

**Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
Syllabus for B. Tech in Textile Technology (TT)
(Applicable from the academic session 2018-2019)**

Yarn Formation II (PC TT 501)

Name of the Course:		Yarn Formation II	
Course Code: PC TT 501		Semester: V	
Duration: 6 months		Maximum Marks: 70	
Teaching Scheme		Examination Scheme	
Theory: 3 hrs./week		Mid Semester Exam.:15 Marks	
Tutorial: Nil		Assignment & Quiz: 15(=10+5) Marks	
Practical: hrs./week		Attendance: 5 Marks	
Credit Points:3		End Semester Exam.: 70 Marks	
Objective:			
1	To understand the objectives and tasks of Comber, Speed frame and Ring frame.		
2	To explain in details the principles, mechanisms and technology involved in different preparatory and final processes (viz. Combing and its preparation, Roving preparation and Ring yarn spinning) to form carded/ combed yarns from drawing sliver along with respective machineries		
3	To understand the basics of modified ring frame processes such as compact spinning, Siro/Solo spinning etc.		
	To understand the necessity of Tow to top and Tow to Yarn conversion of filaments and principles of process and machines		
Pre-Requisite:			
1	Essential fibre properties for Spinning		
2	Predatory processes of Spinning such as Blowroom, Carding and Drawframe.		
3	PC TT 302 : Yarn Formation I		
End Semester Examinations Scheme. Maximum Marks – 70. Time allotted – 3 hrs.			
Groups	Units	Objective Questions (MCQ only with one	Subjective Questions

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		correct answer)					
		No. of questions to be set	Total marks	No. of questions to be set	To answer`	Marks per question	Total marks
A	1 to 5	10	10				
B	1 to 5			6	3	5	15
C	1 to 5			6	3	15	45

- **Only multiple choice type questions (MCQ) with one correct answer are to be set in the objective part.**
- **Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.**

Unit	Content	Hrs/Unit	Marks/Unit
1	Objectives and significance of combing. Tasks of a comber machine. Preparation of fibre assembly for combing from slivers to comber lap. Noils in comber. Sequence of combing operations in a Combing cycle. Zone-wise description of components of Comber machine and their driving arrangement. Fibre-fractionation and its theory in combing. Noils theory in comber. Modern developments and Automation in comber. Calculation related to production, draft in comber and its preparatory machines. Quality aspects in combing.	12	27
2	Objectives and requirement of roving operation. Functions of Speed frame machine. Machine elements of speed frames. Flyer twisting; types and design aspects of flyers.	12	27

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	Drafting systems in speed frames. Differential gear drives in Speed frame. Package building in speed frames. Reversing of bobbin rail, shortening of the lift, gear train & accessories; monitoring devices. Novel features of a modern roving frame and automation possibilities; Calculations pertaining to speed, production, draft and twist, coils/inch etc. Quality aspects in speed frame.		
3	Aim and objectives of ring spinning. Machine elements of ring frames. Principles of drafting systems. Twisting and winding operation; Design aspects of Spindles, Rings and Travellers. Methods of driving ring frame, variable; Study of package building. Spinning geometry. Analysis of forces on yarn and traveller. End breaks during spinning. New developments and automation in ring frames. Quality aspects in ring spinning. Calculation related to production etc.	14	30
4	Modifications in Ring spinning machines. Principles of, Compact, Siro, and Solo Spinning.	5	11
5	Tow to Top and Tow to Yarn conversion,. Principles of Cutting and stretch breaking, its machineries as well as pros and cons.	2	5
	Total	45	100

Text and reference books:

1. 'The Technology of Short Staple Spinning' by W. Klein. *The Textile Institute Publication, Manual of Cotton Spinning, Short Staple Spinning Series (volume-1);*
2. A Practical Guide to Combing & Drawing by W. Klein, *The Textile Institute Publication, Manual of Cotton Spinning, Short Staple Spinning Series (volume-3);*

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3. A Practical Guide to Ring Spinning by W. Klein, *The Textile Institute Publication, Manual of Cotton Spinning, Short Staple Spinning Series (volume-4)s*;
4. 'Spun Yarn Technology' by Eric Oxtoby, Butterworth, London, 1987;
5. 'Fundamentals of spun yarn technology' - Edited by Carl A. Lawrence, CRC Press, 200;
6. 'Advances in yarn spinning technology' by Carl A. Lawrence, The Textile Institute & Woodhead Publishing Series in Textiles (99), 2010;
7. 7 'Spun Yarn Technology' (Vol-3& Vol-4) by A Venkatasubramani;
8. Essential Calculations of Practical Cotton Spinning' by T.K Pattabhiraman
9. 'Spinning of Man-made Fibres and Blends on Cotton System' by K. R. Salhotra

Course Outcome:

After successful completion of this course, the students should be able to

1. Understand the objectives, tasks and basic principles behind each technological processes viz. Combing and its preparation, Roving and Ring spinning.
2. Understand the role of different components zone-wise in comber and its preparatory machines, Speed frame and Ring frame.
3. Illustrate the theory of material preparation of comber, speed frame and ring frame machine for carded and combed yarn manufacturing
4. Familiarize with basic know-how of compact and Siro/Solo spinning and tow-to-top/tow-to-yarn conversion.
5. Calculate the production of Comber, Speed frame and Ring frame.
6. Analyze the requirements of various level of noil % of combers and twist amount in roving and yarns as well as the causes of difference in draft amount in comber, speed frame and ring frame and their building mechanism.

Special Remarks (If any):

Demonstration of machines may be needed.

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Yarn Formation Lab II (PC TT 591)

Name of the Course:		Yarn Formation Lab II
Course Code: PC TT-591		Semester: V
Duration: 6 months		Maximum Marks: 100
Teaching Scheme		Examination Scheme
Theory: Nil		Continuous Internal Assessment:
Tutorial: Nil		External Assessment: 60
Practical: 3 hrs./week		Distribution of marks: 40
Credit Points: 1.5		
Course Outcomes: After successful completion of this course, the students should be able to		
1	Identify the machine components, forms of the materials, processes involved within each technological processes viz. Combing and its preparation, Roving Frame and Ring Frame.	
2	Illustrate material flow inside machines like comber, Lap former, Speed frame and Ring frame.	
3	Apply the know-how of theory of machines to study driving arrangement in all the processes such as Comber, Speed frame and Ring frame for carded and combed yarn manufacturing.	
4	Determine speed of components, draft, twist (wherever applicable) and production in Comber, Speed frame and Ring frame processes.	
5	Familiarize with working of building of roving and yarns and related parameters such as coils per inch etc.	
6.	establish the relationship between process parameters of yarns such as twist-strength, draft-twist etc.	
Pre-Requisite:		
1	Knowledge of PC TT392: Yarn Formation Lab-I	
2	Knowledge of PC TT 501: Yarn Formation II	
3	Knowledge of basics of theory of machines related to mechanical drives.	
4.	Knowledge of Computer application.	
Practical: 16 numbers of experiments		
		1) Intellectual skills – 55% (average)

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	2) Motor skill – 45% (average)

Laboratory Experiments	
1	Study and sketch the working mechanism of a rectilinear comber machine zone wise (viz. Feeding, combing, detaching, post-combing, drafting and delivery, noil collection) with respect to flow of material, machine components along with their dimensions, features etc.
2	Prepare a gearing diagram of driving elements of a rectilinear comber machine to calculate the speed of the components and production of the machine.
3	Determination of Mechanical Draft and draft constant of a comber machine from necessary gearing arrangements.
4	Study the combing cycle with respect to index wheel of a comber machine.
5	Study and sketch the working mechanism of a speed frame machine zone wise (viz. creel, drafting, twisting and winding) with respect to flow of material, machine components and their dimensions, features etc.
6	Prepare a gearing diagram of driving elements of a speed frame machine to calculate the speed of the components viz. spindle rpm, bobbin rpm etc. and hence find out the production of the machine.
7	Calculations of individual draft, total draft and different draft constant values of a speed frame machine from necessary gearing arrangements.
8	Calculations of twist and twist constant of a speed frame machine.
9	Study the working of building mechanism of a speed frame machine.
10	Study and sketch the working mechanism of a Ring frame zone wise (viz. creel, drafting, twisting and winding) with respect to flow of material and machine components along with their dimensions, features etc.
11	Determination of break draft, total draft and their respective constants of a Ring frame

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	machine.
12	Calculation of Mechanical twist and twist constant of a Ring frame machine. Hence find out the production in spindle-hr of the machine.
13	Determination of Coils per inch and lay constant of a ring frame machine.
14	Study the driving arrangement of different elements and building mechanism of a ring frame machine.
15	Study the elements of different modifications of ring spinning viz. Compact, Solo/Siro etc. with a neat sketch(At least one of the system)) and prepare a material flow on these system.
16	Study the twist strength relationship on ring spun and compact/solo spun yarns by preparing samples with predetermine level of twist multiplier and its strength determination
The above list is not exhaustive. Additional laboratory work or experiments can be planned to consolidate the theoretical work and to emphasise the activities for doing rather than the knowing.	

Text and reference books:

1. Different Spinning Machinery Manuals and user's guide
2. Essential Calculations of Practical Cotton Spinning' by T.K Pattabhiraman

Special Remarks (If any):

At least 10 experiments should be conducted

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Fabric Manufacturing II (PC TT 502)

Name of the Course:		Fabric Manufacturing II					
Course Code: PC TT 502		Semester: V					
Duration: 6 months		Maximum Marks:					
Teaching Scheme		Examination Scheme					
Theory: 3 hrs./week		Mid Semester Exam.:15 Marks					
Tutorial: Nil		Assignment & Quiz: 15(=10+5) Marks					
Practical: hrs./week		Attendance: 5 Marks					
Credit Points: 3		End Semester Exam.: 70 Marks					
Objective:							
1	To introduce the basic knowledge of fabric manufacturing process						
2	To impart knowledge of primary, secondary and auxiliary motions of various loom						
3	To impart knowledge of design of woven fabric						
4.	To synchronise various motions and laws of physic applied in weaving machine						
Pre-Requisite:							
1	Fabric Manufacturing1 PC TT 401						
2	Theory textile Machine ES TT 301, Mechanics of Textile Machines PE TT 401B						
3	Yarn Formation 1 PC TT 302 & Yarn Formation II PC TT-501						
End Semester Examinations Scheme. Maximum Marks – 70. Time allotted – 3 hrs.							
Groups	Units	Objective Questions (MCQ only with one correct answer)		Subjective Questions			
		No. of questions to be set	Total marks	No. of questions to be set	To answer`	Marks per question	Total marks
A	1 to 6	10	10				

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B				6	3	5	15
C				6	3	15	45
<ul style="list-style-type: none"> • Only multiple choice type questions (MCQ) with one correct answer are to be set in the objective part. • Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper. 							

Unit	Content	Hrs/Unit	Marks/Unit
1	<p>Primary motions : Shedding</p> <p>Introduction of shedding mechanisms, distinct and indistinct shed, tappet, cam or tappet shedding, shedding with negative cams, purpose of using tappet shaft, movement ratio of tappet shaft. Reversing mechanisms of heald.</p> <p>Expression of lift of the tappets and calculation of strain in the warp from shed height. Shed geometry, depth of the shed.</p> <p>Designing of linear and SHM cam for shedding for Plain, Twill, Satin, Sateen and The gear ratio of crank shaft, bottom shaft and auxiliary shaft as per design</p> <p>Positive shedding using grooved and matched cams, limitations of tappet shedding, heald staggering</p> <p>Heald, read and dent calculation in loom.</p> <p>Bending factor. Loom timings for shedding and its effect</p>	12	27

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	<p>on bending factor/inference factor</p> <p>Dobby and jacquard shedding, rotary doobby, single lift single cylinder jacquard, double lift single cylinder jacquard, double lift double cylinder jacquard, Verdol jacquard and types of shed.</p>		
2	<p>Primary motions : picking</p> <p>Introduction, different picking methods, shuttle picking, shuttle timing. Motion of shuttle during acceleration, catapult effect, nominal and actual displacement.</p> <p>Loom timing, relation between shuttle velocity and loom speed, loom width and rate of weft insertion for, conventional picking mechanisms, expression for power required for picking, shuttle checking</p> <p>Classification, cone over pick, cone under pick, advantages and limitations. Parallel pick and link pick,</p>	8	18
3	<p>Primary motions : beatup</p> <p>Movement of sley, beat up, sley eccentricity and the factors influencing it.</p> <p>Expressions related to sley displacement, velocity and acceleration.</p> <p>Effects of sley eccentricity on beat up force and timing available for shuttle flight.</p>	8	18

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	<p>Effect of sley eccentricity on loom dynamics.</p> <p>Beat up force, weaving resistance, bumping conditions.</p> <p>Speed and production calculations in power loom.</p>		
4	<p>Secondary motions</p> <p>Take up motions, objectives, negative and positive take up systems, five wheel, seven wheel and Shirley take up motions, design principles of take up systems for avoiding dangerous periodicities.</p> <p>Let off motions, negative and positive let off motions, tension variations.</p>	5	11
5	<p>Auxiliary motions & automatic looms</p> <p>Weft stop motions, side fork and center fork motions, warp protector motions, loose reed and fast reed.</p> <p>warp stop motions</p> <p>Automatic looms, weft feelers, bobbin change systems, weft mixing, drop box motions.</p> <p>Features of modern shuttle loom and control of fabric defects</p>	5	11
6.	<p>Introduction to Shuttleless loom</p> <p>Limitation of shuttle looms-parameters affecting productivity. Classification of shuttleless looms-</p>	7	15

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	Comparison of shuttle and shuttleless looms - warp and weft yarn requirement for shuttleless weaving. Weft accumulators – types- Formation of unconventional selvages – tuck-in, leno, chain, fused and adhesive. Techno economics of shuttleless weaving.		
		45	100

Text and reference books:

1. Textile Mathematics by J. E. Booth (Volume III).
2. Lord P.R. and Mohammed M.H., “Weaving – Conversion of Yarn to Fabric”, Merrow Publication, 2001.
3. Adanur S., “Handbook of Weaving”, Woodhead Publishing Limited, 2001
4. Weaving: Conversion of Yarn to Fabric by Lord and Mohamed.
5. Principle of weaving by R. Marks, A. T. C. Robinson , Textile Institute
6. Prabir Kumar Banerjee., “Principles of Fabric Formation”, CRC Press, 2014

Course Outcome:

After successful completion of this course, the students should be able to

1. Describe the functioning of weaving machine and its important motions
2. Select and control the process variables at loom
3. Calculate the picking force, shuttle velocity and acceleration in weaving machines and to use the equations of motions in textile applications
4. Calculate the speed and production rate of weaving machine
5. Apply the knowledge to develop various designs of woven fabric

Special Remarks (If any): NIL

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Fabric Manufacturing Lab II (PC TT 592)

Name of the Course		Fabric Manufacturing Lab II	
Course Code: PC TT 592		Semester: V	
Duration: 6 months		Maximum Marks:	
Teaching Scheme		Examination Scheme	
Theory: hrs./week		Continuous Internal Assessment:	
Tutorial: Nil		External Assessment: 60	
Practical: 3 hrs./week		Distribution of marks: 40	
Credit Points: 1.5			
Course Outcomes: After successful completion of this course, the students should be able to			
1	Carryout the hands-on-training of various mechanisms involved in woven fabric manufacturing		
2	Assemble the dismantled parts of weaving machine involved in various mechanism		
3	Specify the importance of each part in weaving machines		
4	Create miniature model of various parts of weaving machine.		
5	Apply the knowledge of PC TT 502		
Pre-Requisite:			
1	Theory textile Machine ES TT 301, Mechanics of Textile Machines PE TT 401B		
2	Fabric Manufacturing II PC TT 502		
Practical: 19 numbers of experiments			
		3) Intellectual skills-55%	
		4) Motor skill-45%	

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Laboratory Experiment:	
1	Study of path of warp yarn through various loom to understand the function of each component of loom.
2	Study of motion translation to various parts of a loom and study of train ratio.
3	Study of primary and secondary motions of loom with timing diagram.
4	Study the movement of the heald shafts with respect to crank shaft to establish the theory of simple harmonic motion for said shaft
5	Determine the lift of front and back heald in a cone over pick shuttle loom
6	Study of positive and negative shedding mechanism at the looms presented with schematic diagram and video-graph
7	Study of negative dobby and state the functions of different parts of negative dobby with suitable diagram
8	Study of Pegging plan of woven design for LHS and RHS dobby
9	Study of jacquard and state the functions of different parts of negative dobby with suitable diagram
10	Study the different types of shuttle with their parts
11	Study of various picking mechanism with schematic diagrams explaining the functions of parts of the loom involved in such picking
12	Study of sley movement behaviour with respect of crank rotation and validation of the theory of deviated SHM.
13	Determine the displacement of the sword pin rotation of the crank shaft of the cone over pick loom.
14	Study of the take up motion (5 wheel and 7 wheel) and determination of the practical dividend of cotton fabric in the cone over pick loom.
15	Study the positive and negative let-off motion various loom with suitable diagram
16	Study of pick at will box motion mechanism and box motion cycle of the loom with suitable diagram.

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17	Study the loose reed and fast reed warp protective motion of cone over pick loom with video-graph
18	Study of side weft and centre fork motion with video-graph
19	Study path of yarn in shuttleless loom
The above list is not exhaustive. Additional laboratory work or experiments can be planned to consolidate the theoretical work and to emphasise the activities for doing rather than the knowing.	

Text and reference books:

1. Different Weaving Machinery Manuals and user's guide

Special Remarks (If any):

At least 10 experiments should be conducted

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Textile Chemical Processing II (PC TT 503)

Name of the Course:		Textile Chemical Processing II					
Course Code: PC TT 503;		Semester: V					
Duration: 6 months		Maximum Marks:					
Teaching Scheme		Examination Scheme					
Theory: 3 hrs./week		Mid Semester Exam.:15 Marks					
Tutorial: Nil		Assignment & Quiz: 15(=10+5) Marks					
Practical: hrs./week		Attendance: 5 Marks					
Credit Points: 3		End Semester Exam.: 70 Marks					
Objective:							
1	To introduce the basic knowledge of dyeing of fibre/yarn/fabric						
2	To impart knowledge of process flow line of dyeing						
3	To impart knowledge of natural dye						
4	To impart knowledge of various dyeing machine						
5	To impart knowledge of quality assessment of coloured textiles						
Pre-Requisite:							
1	PC TT 301: Textile Fibre						
2	PC TT 402: Textile Chemical Processing I PC TT 492 : Textile Chemical Processing Lab I						
3	PC TT 402: Fabric Manufacturing I, PC TT 502 :Fabric Manufacturing II						
End Semester Examinations Scheme. Maximum Marks – 70. Time allotted – 3 hrs.							
Groups	Units	Objective Questions (MCQ only with one correct answer)		Subjective Questions			
		No. of	Total	No. of	To	Marks	Total

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		questions to be set	marks	questions to be set	answer` per	per question	marks
A	1 to 5	10	10				
B	1 to 5			6	3	5	15
C	1 to 5			6	3	15	45
<ul style="list-style-type: none"> • Only multiple choice type questions (MCQ) with one correct answer are to be set in the objective part. • Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper. 							

Unit	Content	Hrs/ Unit	Marks/U nit
1	<p>Basic Principles and system of Dyeing</p> <p>Concept of textile colour and objective of colouration. Classification of dyes, How dyes differs from pigment? Basic Principles and steps for dyeing. Character of different types of dyes for application on various fibres and concept of respective dye fibre bonds and dyeing mechanism. Dyeing of different form of textiles – fibre, yarn and fabric. Merits and demerits of each process. Introduction to different dyeing systems. Exhaust, semi continuous and continuous dyeing range for cellulosic textiles and comparative details between these processes with respect to productivity, cost and global need.</p>	12	27
2	<p>Details of different dyeing methods and process flow chart</p> <p>Exhaust dyeing of cellulosic textiles with direct dye, reactive dye, vat dye and sulphur dye. Application of naphthol colour on cotton.</p>	16	35

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	<p>Dyeing of protein fibres and nylon with acid dyes. Application of metal complex dyes.</p> <p>Dyeing of polyester fibres with disperse dye, Dyeing of acrylic fibre with basic dye.</p> <p>Dyeing process for cotton fabric by PAD-BATCH semi-continuous method with reactive dye. Dyeing process for cotton fabric by continuous method (PAD-DRY-PAD-STEAM) with vat dye system and with reactive dye system.</p> <p>Dyeing concept of blends : Dyeing of polyester-cotton blend in exhaust methods with Disperse dye. Concept of reduction clearing.</p> <p>Dyeing process for polyester-cotton blended/union fabric by continuous method with Disperse-vat dye combination as well as with Disperse-reactive dye combination. Concept of thermosol process.</p>		
3	<p>Dyeing machineries</p> <p>Introduction to Dyeing machineries used for fibre, yarn , fabric and Garment Dyeing.</p> <p>Working principles for Fibre dyeing machine; Yarn dyeing and Fabric dyeing machines : hank dyeing machine, jigger, winch and jet dyeing machines, semi-continuous and continuous dyeing range, etc,. Concept of space dyeing.</p>	9	20
4	<p>Introduction Natural Dye</p> <p>Different types of Natural dyes and natural dyeing process to colour different types of textile fibres. Concept of moranting.</p>	3	6
5	<p>Quality assessment of coloured textiles</p> <p>Properties of colour fastness of dyed textiles: colour fastness to</p>	5	12

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	washing; light; bleaching; rubbing; perspiration ;sea water, saliva, rubbing, hot pressing, bleaching, dry cleaning and sublimation.. Concept of colour matching – visual and computer aided spectrophotometer methods.		
		45	100

Text and reference books:

1. Shenai V.A ‘Technology of textile processing’ Vol II, III,IV, V, VI, VII&VIII Shevak.Publications 1981
2. Roy Choudhury A.K. “Textile Preparation and Dyeing” Science Publishers USA and Oxford & IBH, India.
3. Roy Choudhury A./K. “Modern Concept of Colour and Appearance” Science Publishers USA and Oxford & IBH, India.
4. Handbook of Fiber Science and Technology, Vol. I & II, Fundamentals and Preparation, Part A and B by M. Lewin and S.B. Sello,
5. Datya K.V.,Vaidya AA ‘Chemical processing of synthetic fibres and blends’ John Wiley&Sons,Newyork,1984

Course Outcome:

After successful completion of this course, the students should be able to

1. Discuss the principle and mechanism of dyeing of various fibre/ yarn/fabric
2. Prepare the dye recipe with synthetic and natural for colouring the various fibre/ fabric
3. Perform the dyeing of pretreated fabric
4. Examine the effect of chemical auxiliary on dyeing
5. Examine the colour fastness of the dyed fibre/ fabric
6. Apply the knowledge dyeing principle in relevant field.
7. Apply the knowledge of computer colour matching in relevant field.

Special Remarks (If any): NIL

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Textile Chemical Processing Lab II (PC TT 593)

Name of the Course:	Textile Chemical Processing Lab II
Course Code: PC TT 593	Semester: V
Duration: 6 months	Maximum Marks:
Teaching Scheme	Examination Scheme
Theory: hrs./week	Continuous Internal Assessment:
Tutorial: Nil	External Assessment: 60
Practical: 3 hrs./week	Distribution of marks: 40
Credit Points: 1.5	
Course Outcomes: After successful completion of this course, the students should be able to	
1	Prepare the dye recipe for colouring the various fibre/ fabric
2	Perform the dyeing of pretreated fabric
3	Examine the effect of chemical auxiliary on dyeing
4	Examine the colour fastness of the dyed fibre/ fabric
Pre-Requisite:	
1	PC TT 402: Textile Chemical Processing I,
2	PC TT 503: Textile Chemical Processing II
3	PC TT 492: Textile Chemical Lab I
Practical: 13 numbers of experiments	
	5) Intellectual skills- 50%
	6) Motor skill- 50%

Laboratory Experiment:

1	Dyeing of bleached cotton/jute using direct dye by standard laboratory method.
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2	Application of hot-brand reactive dyes on cotton yarn/fabric by exhaust method in open bath beaker dyeing machine
3	Dyeing of cotton yarn/fabric using cold brand reactive dyes by exhaust method
4	Dyeing of bleached cotton yarn/fabric using Vat dye by standard laboratory method
5	Dyeing of bleached silk / wool using Acid dye by standard laboratory method
6	Application of basic dye on acrylic fibre based yarn/fabric
7	Dyeing of bleached cotton fabric by cold-Pad-Batch method using reactive dyes
8	Application of Napthol colour on cotton yarn/fabric using standard laboratory method.
9	Dyeing of polyester fabric using Disperse dye by standard laboratory method (HT/HP)
10	Dyeing of polyester/cotton blended fabric
11	Application of vat/reactive dye on cotton fabric by PAD-DRY PAD-STEAM method.
12	Measurement of colour parameters and surface colour depth by computer aided reflectance spectrophotometer.
13	Evaluation of colour fastness to washing and rubbing for coloured textiles.
The above list is not exhaustive. Additional laboratory work or experiments can be planned to consolidate the theoretical work and to emphasise the activities for doing rather than the knowing.	

Text and reference books:

1. Shenai V.A 'Technology of textile processing' Vol II, III,IV, V, VI, VII&VIII Shevak.Publications 1981
2. Roy Choudhury A.K. "Textile Preparation and Dyeing" Science Publishers USA and Oxford & IBH, India.
3. Roy Choudhury A./K. "Modern Concept of Colour and Appearance" Science Publishers USA and Oxford & IBH, India.

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4. Handbook of Fiber Science and Technology, Vol. I & II, Fundamentals and Preparation, Part A and B by M. Lewin and S.B. Sello,
5. Datya K.V.,Vaidya AA 'Chemical processing of synthetic fibres and blends'' John Wiley&Sons,Newyork,1984

Special Remarks (If any):

At least 10 experiments should be conducted

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Textile Testing II (PC TT 504)

Name of the Course:		Textile Testing II					
Course Code: PC TT 504		Semester: V					
Duration: 6 months		Maximum Marks: 100					
Teaching Scheme		Examination Scheme					
Theory: 2 hrs./week		Mid Semester Exam.:15 Marks					
Tutorial: Nil		Assignment & Quiz: 15(=10+5) Marks					
Practical: hrs./week		Attendance: 5 Marks					
Credit Points: 2		End Semester Exam.: 70 Marks					
Objective:							
1	To learn principles of testing of essential physical parameters of textile fabrics						
2	To learn principles of testing methods of fabrics.						
3	To learn testing methods of dyed fabrics ,finished fabrics.						
4	To learn mechanical properties and methods to test mechanical properties of fabrics ,principles of different tensile testing instruments,different parameters of tensile strength from the testing parameters influencing tensile strength of fabrics						
Pre-Requisite:							
1.	PC TT 303,PC TT404						
2	General physics						
3	General chemistry						
4	Mathematics I and Mathematics II						
End Semester Examinations Scheme. Maximum Marks – 70. Time allotted – 3 hrs.							
Groups	Units	Objective Questions (MCQ only with one correct answer)		Subjective Questions			
		No. of	Total	No. of	To	Marks	Total

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		questions to be set	marks	questions to be set	answer`	per question	marks
A	1 to 4	10	10				
B	1 to 4			6	3	5	15
C	1 to 4			6	3	15	45

- **Only multiple choice type questions (MCQ) with one correct answer are to be set in the objective part.**
- **Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.**

Unit	Content	Hrs/Unit	Marks/Unit
1	Data Analysis & Review of statistical techniques Selection of samples for testing, random and biased samples, review of statistical techniques in textile testing	4	10
2.	Physical Testing of fabric Fabric parameters and dimensions: analysis of cloth- design, ends spacing, picks spacing, count of warp and weft, warp and weft crimp, fabric weight, fabric thickness; fabric strength: influence of fabric structure on strength, types of tests (raveled strip, grab, weakened strip etc.) types of testing (CRT, CRL, CRE and ARL),two dimensional tests(bursting strength etc.), tear strength; comfort properties: fabric handle and drape, bending, shear and compression properties of fabrics, stiffness, crease recovery and wrinkle behaviour; air, water and vapour transmission through fabrics, thermal	18	50

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	<p>resistance of fabrics, abrasion resistance of fabrics and durability: pilling resistance of fabrics, seam slippage, seam strength ,water repellency and shrinkage, Kawabata and FAST systems,special tests for carpets and nonwoven fabrics.</p> <p>Knitted fabric testing wales,course ,stitch density,gsm ,cover factor tightness factor,loop length, tex of yarn ,thickness of knitted ,bursting strength of knitted fabric</p> <p>Snags ,testing of snag</p>		
3.	<p>Testing of Dyed fabric</p> <p>Fabric wrinkling testing and evaluation Defect bow ,and skewing, Spirality of knitted fabrics; Flammability test: Inclined, Vertical plane, Limited oxygen Index test upholstery and bedding items; smoothness appearance;</p> <p>Eco testing of textiles testing ; testing of intelligent fabrics ;testing damaged textile samples.</p>	8	25
4.	<p>Fabric quality system</p> <p>Norms of global system for textile fabric and use, e.g. care labels, eco labels, Lab Accreditation, ISO .</p>	5	15
		35	100

Text and reference books:

1. Principles of Textile Testing by J. E. Booth
2. Textile Testing by Skinkle,
1. 3.Physical Properties of Textile Fibres by W.E. Morton and J.W.S. Hearle,
2. 4.Testing and Quality Management by V.K. Kothari

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6. Physical testing of textiles, B. P. Saville, Textile Institute , Woodhead Publishing, England,
7. Textile Testing: Physical, Chemical, and Microscopical , Skinkle, John H.

Course Outcome:

After successful completion of this course, the students should be able to

1. Use sampling techniques for testing textile materials.
2. Evaluate essential physical parameters of common textile fabrics
3. Explain the working principle of various testing instruments used in methods in relevant field
4. Interpret and analyse the tested values
5. Work on the various testing machine as covered.
6. Apply the basic principles intelligent fabrics

Special Remarks (If any): NIL

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Textile Testing Lab II (PC TT 594)

Name of the Course:	Textile Testing Lab II
Course Code: PC TT 594	Semester: V
Duration: 6 months	Maximum Marks: 100
Teaching Scheme	Examination Scheme
Theory: hrs./week	Continuous Internal Assessment:
Tutorial: Nil	External Assessment: 60
Practical: 3 hrs./week	Distribution of marks: 40
Credit Points:1.5	
Course Outcomes: After successful completion of this course, the students should be able to	
1	Explain the various fabrics properties
2	Identify constructional parameters of textile fabrics,
	Summarize the working Principle of all testing instruments of fabric.
3	Operate instruments used in testing of fabrics
4	Evaluate dyed fabrics
5	Reporting the experimental data
	Examine the material with testing results
	Analyse and interpret the results with various types of fabrics
Pre-Requisite:	
1	Elements of statistics
2	General physics for measurement
3	General chemistry about common solvents
4	TT of Textile fibres and Yarns
Practical: 13 number of experiments	
	7) Intellectual skills- 60 % (average)
	8) Motor skill- 40% (average)

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Laboratory Experiment:	
1	Determination of fabric end and picks density, count of yarn from fabric, areal density (GSM) , thickness, crimp of yarn and calculation of cover factors
2	Determination of course per inch, wales per inch, thickness, GSM, loop length, count of yarn from knitted fabric and tightness of the fabric
3	Determination of design of knitted fabric
4	Determination breaking load elongation of woven fabric and study of load elongation curve
5	Determination of bending length, crease recovery Drap coefficient of woven fabric.
6	Determination of tearing strength/tearing energy of fabric
7	Determination of bursting strength of a knitted/woven fabric
8	Determination of shrinkage of woven/knitted fabric.
9	Determination of abrasion resistance of woven fabric
10	Determination of pilling resistance of woven fabric
11	Determination of air permeability of fabric
12	Estimation of handle property of fabric by FAST method
13	Analysis of design of plain, simple twill and sateen and other regular woven fabric
The above list is not exhaustive. Additional laboratory work or experiments can be planned to consolidate the theoretical work and to emphasise the activities for doing rather than the knowing.	

Text and reference books:

1. 1.ASTM Standard testing books 2011
2. Textile testing by J.E.Booth

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3. 3.Fabrics Testing by Jinlian Hu
4. 4.Textile Laboratory Manual
5. Physical testing of textiles, by B. P. Saville,

Special Remarks (If any):

At least 10 experiments should be conducted

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Applied Statistics in Textiles (PE TT 501 A)

Name of the Course:		Applied Statistics in Textiles					
Course Code: PE TT 501 A		Semester: V					
Duration: 6 months		Maximum Marks: 70					
Teaching Scheme		Examination Scheme					
Theory: 2 hrs./week		Mid Semester Exam.:15 Marks					
Tutorial: Nil		Assignment & Quiz: 15(=10+5) Marks					
Practical: hrs./week		Attendance: 5 Marks					
Credit Points: 2		End Semester Exam.: 70 Marks					
Objective:							
1	The objective of the course is to impart the students a sound understanding of the statistical concepts and the basis of applying those concepts in a wide variety of problems in textile industry						
Pre-Requisite:							
1	10+2 basic knowledge of mathematics						
2	Basic Knowledge in Engineering Mathematics I Mathematics II and Mathematics III						
End Semester Examinations Scheme. Maximum Marks – 70. Time allotted – 3 hrs.							
Groups	Units	Objective Questions (MCQ only with one correct answer)		Subjective Questions			
		No. of questions to be set	Total marks	No. of questions to be set	To answer`	Marks per question	Total marks
A	1 to 10	10	10				10
B	1 to 10			5	3	5	15
C	1 to 10			5	3	15	45
<ul style="list-style-type: none"> Only multiple choice type questions (MCQ) with one correct answer are to be set in 							

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the objective part.

- Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.

Unit	Content	Hrs/Unit	Marks/ Unit
1	Introduction Need for statistics in textile manufacturing	1	2
2	Representation and Summarization of Data Frequency distribution and histogram, Probability density curves, Measures of central tendency, Measures of dispersions	3	8
3	Probability Set theoretic notation of events, Concept of probability, Conditional probability and Bayes' theorem, Random variables: discrete and continuous, Probability distribution, Expectation and variance, Moment generating function and characteristic function	6	15
4	Discrete Probability Distributions Bernoulli distribution, Binomial distribution, Poisson distribution, Hypergeometric distribution	3	10
5	Continuous Probability Distributions Gaussian distribution, Log-normal distribution, Chi-Square	4	12

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	distribution, Student's <i>t</i> -distribution, <i>F</i> -distribution		
6	Sampling Distribution and Estimation Sampling distribution, Point estimation, Interval estimation, 95% and 99% confidence intervals	4	10
7	Test of Significance Type-I and type-II Errors, Tests concerning means and difference between means, Tests concerning proportions, Tests concerning variances, Tests concerning expected and observed frequencies	4	12
8	Analysis of Variance One-way ANOVA, Two-way ANOVA	3	8
9	Regression and Correlation Basic concept of regression analysis, Correlation coefficient, Coefficient of determination, Spearman's rank correlation, Coefficient of concordance	3	8
10	Statistical Quality Control Acceptance sampling schemes for variables and attributes, OC curve, Producer's risk and customer's risk, Shewhart's control charts, Action and warning limits, \bar{X} , <i>R</i> , <i>p</i> , <i>np</i> and <i>c</i> charts, Average run length, CUSUM chart	5	15
		36	100

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Text and reference books:

1. Leaf, G. A. V., Practical Statistics for the Textile Industry-Part I & II, TheTextile Institute, UK, 1987.
2. Nagla, J. R., Statistics for Textile Engineers, CRC Press, USA, 2015.
3. Hayavadana, J., Statistics for Textile and Apparel Management, Woodhead Publishing India Pvt. Ltd., New Delhi, 2012.

Course Outcome:

After successful completion of this course, the students should be able to

1. Apply the concept of probability, central tendencies and dispersion in textiles
2. Apply discrete and continuous distributions in textiles
3. Apply the concept of choosing sample size and confidence limits for textile variables
4. Apply Z-test, t-test, F-test, Chi-Square test, ANOVA in textile manufacturing and Judge the hypothesis
5. Apply regression analysis and establish correlation between two textile variables
6. Apply acceptance sampling scheme and control charts in textile industry

Special Remarks (If any): NIL

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Statistical Quality Control in Textiles (PE TT 501 B)

Name of the Course:		Statistical Quality Control in Textiles					
Course Code: PE TT 501 B		Semester: V					
Duration: 6 months		Maximum Marks:					
Teaching Scheme		Examination Scheme					
Theory: 2 hrs./week		Mid Semester Exam.:15 Marks					
Tutorial: Nil		Assignment & Quiz: 15(=10+5) Marks					
Practical: hrs./week		Attendance: 5 Marks					
Credit Points: 2		End Semester Exam.: 70 Marks					
Objective:							
1	To introduce the concept of Statistical quality control in Textile						
2	To impart the knowledge of quality & quality control in textile						
3	To encourage for application of knowledge of statistical quality control in a wide variety of problems in textile industry						
Pre-Requisite:							
1	10+2 basic knowledge of mathematics						
2	Basic Knowledge in Engineering Mathematics I Mathematics II and Mathematics III						
3							
End Semester Examinations Scheme. Maximum Marks – 70. Time allotted – 3 hrs.							
Groups	Units	Objective Questions (MCQ only with one correct answer)		Subjective Questions			
		No. of questions to be set	Total marks	No. of questions to be set	To answer`	Marks per question	Total marks
A	1 to 8	10	10				

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B	1 to 8			6	3	5	15
C	1 to 8			6	3	15	45
<ul style="list-style-type: none"> • Only multiple choice type questions (MCQ) with one correct answer are to be set in the objective part. • Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper. 							

Unit	Content	Hrs/ Unit	Marks/Unit
1	Introduction to Quality & Quality Control Concept of quality, quality characteristics, quality standards, quality cost, concept of quality control, quality control methodology, statistical methods of quality control, quality philosophy and management strategies.	4	10
2	Statistical Description of Quality Population and sample, techniques of sampling, simple random sample, analysis of sample data, representation of sample data, practical examples.	5	15
3	Statistical Inferences on Quality Population and sample distributions, estimation of population parameters, statistical hypothetical test, practical examples.	5	15
4	Shewhart Control Charts Basis of control chart, types of control chart, design of control chart, analysis of control chart, control charts for variables and	5	15

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	attributes, case studies.		
5	Process Capability Concept of process capability, measures of process capability, potential process capability, actual process capability, process capability analysis, case studies	5	15
6	Other Control Charts Moving average control chart, cumulative sum control chart, exponentially weighted moving average control chart, case studies.	4	12
7	Acceptance Sampling Schemes Basis of sampling schemes, types of sampling schemes, acceptance sampling schemes for variables and attributes, operating characteristic curve, producer's risk, consumer's risk, rectifying inspection.	4	10
8	Six Sigma Concept of six sigma, methods of six sigma, DMAIC methodology, DFSS methodology, six sigma control chart, case studies.	3	8
		35	100

Text and reference books:

1. Leaf, G. A. V., Practical Statistics for the Textile Industry-Part I & II, The Textile Institute, UK, 1987.
2. Montgomery, D. C., Introduction to Statistical Quality Control, John Wiley & Sons, 2002.

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3. Dhillon, B. S., Applied Reliability and Quality: Fundamentals, methods, and Procedures, Springer, London, 2007.

Course Outcome:

After successful completion of this course, the students should be able to

1. Describe the concepts of quality and statistical application in textiles
2. Describe the quality and statistical inferences on quality
3. Analyse and accept the sampling schemes for variables and attributes
4. Apply concept of six sigma.
5. understand control charts for variables and attributes
6. Interpret and analyse the tested values

Special Remarks (If any): NIL

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Total Quality Management (OE TT 501 A)

Name of the Course:		Total Quality Management					
Course Code: OE TT 501 A		Semester:					
Duration: 6 months		Maximum Marks:					
Teaching Scheme		Examination Scheme					
Theory: 3 hrs./week		Mid Semester Exam.:15 Marks					
Tutorial: Nil		Assignment & Quiz: 15(=10+5) Marks					
		Attendance: 5 Marks					
Practical: hrs./week		End Semester Exam.: 70 Marks					
Credit Points: 3							
Objective:							
1	To understand the concept of Quality						
2	To understand the Implication of Quality on Business						
3	To Implement Quality Implementation Programs						
4	To have exposure to challenges in Quality Improvement Programs						
Pre-Requisite:							
1	Applied Statistics in Textile PE TT 501 A/ Statistical Quality Control in Textile PE TT 501B						
End Semester Examinations Scheme. Maximum Marks – 70. Time allotted – 3 hrs.							
Groups	Units	Objective Questions (MCQ only with one correct answer)		Subjective Questions			
		No. of questions to be set	Total marks	No. of questions to be set	To answer`	Marks per question	Total marks

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A	1 to 6	10	10				
B	1 to 6			6	3	5	15
C	1 to 6			6	3	15	45

- **Only multiple choice type questions (MCQ) with one correct answer are to be set in the objective part.**
- **Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper.**

Unit	Content	Hrs/Unit	Marks/Unit
1	Introduction Definition of Quality, Small q & Big Q, Quality characteristics- weaves, Dimensions, determinants, Quality Planning, Quality & profitability - idea, Analysis Techniques for Quality Costs, Basic concepts of Total Quality Management, Historical Review, Principles of TQM, Leadership – Concepts, Role of Senior Management, Quality Council, Quality Statements, Strategic Planning, Deming Philosophy, Barriers to TQM Implementation	8	16
2	Quality & Management Philosophies Customer satisfaction – Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement – Motivation, Empowerment, Teams, Recognition and Reward, Performance Appraisal, Benefits, Continuous Process	8	16

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	<p>Improvement: Deming Philosophy- Chain reaction, 14 points for management, triangle theory of variance, deadly diseases & sins, Demings wheel. Juran Philosophy- 10 steps for quality improvement, quality trilogy, universal breakthrough sequence. Crosby Philosophy- Crosby's 6 C's, Absolutes of quality, Crosby's 14 points for quality, Crosby triangle.</p> <p>Comparison of 3 major quality philosophies ,Supplier Partnership – Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures – Basic Concepts, Strategy, Performance Measure</p>		
3	<p>Managing Quality</p> <p>Traditional Vs Modern quality management, the quality planning, road map, the quality cycle. Cost of quality- Methods to reduce cost of quality, Sampling plans, O.C. curve</p>	6	15
4	<p>Quality Control</p> <p>Objectives of quality control, seven tools of quality, Strategy & policy. Company wise quality control.</p> <p>Quality Assurance- Definition, concepts & objectives. Economic models for quality assurance. Statistical methodology in quality assurance. Process capability ratio, Concept of six sigma, New seven Management tools.</p>	8	16
5	<p>TQM Tools</p>	10	25

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	Benchmarking – Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) – House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM) – Concept, Improvement Needs, FMEA – Stages of FMEA.		
6	Quality system Need for ISO 9000 and Other Quality Systems, ISO 9000:2000 Quality System – Elements, Implementation of Quality System, Documentation, Quality Auditing, TS 16949, ISO 14000 – Concept, Requirements and Benefits.	5	12
		45	100

Text and reference books:

1. Dale H.Besterfield, et al., “Total Quality Management”, Pearson Education, Inc. 2003. (Indian reprint 2004). ISBN 81-297-0260-6.
2. James R.Evans & William M.Lindsay, “The Management and Control of Quality”, (5th Edition), South-Western (Thomson Learning), 2002 (ISBN 0-324-06680-5).
2. Feigenbaum.A.V. “Total Quality Management”, McGraw-Hill, 1991.
3. Oakland.J.S. “Total Quality Management”, Butterworth Heinemann Ltd., Oxford, 1989.
4. Narayana V. and Sreenivasan, N.S. “Quality Management – Concepts and Tasks”, New Age International 1996.
5. Zeiri. “Total Quality Management for Engineers”, Wood Head Publishers, 1991.

Course Outcome:

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After successful completion of this course, the students should be able to

1. Understand the importance and significance of quality
2. Manage quality improvement teams
3. Identify requirements of quality improvement program

Special Remarks (If any): NIL

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Principle of Marketing and Management (OE TT 501B)

Name of the Course:		Principle of Marketing and Management					
Course Code: OE TT 501 B		Semester: V					
Duration: 6 months		Maximum Marks:					
Teaching Scheme		Examination Scheme					
Theory: 3hrs./week		Mid Semester Exam.:15 Marks					
Tutorial: Nil		Assignment & Quiz: 15(=10+5) Marks					
		Attendance: 5 Marks					
Practical: hrs./week		End Semester Exam.: 70 Marks					
Credit Points: 3							
Objective:							
1	To understand the concepts of marketing management						
2	To learn about marketing process for different types of products and services						
	To identify factors for product life cycle						
3	To understand the marketing environment						
4	To understand the consumer behaviour						
Pre-Requisite:							
1	English HM- HU 201, Language Laboratory HM-HU 291						
2	Technical Report Writing and Language Lab						
End Semester Examinations Scheme. Maximum Marks – 70. Time allotted – 3 hrs.							
Groups	Units	Objective Questions (MCQ only with one correct answer)		Subjective Questions			
		No. of questions to	Total marks	No. of questions	To answer`	Marks per	Total marks

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		be set		to be set		question	
A	1 to 7	10	10				
B	1 to7			6	3	5	15
C	1 to7			6	3	15	45
<ul style="list-style-type: none"> • Only multiple choice type questions (MCQ) with one correct answer are to be set in the objective part. • Specific instruction to the students to maintain the order in answering objective questions should be given on top of the question paper. 							

Unit	Content	Hrs/Unit	Marks/Unit
1	Introduction Definition & Core concept, marketing tools, P's- product, price, place and promotion	2	5
2	Market segmentation Definition of market segmentation and its use. The five steps involved in segmentation. The factors used to segment consumer and organizational markets The targeting and positioning & analyzing the marketing environment. The significance of heavy users in targeting markets. Development of market-product grid to use in segmenting and targeting a market.	4	10
3	Customer relationships and value through marketing Study consumer behavior, needs and motivation, group dynamics, social surroundings and consumer perception. Define marketing to explain the importance of discovering	12	30

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	<p>and satisfying consumer needs and wants. The difference between marketing mix elements and environmental factors</p> <p>The stages in the consumer decision process. The three variations of the consumer decision process: routine, limited, and extended. Psychological influences affect consumer behavior, particularly purchase decision processes. The major sociocultural influences on consumer behavior and their effects on purchase decisions. e. Recognition consumer behavior to better understand and influence individual and family purchases by the marketers.</p>		
4	<p>Management of products, services, and brands</p> <p>Brand evaluation and new trends in marketing. The product life-cycle concept and relate a marketing strategy to each stage. The different approaches to managing a product's life cycle. Elements of brand personality and brand equity and the criteria for the good brand name. Reason for different branding strategies employed by companies. The role of packaging and labeling in the marketing of a product in relation to textile ---CASE STUDY</p> <p>Analyze advertising, sales promotion, and public relations—CASE STUDY</p>	12	25
5	<p>Retailing and wholesaling</p> <p>Importance of retailing and wholesaling – types of retailing and wholesaling – recent trends in retailing and wholesaling with reference to textiles – retail and wholesale centres with reference to textiles in India and World ---CASE STUDY</p>	5	10

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6	<p>Ethics and marketing</p> <p>The significance of ethics in marketing. Difference between legal and ethical behavior in marketing. The factors that influence ethical and unethical marketing decisions. Different concepts of ethics and social responsibility. The meaning of ethics and social responsibility and how they relate to the individual, organizations, and society</p>	4	8
7	<p>Introduction to management</p> <p>Definition, nature, process, functions & skills. Evolution of management thoughts - F.W. Taylor, Henri Fayol, Max Weber, Elton Mayo.</p> <p>Management Approaches- System approach, contingency approach. Business Organisation - Types of ownership. Functional area of Management - Concept, objectives, scope and principle of Marketing Management, Production Management, HRM , Finance, Material management. Human resource management</p>	6	12
		45	100

Text and reference books:

1. 1.Evans. J. R. “Marketing: Marketing In The 21st Century”, 8th edition, 2003.
2. Philip Kotler, “Marketing Management”, PHI publications, 2004.
3. S.Shivaramu, “Export Marketing – A practical Guide to Exporters”, McGraw-Hill Book Company, 1985.
4. Ruth E.Glock and Grace L.Kunz, “Apparel manufacturing and sewn product analysis”, Prentice Hall, New Jersey, 2000.
5. D. Sinha, “Export Planning and Promotion”, IIM, Calcutta, 1981.

**Maulana Abul Kalam Azad University of Technology, West Bengal
(Formerly West Bengal University of Technology)
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(Applicable from the academic session 2018-2019)**

6. Tuhin K. Nandi, "Import–Export Finance", IIM, Calcutta, 1989.
7. J.A. Jarnow, M.Guerreiro, B.Judelle, "Inside the Fashion Business", MacMillan Publishing Company ISBN: 0-02-360000-4., 1987.
8. Ruth E.Glock, Grace I.Kunz, "Apparel Manufacturing: Sewn Product Analysis", Pearson Education, Fourth Edition, 2005.
9. Elaine Stone, Jean A. Samples, "Fashion Merchandising", McGrawHill Book Company, ISBN: 0–07–061742–2., 1985.
10. S.Shivaramu. "Export Marketing" – A Practical Guide to Exporters", Wheeler Publishing, ISBN: 81-7544-166-6, 1996.

Course Outcome:

After successful completion of this course, the students should be able to

1. Explain marketing concept in textile industry
2. Define the marketing segmentation
3. Scan the marketing environment.
4. Discuss ethics and social responsibility in marketing.
5. Define consumer behavior.
6. Recall the pricing methods and their application in relation to textile marketing

Special Remarks (If any): NIL