

**Course Name : Diploma in Textile Manufactures**  
**Course Code : DTM**  
**Semester : First**  
**Subject Title : Mathematics I**  
**Subject Code : 136MA11**

**Teaching scheme 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	2	-	3	80	32	20	100	40	-	-	-	-	25	10	125

**Rationale:**

Mathematics is the foundation stone for studies in all branches of Engineering. This subject helps students to develop logical thinking which in turn is useful in understanding the principles of all other subjects. Analytical and systematic approach towards any problem is developed by learning mathematics.

**Objectives:**

1. To teach students basic facts, concepts and principles of mathematics as a tool to analyze engineering problems.
2. To make students well versed in the prerequisites for further studies in mathematics and engineering.

**Syllabus  
Section I**

Sr No	Topic	Contents	Hours	Marks
1	<b>Binomial Theorem</b>	1.1 Concepts of Permutations and Combinations and problems based on ${}^n P_r$ , ${}^n C_r$ 1.2 Binomial Theorem with positive integral index, general term.	08	10
2	<b>Matrices</b>	2.1 Matrices of order m x n, types of matrices, equality of matrices. 2.2 Addition and subtraction of matrices, multiplication of matrices.	05	12
3	<b>Straight lines</b>	3.1 Equations of straight lines in different forms. 3.2 Angle between two straight lines, conditions for two parallel and perpendicular straight lines.	05	08
4	<b>Complex Numbers</b>	4.1 Definition of complex number, Elementary operations. 4.2 Argand's Diagram, Modulus, Amplitude, Polar form of a complex number.	05	10

## Section II

5	<b>Trigonometry</b>	5.1 Circular measure of an angle, Conversion from degrees to radians and radians to degrees. 5.2 Trigonometric ratios of angle in four quadrants. 5.3 Compound angle formulae. 5.4 Allied angle formulae. 5.5 Product formulae, Sum or difference formulae. 5.6 Multiple, submultiples angle formulae. 5.7 Inverse trigonometric functions. 5.8 Properties of triangle: sine rule, cosine rule. (without proof)	19	28
6	<b>Determinants</b>	6.1 Determinant of order three. 6.2 Cramer's rule. 6.3 Properties of determinants.	06	12
		<b>Total</b>	<b>48</b>	<b>80</b>

### Reference Books:

- 1) Basic Mathematics – B.M.Patel, J.M.Rawal and others - Nirali Prakashan
- 2) Mathematics for Polytechnic - S. P. Deshpande- Pune Vidyarthi Griha Prakashan

**Course Name : Diploma in Textile Manufactures**

**Course Code : DTM**

**Semester : First**

**Subject Title : Chemistry**

**Subject Code : 136CH12**

**Teaching scheme 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	-	2	3	80	32	20	100	40	50@	20	-	-	25	10	175

**Rationale:**

Chemistry is a basic science subject which is essential to all engineering courses. It gives knowledge of engineering materials, their properties, related applications & selection of materials for engineering applications. Current Chemistry syllabus is divided in two sections (I & II). Section I mainly deals with basic chemistry and section II with applied chemistry. It is intended to teach students the quality of water & its treatment as per the requirement, & selection of various construction materials & their protection by metallic & organic coatings. This subject will generate curiosity of carrying out further development in engineering fields. The topics covered will provide sufficient fundamental as well as background knowledge for the particular branch.

**Objectives:**

1. To understand mole concept and volumetric analysis.
2. To describe the mechanism of redox reactions.
3. Implementing the knowledge for the utilization of water resources in engineering & trouble shooting of the problems while using unsuitable water.
4. To identify the properties of organic compounds related to engineering applications.

### **Syllabus**

#### **Section I**

#### **Part I - Theory**

Sr No	Topic	Contents	Hours	Marks
1	<b>Atomic Structure and Chemical Bonding</b>	Definitions of Elements, atoms, Molecules, Fundamental particles of atom, their mass, charge, location, Definition of atomic number, atomic mass number, Isotopes and Isobars, Electronic configuration based on Hunds Rule, Aufbau's principle, Pauli's exclusion principle (till Atomic no. 30), Definitions: atomic weight, equivalent weights of an element, Molecular weight,	7	12

		Mole in terms of number, mass, volume, Definitions of equivalent weight and, Molecular weight of molecule, Determination of percentage composition of an element in a given molecule, Chemical bond, octet rule, formation of various types of chemical bonds: Covalent, Ionic, Coordinate covalent bonds along with examples CH <sub>4</sub> , H <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> , NaCl, MgCl <sub>2</sub> , H <sub>3</sub> O <sup>+</sup> , NH <sub>4</sub> <sup>+</sup> , BF <sub>3</sub> -NH <sub>3</sub>		
2	<b>Ionic Equilibrium</b>	Definitions & theories of acids & bases: Classical theory, Arrhenius theory, Lowry-Bronsted theory, Lewis theory, pH, pOH, pH scale, Basicity of an acid and acidity of a base, Numericals of Equivalent weight of acids, bases, Definition of salts & types of salts: Normal, Acidic, Basic, Mixed, Double salts, complex salts, Electrolytes, Types of Electrolytes, Degree of dissociation, ostwalds dilution law, Hydrolysis & Degree of hydrolysis, common ion effect, solubility product and Numericals	8	10
3	<b>Solution</b>	Solution, Concentrations of solution: Grams per litre, Percentage by weight or volume, Normality, Molarity, Molality. Volumetric analysis, Titrations, Acid base titration, Acidimetry, Alkalimetry, Redox titration, Iodometric titrations, Complexometric titration, Precipitation titration.	6	12
4	<b>Redox Reactions</b>	Introduction, Oxidation, Reduction, Electron transfer concept, Oxidising & reducing agents, Redox reactions in aqueous reactions, Oxidation number & rules for assigning oxidation number, Balancing of the chemical reaction	6	06

## Section II

5	<b>Water</b>	Introduction, Hard and soft water, hardness and its determination (EDTA method only). boiler problems- scale, sludge, priming and foaming, caustic embitterment and corrosion, their causes and prevention, Water softening processes – Lime – Soda process, Zeolite Permutit method, Ion exchange method and comparison of methods, Numerical problems on hardness by EDTA method.	08	10
6	<b>Lubricants</b>	Lubricant, Lubrication, Function of lubricant, Types of lubricants, Mechanisms of lubrication, Ideal lubricant and properties: Viscosity, Viscosity index, fire point, flash point, pour point, cloud point, Saponification value, Acid value.	06	06

7	<b>Corrosion</b>	Introduction, Types of corrosion (dry and wet corrosion), factors affecting the corrosion, types and mechanism of Atmospheric corrosion, oxide films, electrochemical corrosion, protective measures against corrosion: coatings (galvanic and zinc, organic coating agents, Electroplating, metal cladding).	07	08
8	<b>Polymers</b>	Polymer, Monomer, Polymerisation, Addition and condensation polymerisation, Plastics: definition, types: thermosetting & thermo softening plastics, compounding of plastics, properties and applications of plastics, Rubber, structure of rubber, Natural rubber: preparation & properties, Vulcanization of rubber, properties of vulcanized rubber, synthetic rubber & its comparison with natural rubber. Properties and applications of rubbers.	08	08
9	<b>Organic Chemistry</b>	Introduction: Types of chemistry, Catenation property of Carbon element, Organic compounds, its properties and applications, Classification: by structure and functional group, Homologous series, Alkanes, alkenes and alkyenes: Definition, General formula, Names and structure of first five members, Isomerism, Properties and Uses.	08	08
		<b>Total</b>	<b>64</b>	<b>80</b>

## Part II – Practicals

### List of experiments:

- To study the use of indicators, for identification of acid, base and neutral solutions from the given set of solutions.
- To standardize HCl solution using N/10 Na<sub>2</sub>CO<sub>3</sub>.
- To standardize KMnO<sub>4</sub> solution using N/10 C<sub>2</sub>H<sub>2</sub>O<sub>4</sub> solution.
- To standardize EDTA solution using N/10 ZnSO<sub>4</sub> solution.
- To estimate of hardness of water by EDTA complexometric titration.
- To estimate amount of chloride in tap water by Mohr's Method
- To determine acid value of given lubricating oil.
- To determine relative viscosity of given oil.
- To determine flash point value of given lubricating oil using Able's apparatus.
- To determine flash point value of given lubricating oil using Pensky Martin's apparatus.

### Learning Resources:

#### Text Books

- Essentials of Physical chemistry B. S. Bhal & G. D. Tuli, Edition: 18<sup>Th</sup> (2010) S Chand Group, New Delhi.
- Engineering Chemistry Jain & Jain Dhanpat Rai & Co. (Pvt.) Delhi – 110006 Ltd Edition: Fifteenth (2008)

**Reference books**

1. A Text Book of Chemistry, Shashi Chawla, Educational & Technical Publishers Dhanpat Rai & Co. (Pvt.) Ltd, Edition: Third (2005)

**Course Name : Diploma in Textile Manufactures**  
**Course Code : DTM**  
**Semester : First**  
**Subject Title : Communication Skills I**  
**Subject Code : 136HM13P**

**Teaching scheme 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	2	-	3	80	32	20	100	40	-	-	-	-	25	10	125

**Rationale:**

Technicians in industry require grammatically correct written and oral communication. In order to develop the abilities in students a text has been introduced. The tutorials have been incorporated to provide practice to the students to develop writing skills. Further exercises have been included for improving written and oral communication, apart from the basic grammar topics.

**Objectives:**

Developing the skills of comprehension of passages, building vocabulary and ability to express through oral and written communication, improving skills of composition, and helping them formulate grammatically correct sentences and express ideas effectively.

**LEARNING STRUCTURE**

**Application:**

To enable students to comprehend the meaning of new words, use grammar to write correct answer to the questions and develop paragraphs

**Procedure:**

1. Technique of providing responses to short and long questions
2. Technique of application of grammar
3. Procedure for writing paragraphs
4. Technique of referring to dictionary and thesaurus

**Principles:**

1. Principles of formation of sentences
2. Principles of identification of various aspects of grammar
3. Principles to develop the theme of paragraph

**Concepts:**

Concept of comprehending the text

Concept of Time

Concept of classifying types of paragraphs

**Facts:**

1. Content of the text
2. Part of speech: Tenses, Verbs etc.
3. Topic sentences

## Syllabus

### Part I – Theory

### Section I

Sr No	Topic	Contents	Hours	Marks
1		PART I: TEXT- Communication Skills-I compiled by Mrs. R. Thomas *Vocabulary-Understanding meaning of contextual words - Understanding the passage, discussing the theme and expressing it appropriately Answering short questions Descriptive answers to judge comprehension as well as the ability to express * Identifying parts of speech to improve day to day oral communication Paragraph Writing/ Short composition How to write a paragraph /short composition (Exercises given in assignment 4)	18      6	      15  15  10

### Section II

Sr No	Topic	Contents	Hours	Marks
2		PART II: Application of Grammar Verbs: Subject –verb- agreement Using appropriate Tenses according to the suitability and time elements( correction of tenses in paragraphs written by students ) Correction of commonly misspelled words Identifying Common errors in English language	10	15
3		PART III: Comprehension	04	10
4		PART IV: Vocabulary Building Use of synonyms/ antonyms/ homonyms /homophones/ One word substitute Idioms /phrasal verbs Technical vocabulary (usage of appropriate technical words in a passage )	10	15
		<b>Total</b>	<b>48</b>	<b>80</b>

Term work will consist of 16 assignments.

## **Skills to be developed :**

### **Intellectual Skills:**

1. Skills of Speaking correct English
2. Exploring details and its application.
3. Reporting Skills and expressing effectively

### **Motor Skills:**

Use of appropriate body language  
Diction and Enunciation

### **Listening Skills:**

Skills of listening and Comprehension

### **List of Assignments:**

#### **Building Vocabulary** – (14 hrs – 7 assignments)

20 words for each assignment of synonyms/ antonyms/ homonyms /homophones/ One word substitute 20 idioms /phrasal verbs

#### **Grammar** – ( 10 hrs – 5 assignments)

Subject –verb agreement, Tenses , Correction of tenses in the passages written by students.

Usage of appropriate spellings, Errors in English

Find out the errors and rewrite the sentences given by the teacher. (20 sentences)

#### 3. Write paragraphs/ short composition on given topics (4 hrs)

Engineers – Nation Builders

An unforgettable incident

Narrate your long term goal in life.

Biography of a person who inspired you.

#### 4. Passages for comprehension (4hrs)

### **Learning Resources:**

**Text Book:** Communication Skills I- Compiled by Mrs. Thomas, H&M Dept

### **Reference Books:**

1. Contemporary English grammar, structure and composition, Green David, Macmillan, India, First edition, 2000.
2. English grammar and composition, R. C. Jain, Macmillan, India, First edition, 2005.
3. Thesaurus, Rodgers, Oriental Longman
4. Dictionary, Oxford, Oxford University
5. Dictionary, Longman, Oriental Longman
6. English for Practical purposes, Patil Z. N. et al, Macmillan, India, 2004
7. English at Workplace, Sanyal Mukti, Macmillan, India

**Course Name : Diploma in Textile Manufactures**  
**Course Code : DTM**  
**Semester : First**  
**Subject Title : Introduction to Textiles**  
**Subject Code : 136TM14**

**Teaching scheme 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	125

**Rationale:**

The subject is introduced to familiarize the students to the basic textile processes. The subject introduces the naturally available raw material and their procurement. It introduces the various types of yarns produced and also familiarizes the students with the spinning, weaving and processing of textile fabrics. Calculation of speeds for various types of drives used in the working of the textile machinery.

**Objectives:**

Students must be able to,

1. Identify the natural fibres.
2. Classify the various naturally available textile fibres and know the units of measuring their Properties
3. Know the various types of yarns.
4. Learn the spinning, weaving and processing flowcharts
5. Know the various types of drives and calculate speeds.

**Syllabus**

**Part I – Theory**

**Section I**

Sr No	Topic	Contents	Hours	Marks
1	<b>Overview of the Textile Industry, raw material and their classification based on origin</b>	1.1 Textile industry, history, growth, scope, potential and recent trends. Fibres used in the textile industry.  1.2 Difference between Natural, Regenerated and synthetic fibres. Fibre classification on the basis of origin. Definition of terms like- Fibre, Staple fibre and filament. Mono and multifilament.	8	14

2	<b>Introduction to natural fibres and their characteristics</b>	2.1 Basic fibre properties like fineness, length, strength, elongation, moisture regain, stiffness and fibre contamination. The essential and the desirable properties of fibres. Units used for the above measurements. 2.2 Cotton, wool, silk and jute as raw materials, their growth and their characteristics like Cross sectional shape and surface characteristics and their effects on fibre properties.	8	14
3	<b>Polymer and the important fibre properties.</b>	3.1 Definitions of Monomer and Polymer. Thermoplastic and Non thermoplastic polymers. Degree of polymerization, molecular weight, crystallinity, fibre orientation and their effects on fibre properties. 3.2 Properties of fibres like Cotton, Wool, Silk Jute, Viscose Rayon, Polyester, Polyolefins and Polyamides. Comparison of the values of important fibre properties.	8	12

### Section II

4	<b>Introduction to spinning</b>	4.1 Definition of Yarn, spun yarn, filament yarn, plies yarn. Classification of yarn. Cotton Spun Yarn spinning –flow chart and object of each process. 4.2 Basic introduction to the various types of yarns like ring spun, open end, fancy, textured and blended yarns.	8	14
5	<b>Introduction to weaving and fabric processing</b>	5.1 Definitions-, classification of fabrics. Fabric, warp and weft, selvedge. Flow chart and object of each process for woven fabric production. Types of knitted and non woven fabrics. 5.2 General flow chart for processing of grey fabric	8	14
6	<b>Calculation related to the various types of drives.</b>	6.1 Various types of drives like pulley drive, gear drive, belt drives, cone drums, rack and pinion, worm and worm wheel. Types of cams. 6.2 Speed calculations, rpm and surface speeds. Problems based on these calculations.	8	12
		<b>Total</b>	<b>48</b>	<b>80</b>

### Part II: - Practicals:

#### List of laboratory experiments:

- 1 Observation of the various blowroom machines. Name them and briefly state their objects.
- 2 Observation of the sequence of spinning and the drawing of the flowchart.
- 3 Speed calculations for the various drives used in the spinning machines.

- 4 Demonstration of the working of the loom.
- 5 Observation and drawing of the flowchart of weaving
- 6 Speed calculation for the various basic drives used in the weaving machines

**Learning Resources:**

**Text Book:**

1. The Technology of Short staple spinning, Vol 1 by Werner Klein, Published by The Textile Institute, First Edition-1987

**References:**

1. The Technology of Short staple spinning, Vol 1 by Werner Klein, Published by The Textile Institute, First Edition-1987
2. Manual of Cotton spinning, The Characteristics of Raw Cotton, The Textile Institute, Volume I by Coulson.
3. Manual of Cotton spinning, The Characteristics of Raw Cotton, The Textile Institute, Volume II Part I by E Lord.

**Course Name** : Diploma in Textile Manufactures  
**Course Code** : DTM  
**Semester** : First  
**Subject Title** : Basic workshop practice  
**Subject Code** : 136ME15

**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
1	-	3	-	-	-	-	-	-	-	-	-	50	20	50	

**Rationale:**

Diploma in Textile Manufactures student is expected to know basic workshop practice like Wood working and hot working processes. The students are required to identify, operate and control various machines. The students are required to select and use various tools and equipments related to Wood working and smithy processes.

**Objectives:**

The student will able to

- 1) Know basic workshop processes.
- 2) Read and interpret job drawing.
- 3) Identify, select and use various marking, measuring, holding, striking and cutting tools & equipments.
- 4) Operate, control different machines and equipments.
- 5) Inspect the job for specified dimensions.
- 6) Produce jobs as per specified dimensions.
- 7) Adopt safety practices while working on various machines.

**Syllabus**

Sr. No.	Topic	Contents	Hours
1	<b>ENGINEERING MATERIALS</b>  <b>LATHE Machine</b>	Introduction. Different types of ferrous and non-ferrous materials. Properties of Engineering materials.  Introduction. Various operations performed on Lathe machine. Main parts of Lathe machine	5
2	<b>CARPENTRY SHOP</b>	Introduction. Various types of woods. Different types of tools, machines and accessories.	2
3	<b>FITTING SHOP</b>	Introduction Various marking, measuring, cutting, holding and striking tools. Different fitting operation like chipping, filing, right angle marking, drilling, tapping etc. Working Principle of Drilling machine, Tapping dies, its use. Safety precautions and safety equipments.	3

4	<b>WELDING SHOP</b>	Introduction. Types of welding, ARC welding, Gas welding, Gas Cutting. Welding of dissimilar materials, Selection of welding rod material, Size of welding rod and work piece	3
5	<b>SMITHY SHOP</b>	Introduction. Different forging processes like shaping, caulking, fullering, setting down operations etc. Safety precautions and safety equipments.	3
		<b>Total</b>	<b>16</b>

<b>Sr.No.</b>	<b>Details Of Practical Contents</b>
1	<b>CARPENTRY SHOP:</b> Demonstration of different wood working tools / machines One simple job involving any one joint like mortise and tenon, dovetail, bridle, half lap etc.
2	<b>WELDING SHOP:</b> Demonstration of different welding tools / machines. One simple job involving butt and lap joint
3	<b>FITTING SHOP:</b> Demonstration of different fitting tools and drilling machines and power tools. One simple fitting job involving practice of chipping, filing, drilling, tapping, cutting etc.
4	<b>METAL TURNING:</b> Demonstration of Lathe machine. Demonstration of various parts of Lathe machine. Demonstration of various operations performed on Lathe. One simple job involving plain turning, step turning and chamfering

**Text Books:**

1. Mechanical Workshop Practice-K.C.John-PHI Learning Pvt Ltd. EEE 2010

**Reference Books:**

1. B.S. Raghuwanshi- Workshop Technology – Dhanpat Rai and sons, New Delhi, Ninth Edition 2002
2. S.K. Hajra Chaudhary- Workshop Technology Vol I & II – Media Promoters and Publisher, New Delhi. Eighth Edition 1986

**Course Name :** Diploma in Textile Manufactures  
**Course Code :** DTM  
**Semester :** First  
**Subject Title :** Engineering Graphics  
**Subject Code :** 136ME16

**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
1	-	3	-	-	-	-	-	50	20	-	-	50	20	100	

**Rationale:**

This subject aims at making the students understand the fundamentals of Engineering graphics which is a language used by Engineers for developing & expressing ideas & conveying the instructions which will be used to carry out jobs in the field of engineering. The subject deals with drawing instruments & its use, Sectional orthographic projections and isometric views. An introduction to computer drafting will be helpful in understanding the application of the subject in the industry. This subject will play very important role in designing, operation and maintenance areas of the existing and changing technological requirements of the modern world.

**Objectives:**

The student will able to

- 1) Understand the fundamentals of Engineering Graphics
- 2) Read and interpret object drawings.

**Syllabus**

Sr. No.	Topic	Contents	Hours
1	<b>Drawing Instruments &amp; their uses</b>	1.1 Letters & Numbers (Single stroke Vertical) 1.2 Convention of Lines & its applications	3
2	<b>Orthographic Projections</b>	2.1 Planes of projections – HP, VP, & PP Orthographic projections of points. 2.2 Sectional Orthographic Projections of simple Machine parts ( Full section in one view)	8
3	<b>Pictorial Views</b>	Isometric Projections and Isometric Views. (No problems with slots on inclined surfaces)	4
4	<b>Demonstration</b>	Demonstration of drafting software to the students.	1
		<b>Total</b>	<b>16</b>

**Practicals :**

The students should work out the problems on the following topics preferably on quarter imperial drawing sheets during the practical.

1. Eight Sheets on the topic of Orthographic Projections.
2. Two sheets on Isometric Projections.

**Text Books:-**

1. Engineering Drawing : N.D.Bhat , Charotar Publishers, 49<sup>th</sup> Edition 2010
2. Engineering Graphics & Engineering – S.T.Ghan, M.V.Rawalani- Nirali Publications-seventh Edition -2009

**References:-**

1. Engineering Drawing- D.A.Jolhe - TATA McGraw Hill- 2008
2. Engineering Graphics- K.R.Mohan – Dhanpatrai publishing co.-1<sup>st</sup> edition-2009