

Course Name : Diploma in Textile Manufacture
Course Code : DTM
Semester : Third
Subject Title : Mathematics III
Subject Code : 136TM31

Teaching and Examination Scheme:–

Teaching Scheme			Paper Hours	Examination Scheme												Total Marks
L	T	P		Theory		Test	Total		Practical		Oral		Termwork			
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min		
3	1	0	3	80	32	20	100	40	-	-	-	-	25	100	125	

Rationale:

The study of mathematics is necessary to develop the skills essential to solving engineering problems. Integral calculus is routinely needed by engineers in calculation.

Objectives:

- To make the student well versed in various methods of integration for solving problems.
- To impart knowledge of statistics.

Syllabus

Sr No	Topic	Contents	L	M
Section I				
1	Integration	1.1 Definition of integration. Integration of standard functions. 1.2 Theorems of integration. 1.3 Methods of Integration 1.3.1 Integration by substitution 1.3.2 Integration of rational functions. 1.3.3 Integration by partial fractions. 1.3.4 Integration by parts. 1.4 Definite Integration 1.4.1 Definition of definite integral. 1.4.2 Properties of definite integral with simple problems.	20	36
2	Applications	2.1 Applications of definite integrals 2.1.1 Introduction to standard curve. 2.1.2 Area under curve.	04	04

Section II				
3	Statistics	3.1 Mean, Standard Deviation, Variance, Coefficient of variation for raw and classified data 3.2 Probability 3.2.1 Sample space and events. 3.2.2 Concept of probability. 3.2.3 Conditional probability and independence. 3.2.4 Addition theorem, multiplication theorem.	15	25

4	Probability distributions	Probability distributions 3.1 Binomial distribution 3.2 Poisson's distribution 3.3 Normal distribution	09	15
		Total	48	80

REFERENCE BOOKS :

- 1) Applied Mathematics III - B. M. Patel, J. M. Rawal and others - Nirali Prakashan (July- 2010)
- 2) Mathematics for Polytechnic students - S. P. Deshpande - Pune Vidyarthi Griha Prakashan (first edition-Aug.2005)
- 3) Applied Mathematics II - G.V. Kumbhojkar - C. Jamnadas & Co. (second edition – 2010-11)
- 4) Fundamental of Mathematical statistics – S.C. Gupta, V.K. Kapoor- S.Chand & Sons (reprint-2007)

Course Name : Diploma in Textile Manufacture
Course Code : DTM
Semester : Third
Subject Title : Yarn Manufacturing I
Subject Code : 136TM32

Teaching and Examination Scheme:–

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Practical		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
4	-	3	3	80	32	20	100	40	-	-	25	10	25	100	150

Rationale:

The subject covers detailed study of important processing machines viz card, comber preparatory and combers. The subject includes the concepts involved and the modern developments. The processing of long staple fibres is also included.

Objectives:

- Learn in detail, the carding process.
- Learn in detail the machines required for the removal of short fibres through combing.

Syllabus

Part I:- Theory

Sr No	Topic	Contents	L	M
Section I				
1	Carding- Introduction and developments	1.1 Objectives and operating principles of a flat card. Detail study of the operating regions and their functions. 1.2 Study of the concepts of the heel and toe motion, the back plate and the percentage plate. 1.3 Developments in the various regions of the card like three liker-in, stationary flats, raising of the cylinder. 1.4 Modern doffing systems. Comparison of the above with the conventional card. Autolevelling on card.	12	20
2	Card clothing and maintenance of card	2.1 Flexible and Metallic wires, clothing arrangements and tooth geometry. Study of the concepts of fibre transfer in the cylinder-doffer region and formation of hooks. 2.2 Maintenance of card. Study of the tandem card and the card used in wool processing.	10	10
3	Calculations on card	3.1 Calculations related to speeds, draft and production of card. 3.2 Change places on card and calculations based on them.	10	10

Section II

4	Introduction to	4.1 Preparatory machines for combing. Objects of	12	20
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	Combing Preparatory and Comber	sliver-lap and ribbon-lap machines. 4.2 Detailed description of the driving arrangements and parts of the comber preparatory machines. 4.3 Principles and objects of Comber. Baer sorter and Noil%. Important settings affecting noil percentage in combing.		
5	Modern Combing Preparatory and Combers	5.1 Detailed description of the driving arrangements and parts of the comber. Combing cycle. Study of top-comb. Defects in comber sliver, their detection, causes and remedies. 5.2 Modern pre-combing machinery sequence, its advantages over the conventional system, settings and maintenance. 5.3 Modern high-speed comber, concept of short fibres in sliver and long fibres in waste. Fractionating efficiency of comber, optimum level of comber waste.	10	10
6	Calculations on comber and long staple processing	6.1 Calculations of speeds, drafts and production in combing preparatory. 6.2 Calculations of speeds, drafts and production in combing.	10	10
		Total	64	80

Part II: - Practicals

List of laboratory experiments

1. To study general construction of chute feed card, different parts on the card and passage of cotton.
2. To study the gearing diagram, calculation of speed of various parts, calculation of total draft & intermediary drafts, draft constants & production constants, change places in card and effect of changes made.
3. To study the feed mechanism & taker-in rollers, construction details of all operating parts, dismantling & resetting of the feed parts.
4. To study the constructional details of cylinder & doffer, various types of flexible bends, setting of flats, drive to flats & flat stripping comb.
5. To study doffer comb box mechanism, coiling & can driving mechanism.
6. To study Sliver lap machine.
7. To study Ribbon lap machine.
8. (A) General study of passage of cotton through comber.
(B) Calculations of speed, draft, production rate and comber noil %.
9. (A) Study of various important parts of comber and combing cycle and timing diagram.
(B) Important settings on comber.

Learning Resources:-

Text Book:

1. A practical guide to Blowroom and Carding-Volume 2, by Werner Klein, Published by- The Textile Institute, First Edition 1987.
2. A practical guide to Combing and Drawing-Volume 3, by Werner Klein, The Textile Institute, First Edition- 1987.

3. Elements of carding and drawframe, by Dr A R Khare, Published by Sai Book Centre, Mumbai, First Publication 1999.
4. Elements of Combing, by Dr A R Khare, Published by Sai Book Centre, Mumbai, First Publication 1999.
5. Manual of Cotton spinning, Drawframe, Comber, Speedframe, The Textile Institute, Vol IV- Part II by Frank Charnley.

References:

1. The technology of short-staple spinning-Volume 1, by Werner Klein, The Textile Institute, Published by The Textile Institute, First Edition-1987
2. Fundamentals of spun yarn technology, by Carl A Lawrence, CRC Press, woodhead Publishing Ltd, First edition 2003.
3. Handbook of yarn Production, by Peter R Lord, Published by CRC Press, Woodhead Publishing, First Edition 2003.
4. The Motivate series, Mcmillan texts for Industrial Vocational and Technical Education, Textiles by A Wynne
5. Manual of Cotton spinning, Carding, Vol III by W G Byerley, J T Buckley and others, Published by The Textile Institute.
6. Essential elements of practical cotton spinning, by T K Pattabhiram
7. Worsted-Pitman's Common Commodities and Industries, by Alan Brearly, Sir Issac Pitman and sons Ltd, London
8. Jute-Fibre to Yarn, Heywood, by R R Atkinson

Course Name : Diploma in Textile Manufacture
Course Code : DTM
Semester : Third
Subject Title : Fabric Manufacture-I
Subject Code : 136TM33

Teaching and Examination Scheme:–

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Practical		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
4	-	3	3	80	32	20	100	40	-	-	25	10	25	100	150

Rationale:

The subject is designed to give the basic information of fabric manufacturing methods and complete flowchart details of weaving processes. It also includes motions of looms and their details. Also this subject includes the sizing process, different sizing process and parameters affecting sizing process and defects due to sizing.

Objectives:

- Learn in detail the weaving preparatory process like sizing.
- Learning the basic operations on the loom for the production of fabric and its calculations.

Syllabus

Part I:- Theory

Sr No	Topic	Contents	L	M
Section I				
1	Sizing: Introduction	1.1 Objects of sizing, 1.2 size ingredients and their properties.	04	05
2	Sizing: Machines	2.1 Multi cylinder sizing machines. 2.2 Different Zones like Creel zone, saw box, drying zone, leasing zone and head-stock. 2.3 Construction of Saw box. Different types of Saw boxes. 2.4 Types of Sizing Creels. 2.5 Drying: Multi cylinder, Hot air and Infra red drying, Combination of hot air and infra red heating system.	10	12
3	Sizing: Size application	3.1 Size pick up 3.1.1 Importance of size pick up. 3.1.2 Factors affecting size pick up 3.1.3 Methods for measurement of size pick up 3.2 Drying. 3.3 Stretch% and its importance. 3.4 Concept of single end sizing and its application.	10	12

		3.5 Wet leasing, and their effect on sizing 3.6 Modern features of sizing machines		
4	Sizing: Drive	4.1 Drive to sizing machine, PIV gear and Differential gearbox, Crawling speed, Multi drives	04	04
5	Sizing: Calculations	Sizing calculations: Production, Efficiency, Pick up %, Stretch %.	02	04
6	Looming, Drawing-in and leasing	Introduction and importance to looming, drawing and leasing	02	03

Section II				
7	Introduction	7.1 Classification of Textile Industry 7.2 Classification of Fabrics 7.3 Classification of Looms	02	04
8	Primary motions	8.1 Introduction to weaving mechanism 8.2 Different parts of loom and their functions like Shuttle, Shuttle box, Picker, Buffer, Heald frame Reed, Race board, sley 8.3 Classification Loom Motion 8.3.1 Types of Primary Motion : Shedding, Picking, Beat up 8.4 Shedding Mechanism: 8.4.1 Passage of warp through the loom 8.4.2 Types of Shedding mechanisms 8.4.3 Construction, working, timing and setting of shedding mechanism 8.4.4 Early shedding and Late shedding 8.4.5 Positive shedding and Negative shedding 8.4.6 Types of sheds 8.5 Picking mechanism: Object of picking Mechanism, Functions of Picking Mechanism 8.5.1 Types of Picking Mechanisms: Cone over pick mechanism – its construction, working, timing and settings, Cone Underpick mechanism – its construction, working, timing and settings, Side lever underpick mechanism – its construction, working, timing and settings, Comparison between overpick and underpick mechanism 8.5.2 Factors affecting strength of the pick 8.6 Beat up Mechanism: Construction, working, timing and setting of beat up mechanism, Eccentricity of sley, Factors affecting eccentricity of the sley	12	14
9	Secondary Motions	9.1 Let-off Mechanism: Negative let off motion, its construction, working, timing and settings, Effect of beam diameter 9.2 Take up Mechanism: 9.2.1 Types of Take up motion: Five wheel take up	08	08

		<p>motion – its construction, working, setting and timing, Seven wheel Intermittent Take up motion – its construction, working, setting and timing, Positive continuous take up motions.</p> <p>9.2.2 Dividend and Take up calculations.</p>		
10	Auxillary motions	<p>10.1 Weft fork mechanism: Side weft fork mechanism, their construction, working and timing, settings, Centre weft fork mechanism, their construction, working and timing, settings, Comparison between side weft fork and centre weft fork motions</p> <p>10.2 Warp Protecting Mechanism: Loose reed mechanism 6vits construction, working, timing and setting, Fast reed mechanisms their principle, construction, working, timing and setting, Importance of swell mechanism and its working, Comparison between loose reed and fast reed warp protector motion</p> <p>10.3 Temples: Importance of Temples, Different types of temples Oscillating backrest</p> <p>10.4 Brakes: Objective of brakes, Construction, working of brake mechanism</p>	08	09
11	Calculations	Calculations related to loom speed, Production, Efficiency (Actual efficiency, Calculated efficiency), Average speed and average pick, count, Reed count, Heald count	02	05
		Total	64	80

Part II: - Practicals

List of laboratory experiments

1. To study Drive to sizing machine and general study.
2. To study Sow box, Drying cylinder, Steam trap, Measuring and marking motion.
3. To study and setting of shedding mechanism
4. To study and settings of cone over pick mechanism

5. To study and settings of cone underpick mechanisms
6. To study and settings of side lever underpick mechanisms
7. To study and setting of wheel and 7-wheel take-up mechanism
8. To study and settings of beat-up mechanism
9. To study let-off mechanism and brake motion
10. To study and settings of side weft fork mechanism
11. To study and settings of loose reed and fast reed motion.

Learning Resources:-

Text Books:

1. Principles of weaving by R. Marks, A. T. C. Robinson, The Textile Institute, Manchester, 1976
2. Winding, Warping by Dr. M K Talukdar
3. Plain Weaving Motions by K. T. Aswani, Mahajan Publishers, 1997.
4. Sizing Material, machine and process- M. K. Talukdar, D B Ajgaonkar, P.K. Sriramulu, Mahajan Publishers Pvt., Ltd., Ahmedabad. 2nd edition.
5. Weaving Machines, Mechanism, Management by M. K. Talukdar, P.K. Sriramulu, D.B Ajgaonkar, Mahajan Publishers Private Limited, Ahmedabad, edition 1998.
6. Weaving Calculations by Sen Gupta, Published by Tarapoverala Sons and Co. Pvt. Ltd., 2000

References:

1. Weaving : Conversion of yarn to fabric by P. R. Lord and M. H. Mohamed, Merrow publishing Co. Ltd., England, 2nd edition, 1988

Course Name : Diploma in Textile Manufacture
Course Code : DTM
Semester : Third
Subject Title : Cloth structure
Subject Code : 136TM34

Teaching and Examination Scheme:

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Practical		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	1	0	3	80	32	20	100	40	-	-	-	-	50	20	150

Rationale:

Study of fabric manufacture i.e. weaving is incomplete without the knowledge of fabric structure. This subject is aimed at educating student about more elaborate weaves like Plain, Twill, Satin, Honeycomb, Bedford Cord, Pique which are used in furnishing. Also this subject deals with concept of colour and weaves effect, which is very important in Textile Designing. During tutorial students do fabric analysis of various sample of above mention weaves, which help in better understanding of the subject.

Syllabus

Part I:- Theory

No	Topic	Contents	Hours	Marks
		Section I		
1	Basic weaves	1.1 classification 1.2 Methods of fabric representation 1.3 Notation of weave, draft and peg plan, 1.4 Different types of drafts and peg-plans. 1.5 Construction of plain, twill, Satin and sateen weaves. 1.6 Heald Calculation 1.7 Denting 1.8 Ornamentation of plain weave. 1.9 Commercial plain - woven fabrics, their constructions & characteristics. 1.10 Twist and twill interaction.	08	14
2	Derivatives of weaves	2.1 Derivatives of plain weave 2.1.1 Warp rib 2.1.2 Weft rib 2.1.3 Matt weave 2.1.4 Commercial fabric specifications for warp rib, weft rib and Matt weave and end use applications 2.2 Derivatives of twill weave 2.2.1 Regular twill 2.2.2 Waved twills 2.2.3 Herringbone twills 2.2.4 Curved Twills 2.2.5 Broken twills 2.2.6 Transposed twills 2.2.7 Elongated twills	10	18

		2.2.8 Combination twill weaves 2.2.9 Diaper weaves 2.2.10 Diamond weaves		
3	Satin and sateen weaves	3.1 Derivatives of satin and sateen weaves 3.2 Regular, Irregular satin weaves and satinette weaves 3.4 Comparison between satin and sateen weaves	06	08
		Section II	Hours	Marks
4	Other weaves	4.1 Honeycomb: 4.1.1 Ordinary honeycomb weave 4.1.2 Brighton honeycomb weave 4.2 Hack-a-back weaves 4.3 Mock leno weaves 4.4 Rib and cord structures like Bedford cord and Pique 4.5 Crepe weaves, their construction & characteristics and end uses	08	14
5	Terry pile structures	5.1 Formation of standard pile structures to produce pile weaves on 3 picks, 4 picks, 5 picks, 6 picks. 5.2 Special mechanism required for terry weaving. 5.3 Terry ornamentation - Strips and check pattern. 5.4 Figured terry fabrics. 5.5 Warp pile fabrics produced with the aid of wire. 5.6 All over and continuous pile structure. 5.7 Warp pile fabrics produced on the face to face principle, special mechanisms required for face to face weaving, continuous pile structure. Velvet structure – fast pile, Moquettees	10	16
6	Colour and Weave effect	Colour and weave effects for stripes, checks and simple figured designs.	06	10
		Total	48	80

Text Books:

1. Watson's Textile Design & Colour by Grosicki, Woodhead Textiles, (Seventh Edition), 1977.
2. Watson's Advanced Textile Design: Compound woven structures, by Z. Grosicki, Woodhead Textile Series No. 2, 1975.
3. Woven cloth construction by Robinson and Marks, The Textile Institute
4. Fabric Structure and Design by N. Gokarneshan, New Age International publisher, New Delhi, 2004
5. Textile Design and colour: Elementary and Figured Fabrics by William Watson, Longmans Green and co. London, edition second.

Reference Book:

1. Handbook of Textile Design – Jacquie Wilson, Woodhead Publishing Ltd. Edition 2001.
2. Textile Weaving and Design by W.S. Murphy, Abhishek Publications, Chandigarh, 2000.

Course Name : Diploma in Textile Manufacture
Course Code : DTM
Semester : Third
Subject Title : Textile Chemistry-I
Subject Code : 136TM35

Teaching and Examination Scheme:

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Practical		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	-	3	3	80	32	20	100	40	-	-	25	10	25	10	150

Rationale:

This subject deals with fibre study. It covers preparatory processing treatment for natural as well as synthetic fibres. Also this includes different machinery for processing of these textile materials

Objectives:

- Fibre Study in detail
- Fabric preparatory processes like desizing, scouring, bleaching and mercerizing.
- Fabric processing machinery.

Syllabus

Part I:- Theory

No	Topic	Contents	L	M
Section I				
1	Fibre study I (General)	Definition of Fibre and Polymers. Classification of fibres based on chemical composition Essential and desirable properties of a fibre.	03	6
2	Fibre study (Natural fibres)	Brief chemistry of textile fibre/polymers e.g. cellulose, proteins. Physical, chemical properties and applications of natural fibres	03	6
3	Fibre study (Man-made fibres)	Raw materials for manufacturing of man-made fibres like viscose rayon, polyester, nylon and acrylic Physical and chemical properties of man-made fibres and their applications.	03	6
4	Preparatory processing	Sequence of preparatory processing Importance, Shearing and cropping, Singeing, Desizing, Scouring, Bleaching. (Objective, Principle, Chemicals used, and process) Mercerization Objective, principles, processes and machines Concept RFD (Ready for dyeing)	15	22

Section II				
5	Machines used for preparatory process	Winches, Jiggers, Kiers, J-box, continuous pretreatment machines	09	15
6	Testing	Identification of fibres by microscopy, burning test	9	15

		and chemical methods. Testing of efficiency of preparatory processes. Efficiency of desizing, scouring, bleaching and mercerization		
7	Eco processing	Eco-friendly processing of textiles. Eco friendly aspect of desizing, scouring, bleaching. Combined process of pre-treatment	06	10
		Total	48	80

Part II: - Practicals

List of laboratory experiments:

- 1 Estimation of alkali mixture
- 2 Estimation of Sodium nitrite
- 3 Estimation of hypochlorites
- 4 Estimation of hydrogen peroxide
- 5 Desizing of cotton with acid, enzymes
- 6 Scouring of cotton
- 7 Bleaching of cotton with hypochlorite
- 8 Bleaching of cotton with hydrogen peroxide
- 9 Identification of fibres
- 10 Determination of each fibre content % in a blend fabric.

Learning Resources:

- 1 Technology of bleaching- By Dr. V.A.Shenai, Sevak Publications , Mumbai, 4th edition, 1984
- 2 Chemistry of fibres - By Dr. V.A.Shenai, Sevak Publications , Mumbai, 1st edition, 1971
- 3 Textbook of Fibre science and Technology by S.P.Mishra, New Age International Publications, New Delhi, 1st edition, 2000.

References:

- 1 Tablet on chemical processing- J. R. Modi, Published by Textile Association of India, 2005.
- 2 Introduction to Textile Fibres - Dr. H.V.S.Murthy, Published by Textile Association of India, 1987.
- 3 Chemical Processing of Cotton and Polyester-Cotton blends--Textile Association, Ahmedabad (Editor-Mody)

Course Name : Diploma in Textile Manufacture
Course Code : DTM
Semester : Third
Subject Title : Professional Practices
Subject Code : 136TM36

Teaching and Examination Scheme:

Teaching Scheme			Paper Hours	Examination Scheme										Total Marks
L	T	P		Theory		Test	Total		Pract.		Oral		Termwork	
			Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
-	-	2	-	-	-	-	-	-	-	-	-	25	10	25

Rationale:

Most of the diploma holders join industries. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests. While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts. The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation of students in learning process.

Objectives:

The Student will be able to:

1. Acquire information from different sources
2. Prepare notes for given topic
3. Present given topic in a seminar
4. Interact with peers to share thoughts
5. Prepare a report on industrial visit, expert lecture

Syllabus

Sr.No.	Contents	L
1.	Group Discussion : The students should discuss in a group of six to eight students and write a brief report on the same as a part of term work. Two topics for group discussions may be selected by the faculty members. Some of the suggested topics are – 3) Innovations in textile field ii) Career prospects in textiles iii) Discipline and House Keeping iv) Sports v) SWOT Analysis	10

2. Lectures by Professional / Industrial Expert be organized in areas of latest developments in the industry on the following topics: 12

- Spinning
- Weaving
- Textile Chemistry
- Textile Testing
- Garment Technology
- Technical Textiles

3. Industrial visit: 10

Industrial visit should be arranged to nearby industries & report of the same should be submitted by the individual students, to form a part of the term work.

Guided Library: Students should visit to the library and they should find out given topic/topics from the journals , Magazines, books etc.

Total

32