =7**

**Grand total of lectures required = 42**

#### Reference Books: -

1. Physical testing of textiles by B.P. Saville.
2. Quality control and testing management by Dr. V.K. Kothari.
3. Principles of textile testing by J.E. Booth.
4. Quality control by V.K. Kothari.

Laboratory work: As per the lab Syllabus