MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI
TEACHING AND EXAMINATION SCHEME

COURSE NAME : DIP IN TEXTILE TECHNOLOGY

COURSE CODE : TC

DURATION OF COURSE : 6 SEMESTERS   **WITH EFFECT FROM**

SEMESTER : SECOND   **DURATION : 16 WEEKS**

PATTERN : FULL TIME - SEMESTER   **SCHEME : G**

SR. NO.	SUBJECT TITLE	Abbreviation	SUB CODE	TEACHING SCHEME			EXAMINATION SCHEME										SW (17200)
				TH	TU	PR	PAPER HRS.	TH (1)		PR (4)		OR (8)		TW (9)		
								Max	Min	Max	Min	Max	Min	Max	Min	
1	Communication Skills $	CMS	17201	02	--	02	03	100	40	--	--	25#	10	25@	10	
2	Mathematics & Statistics Ø	MAS	17217	04	01	--	03	100	40	--	--	--	--	--	--	
3	Organic Chemistry - I	OCH	17221	03	--	02	03	100	40	50@	20	--	--	--	--	
4	Physical Chemistry	PCH	17222	03	--	02	03	100	40	50@	20	--	--	--	--	
5	Chemistry of Natural Fibers	CNF	17223	03	--	--	03	100	40	--	--	--	--	--	--	50
6	Computer Fundamentals $	CMF	17002	01	--	04	--	--	--	50#*	20	--	--	25@	10	
7	Development of Life Skills $	DLS	17010	01	--	02	--	--	--	--	--	25@	10	--	--	
8	Elements of Electrical Engineering & Mechanics	EEE	17015	--	--	02	--	--	--	--	--	--	--	50@	20	
	TOTAL			17	01	14	--	500	--	150	--	50	--	100	--	50

Student Contact Hours Per Week: **32 Hrs.**

THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH.

Total Marks **: 850**

@ - Internal Assessment, # - External Assessment, $ - Common to All Conventional Diploma, #* - Online Examination, [   ] No Theory Examination, Ø - Common for TX, TC, DC

Abbreviations: TH-Theory, TU- Tutorial, PR-Practical, OR-Oral, TW- Termwork, SW- Sessional Work.
  ➢ Conduct two class tests each of 25 marks for each theory subject. Sum of the total test marks of all subject are to be converted out of 100 marks as sessional work (SW).
  ➢ Progressive evaluation is to be done by subject teacher as per the prevailing curriculum implementation and assessment norms.
  ➢ Code number for TH, PR, OR and TW are to be given as suffix 1, 4, 8, 9 respectively to the subject code.

Course Name : All Branches of Diploma in Engineering & Technology

Course Code : AE/CE/CH/CM/CO/CR/CS/CW/DE/EE/EP/IF/EJ/EN/ET/EV/EX/IC/IE/IS/

  ME/MU/PG/PT/PS/CD/CV/ED/EI/FE/IU/MH/MI/DC/TC/TX/AU

Semester   : Second

Subject Title : Communication Skills

Subject Code : 17201

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
02	--	02	03	100	--	25#	25@	150

NOTE:

> **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**

> **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work. (SW)**

Rationale:

In this age of globalization, competition is tough. Hence effective communication skills are important. Communication skills play a vital and decisive role in career development. The subject of Communication Skills introduces basic concepts of communication. It also describes the verbal, non-verbal modes and techniques of oral & written communication.
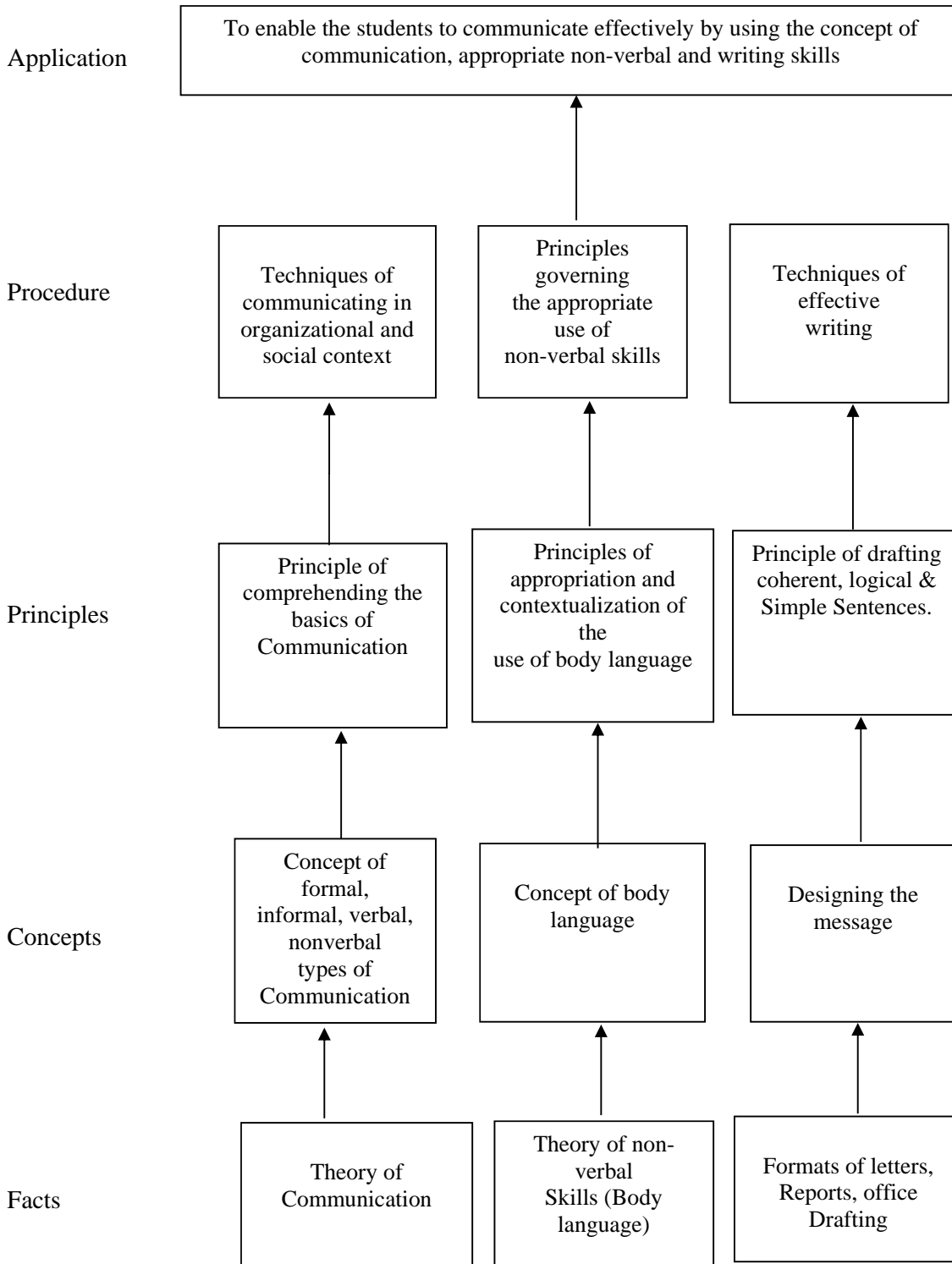
It will guide and direct to develop a good personality and improve communication skills.

General Objectives:

 Students will be able to:

1. Utilize the skills necessary to be a competent communicator.

2. Select and apply the appropriate methods of communication in various situations.

Learning Structure:

Application

> To enable the students to communicate effectively by using the concept of communication, appropriate non-verbal and writing skills

Procedure

> Techniques of communicating in organizational and social context

> Principles governing the appropriate use of non-verbal skills

> Techniques of effective writing

Principles

> Principle of comprehending the basics of Communication

> Principles of appropriation and contextualization of the use of body language

> Principle of drafting coherent, logical & Simple Sentences.

Concepts

> Concept of formal, informal, verbal, nonverbal types of Communication

> Concept of body language

> Designing the message

Facts

> Theory of Communication

> Theory of non-verbal Skills (Body language)

> Formats of letters, Reports, office Drafting

Theory

Name of the Topic	Hours	Marks

Topic 01 - Introduction to Communication:
 	
Specific Objective:
 	
  ➢ Describe the process of communication.
 	
Contents:
    • Definition of communication
    • Process of communication
    • Types of communication -- Formal, Informal, Verbal, Nonverbal, Vertical, Horizontal, Diagonal
	06	**16**

Topic 02 - Effective communication
 	
Specific Objective:
  ➢ Identify the principles and barriers in the communication process
 	
Contents:
 	
    ❖ Principles of communication.
    ❖ Barriers to communication
  a. **Physical Barrier**:
    ❖ Environmental (time, noise, distance & surroundings),
    ❖ Personal (deafness, stammering, ill-health, spastic, bad handwriting)
  b. **Mechanical** : Machine oriented
  c. **Psychological:** Day dreaming, prejudice, emotions, blocked mind, generation gap, phobia, status inattentiveness, perception.
  d. **Language** : Difference in language, technical jargons, pronunciation & allusions.
	08	**20**

Topic 03 - Non verbal & Graphical communication:
Specific Objectives:
  ➢ Effective use of body language & nonverbal codes
  ➢ View and interpret graphical information precisely.
 	
Contents:
3.1 Non- verbal codes: [08 Marks]
    • Proxemics,
    • Chronemics
    • Artefacts
3.2 Aspects of body language (Kinesics)   [10 Marks]
    • Facial expression
    • Eye contact
    • Vocalics, paralanguage
    • Gesture
    • Posture
    • Dress & appearance
	08	**28**

• Haptics
3.3 Graphical communication   [10 Marks]
 	
   • Advantages & disadvantages of graphical communication
   • Tabulation of data & its depiction in the form of bar graphs & pie charts.		

Topic 04 - Listening
Specific Objective:
 	
➢ Effective use of listening
 	
Contents:
   • Introduction to listening
   • Listening versus hearing
   • Merits of good listening
   • Types of listening.
   • Techniques of effective listening.
	02	**08**

Topic 05 - Formal Written Communication
Specific Objectives:
➢ Use different formats of formal written skills.
 	
Contents:
   • Office Drafting: Notice , memo & e-mail
   • Job application with resume.
   • Business correspondence: Enquiry letter, order letter ,complaint letter, adjustment letter.
   • Report writing: Accident report, fall in production, investigation report.
   • Describing objects & giving instructions
	08	**28**

TOTAL	**32**	**100**

Skills to be developed in practical:

Intellectual Skills:

     1. Analyzing given situation.

     2. Expressing thoughts in proper language.

Motor Skills:

     1. Presentation Skills focusing on body language.

     2. Interpersonal skills of communication

Journal will consist of following assignments:

01: Draw the diagram of communication cycle for given situation.

    State the type and elements of communication involved in it.

02: Graphics:-   a) Draw suitable bar-graph using the given data.
                b) Draw suitable pie-chart using the given data.

03: Role play: Teacher should form the group of students based on no. of characters in the situation. Students should develop the conversation and act out their roles.

04: Collect five pictures depicting aspects of body language from different sources such as magazines, newspapers, internet etc. State the type and meaning of the pictures.

NOTE: The following assignments should be performed by using Software provided by MSBTE

05 Practice conversations with the help of software.

06 Describe people/personalities with the help of software and present in front of your batch for three minutes.

07 Prepare and present elocution (three minutes) on any one topic with the help of software.

08 Describe any two objects with the help of software.

Learning Resources:

Sr. No.	Author	Title	Publisher
01	MSBTE, Mumbai.	Text book of Communication Skills	MSBTE, Mumbai.
02	MSBTE, Mumbai.	CD On Communication Skills	MSBTE
03	Joyeeta Bhattacharya	Communication Skills	Reliable Series
04	Communication Skills	Sanjay Kumar, Pushpa Lata	Oxford University Press

Web Sites for Reference:

Sr. No	Website Address
01	Website: www.mindtools.com/page8.html-99k
02	Website: www.khake.com/page66htm/-72k
03	Website: www.BM Consultant India.Com
04	Website: www.letstak.co.in
05	Website: www.inc.com/guides/growth/23032.html-45k

Course Name : Diploma in Textile Manufactures / Diploma in Textile Technology / Diploma

                         in Fashion & Clothing Technology

Course Code : TX/TC/DC

Semester   : Second

Subject Title : Mathematics and Statistics

Subject Code : 17217

Teaching and Examination Scheme:

Teaching scheme			Examination scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
04	01	--	03	100	--	--	--	100

Note:

  ➢ **Two   tests   each of 25 marks   to be conducted as per the schedule given by the MSBTE.**

  ➢ **Total   of test   marks   for all the theory subjects are to be converted out of 50 and to**

     be entered   in mark sheet under the head Sessional Work (SW).

Rationale:

        Mathematics is the foundation of science and technology. The study of **Applied Mathematics**
is   helpful to   understand concepts of Engineering. This subject enhances logical thinking capability
and   also improves the   systematic approach in solving engineering problem.

Derivative is helpful for finding slope, tangent line, and normal line of the curve.
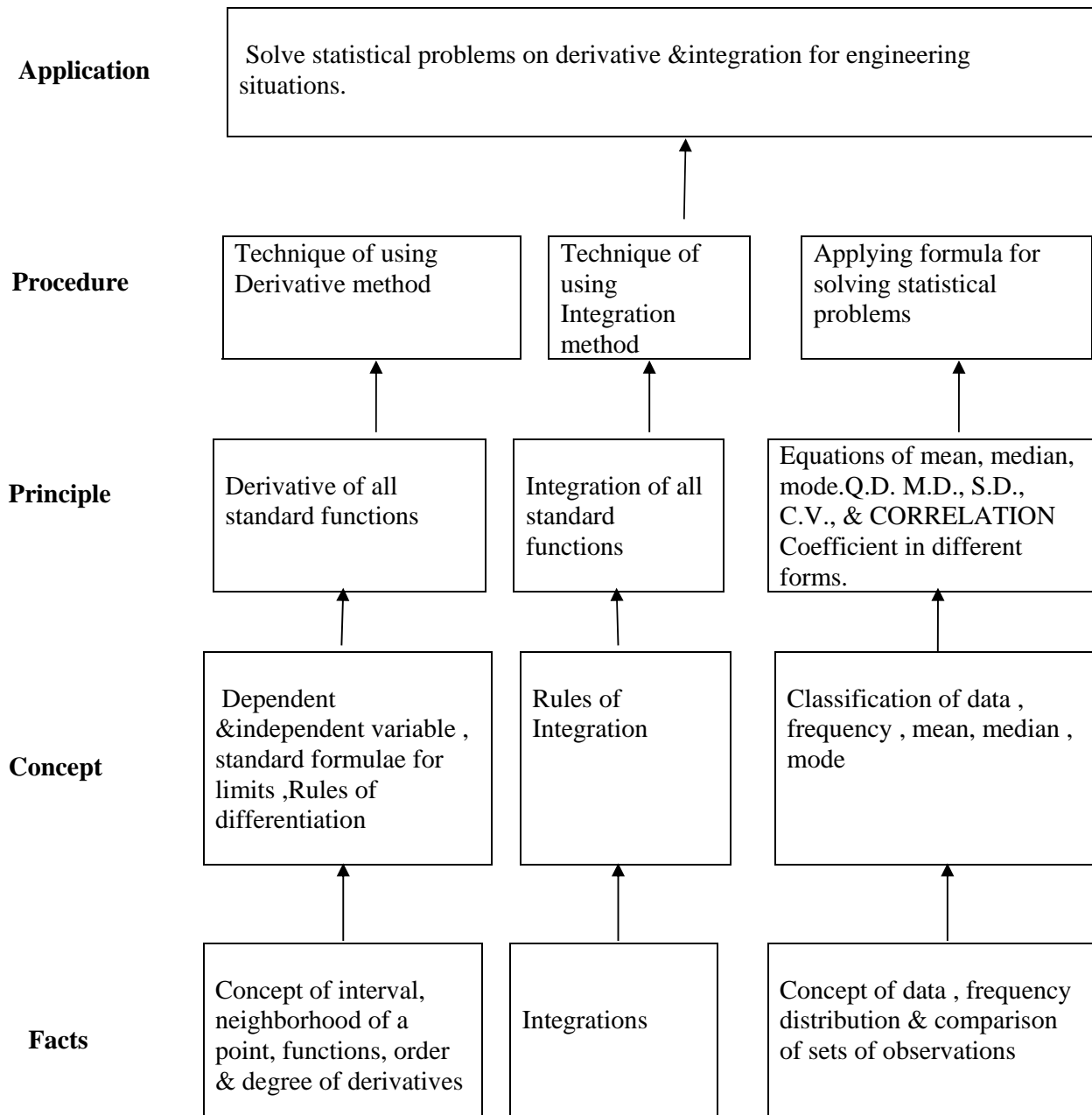
Integration provides area & volume of the curve.

Measures of central tendency, Measures of dispersion, Correlation & Lines of Regression
plays an important role in Textile subjects. Contents of this subject will form foundation for further
study in mathematics.

General Objectives: **Student will be able to**

  1. Acquire knowledge of mathematical terms, concepts, principles & different methods for
     studying engineering & technological problems.

  2. Understand the relationship between two variables.

  3. Apply derivative & integration to solve engineering & technological problems

  4. Locate the exceptional & critical points in an engineering system & come to a valid
     conclusion.

Learning Structure:

Application

Solve statistical problems on derivative &integration for engineering situations.

Procedure

Technique of using Derivative method	Technique of using Integration method	Applying formula for solving statistical problems

Principle

Derivative of all standard functions	Integration of all standard functions	Equations of mean, median, mode.Q.D. M.D., S.D., C.V., & CORRELATION Coefficient in different forms.

Concept

Dependent &independent variable , standard formulae for limits ,Rules of differentiation	Rules of Integration	Classification of data , frequency , mean, median , mode

Facts

Concept of interval, neighborhood of a point, functions, order & degree of derivatives	Integrations	Concept of data , frequency distribution & comparison of sets of observations

Theory

Topic and Contents	Hours	Marks

Topic 1: Function and Limit
Specific objectives:
1.1   Function
Specific objectives:
  ➢ Identify types of functions.
 	
  • Definitions of variable, constant, intervals such as open, closed, semi – open etc.
  • Definition of function, value of a function and types of functions with simple examples.
	02	**04**

1.2   Limit
Specific objectives:
  ➢ Find limits for all different functions
 	
  • Definition of neighborhood, concept and definition of Limits & its standard properties.
  • Definition & properties of continuities only (problems not expected)
  • Limits of algebraic, exponential and logarithmic functions with simple examples.
	06	**06**

Topic 2: Derivatives
Specific objectives:
  ➢ Perform all algebraic operations on derivatives
  ➢ Find slope, tangent line, & normal line of the given curve.
 	
  • Definition of derivatives & notations.
  • Derivatives of all standard functions.
  • Rules of Differentiation (without proof) such as sum, difference, scalar multiplication, product & quotient.
  • Derivatives of Composite Functions (chain rule)
  • Derivatives of Implicit functions.
  • Derivatives of inverse trigonometric functions.
  • Logarithmic differention
  • Derivatives of parametric functions.
  • Applications of derivative:- slope, tangent line, normal line, & maxima & minima of a curve
	14	**20**

Topic 3: Integration
Specific Objectives:
  ➢ Find indefinite & definite integration of different functions.
 	
  • Definition of integration.
  • Integration of all standard functions.
  • Rules of Integration such as sum, difference, scalar multiplication, &product.
  • Methods of integration:-
    a) Integration by substitution
    b) Integration by rational functions
    c) Integration by partial fractions
    d) Integration by trigonometric transformations
	12	**20**

e) Integration by parts rule • Definition & properties of definite integration • Simple problems on definite integration		

Topic 4: Basic concepts & Measures of Central Tendency
Specific objectives:
    ➢ Prepare a frequency distribution table.
    ➢ Find mean, median & mode by analytical & graphical method.
 	
    • Definition of class boundaries, class limits, class marks, preparation of frequency distribution table, less than cumulative frequency & greater than cumulative frequency table.
    • Arithmetic mean & combined mean
    • Median by analytical & graphical method (OGIVE method)
    • Mode by analytical & graphical method (Histogram method)
	10	**16**

Topic 5: Measures of Dispersions
Specific objectives:
    ➢ Find Q.D., M.D., S.D., & Coefficient of Variation.
    ➢ Compare variation between the two sets.
 	
    • Partition values like quartiles, deciles & percentiles
    • Definition & types of measures of dispersions
    • Absolute & Relative measures of range , inter-quartile range, quartile deviation , mean deviation , standard deviation, combined standard deviation
    • Variance & coefficient of variation
    • Comparison of two sets of observations.
	10	**18**

Topic 6 : Correlation & Lines of Regression
6.1 Correlation
Specific objectives:
    ➢ Find correlation between two variables using various methods.
 	
    • Introduction and Types of correlation
    • Method of studying correlation
      a) Scatter Diagram
      b) Karl Pearson's co-efficient of correlation.
      c) Spearman's Rank correlation co-efficient.
6.2 Lines of Regression
Specific objectives:
    ➢ Find equations of lines of regression using correlation coefficient.
 	
    • Introduction of linear regression
    • Lines of Regression a) X on Y b) Y on X
    • Relation between coefficient of correlation & regression coefficient.
	10	**16**

Total	**64**	**100**

Tutorials:
Note: 1) Tutorials are to be used to get enough practice.
    2) Make group of 20 students and for each group minimum 10 problems are to be given.

List of Tutorials

Sr. No.	Topic for Tutorial
1	Function and Limit
2	Derivatives
3	Derivatives
4	Integrations
5	Integrations
6	Basic concepts & Measures of central Tendency
7	Measures of Dispersions
8	Measures of Dispersions
9	Correlation
10	Lines of Regression

Learning Resources:
  1) Books:

Sr. No.	Title	Authors	Publication
1	Higher engineering mathematics	B. S. Grewal	Khanna publication
2	Advanced Engg. Mathematics	H.K.Dass	S. Chand
3	Fundamentals of Statistics	S.C.Gupta	S. Chand
4	Calculus: single variable	Robert T. Smith	Tata McGraw Hill
5	Applied Mathematics	P. N. Wartikar	Pune Vidyarthi Griha Prakashan,

  2) Websites :
    i) www.khan Academy
    ii) www.wikipedia.com

Course Name : Diploma in Textile Technology

Course Code : TC

Semester   : Second

Subject Title : Organic Chemistry - I

Subject Code : 17221

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	03	100	50@	--	--	150

NOTE:
  ➢ **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
  ➢ **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work. (SW)**

Rationale:

Organic chemistry is one of the subjects that provide the basic knowledge of the organic Compounds, which are used in all types of processes in chemical processing of the textiles. The textile chemist should possess this knowledge to anticipate the effects of the chemicals used during the processing not only to control the process but also to avoid the reprocessing in the wet processing. Synthetic dyes and auxiliaries are based on organic chemistry and are used in the chemical processing very widely. This subject is intended to impart necessary knowledge in this area.

Objectives:

The students will be able to:

  • Understand the fundamentals of dyestuffs.

  • Understand the fundamentals of auxiliaries.

  • Conceive thorough ideas regarding the role of organic chemicals in textile wet processing.

  • Understand the use of organic chemicals in laboratories.

Learning Structure:

Application | To know the properties & preparation to get suitability of compounds in Textile processing.

↑

Procedure | Preparation of alcohols, carboxylic acids, aldehydes & ketones, urea formaldehyde resin, Separation of protein.

↑

Principle | Wurtz reaction for alkanes, IUPAC system for Alkane, Alkenes, Alkynes, Alcohols, Carboxylic acids. Homologous series of carbon compound.

↑

Concept | Structure of Alkanes, isomerism, hydrolysis, dehydration, halogination, nitration, sulphonation & pyrolysis of alkanes.

↑

Facts | Formaldehyde, Acetaldehyde, halogens, alkanes, amino acids

Contents – Theory

Topic and Contents	Hours	Marks

Topic 1: Theory of Carbon Compounds
 	
Specific Objectives
  ➢ State the characteristic of carbon compounds.
  ➢ Identify the class of organic compound
  • Characteristics of organic compounds,
  • Classification of organic compounds on the basis of the structure and functional group.
  • Homologues series.
	04	**08**

Topic 2 : Organic Reactions
 Specific Objectives
  ➢ Predict the type of organic reaction
  ➢ Describe the mechanism of SN1 and SN2 reaction
  2.1 General nature of organic reactions, the breaking and formation of bonds Electrophile and necleophile, carbocation and carbanion, carbene
  2.2 Types of organic reactions
  ➢ Addition reaction ,Elimination reaction ,Rearrangement reaction substitution reactions
  ➢ Mechanism of Nucleophilic substitutions SN1 & SN2
	06	**14**

Topic 3 : Aliphatic Hydrocarbons
Specific Objectives
  ➢ Distinguish between - alkane and alkenes, alkynes and alkenes
  ➢ Identify the reagents required for sulphonation, Nitration, halogenationation and products.
3.1 Alkanes
Introduction, Structural formulae of methane, ethane & propane, straight chain and branched chain alkanes, Isomerism, Nomenclature of Alkanes: Trivial or common names, IUPAC nomenclature,
Methods of preparation electrolytic method, By reduction of alkyl halides, By Wurtz reaction or synthesis, By catalytic hydrogenation of unsaturated hydrocarbons.
Physical & chemical properties: Reactions of alkanes like halogenations, nitration, pyrolysis), Uses of Alkanes: as fuel, as solvent, as lubricant, as a source of carbon black & other uses.
3.2 Alkenes
Introduction, Definition, General formula,
Nomenclature : Trivial & IUPAC system, Isomerism, Structural formula and electronic formula of ethylene Methods of preparation, a) By dehydration of alcohols, b) by de-hydrohalogenation of alkyl halides c) by thermal and catalytic cracking,
Physical & chemical properties (Addition of halo acids, addition of halogens, catalytic hydrogenation), Industrial uses of alkenes.
3.3 Alkynes (Acetylenes)
Introduction, Definition, General formula, Nomenclature: IUPAC system, structural formula of Ethyne,
Preparation : a) by de-hydrohalogenation, b) by the action of water on metallic carbide, Physical & chemical properties (addition of helogens, addition of haloacids, addition of Sulphuric acid,addition of water, & Uses.
	10	**24**

Topic 4 :Alcohols
Specific Objectives
  ➢ Identify the type of alcohol
  ➢ Select the method of preparing alcohol
Introduction, Structure and nomenclature, Classification, , Definition of absolute alcohol, methlylated spirit, power alcohol, Ethyl alcohol: Preparation of ethanol a) Synthesis on technical scale from ethylene (from cracked petroleum), b) Reduction of acetaldehyde by passing its vapours, mixed with hydrogen over finely divided nickel (catalyst)
Physical and chemical properties and uses of ethanol
Preparation properties and uses of glycol and glycerol.
	07	**14**

Topic 5 : Aldehydes & Ketones
Specific Objectives
  ➢ Distinguish between - aldehyde and ketones
  ➢ Identify the reagents required for preparation of aldehyde and ketones
  ➢ Describe the method of preparing urea formaldehyde resin
5.1 Aldehydes Introduction, Nomenclature of aldehyde and ketones, preparation of Formaldehyde & Acetaldehyde a) from methyl alcohol, From acetylenes
Chemical properties: a) addition reactions. b) Substitution reaction. c) Reaction with Fehling's solution, d) reaction with Tollen's reagent, e) reaction with ammonia, uses: for manufacture of urea formaldehyde resin and other uses
5.2 Acetone: (Dimethyl Ketone) preparation from: a) isopropyl alcohol, b) acetic acid, c) acetylene. Chemical properties of acetone, uses of acetone.
	07	**14**

Topic 6 : Carboxylic Acids
Specific Objectives
  ➢ Identify the given class of carboxylic acid
  ➢ Predict the reagent required for preparing carboxylic acids.
Introduction 1) Nomenclature, classification of carboxylic acid
Acetic acid : preparation **:** a) by hydrolysis of cyanides, b) from Grignard reagent, c) By heating a dicarboxylic acid having two – COOH groups attached to same carbon atom,
Properties : Physical properties, Chemical reactions - Formation of salts Formation of acid chlorides, d) formation of paraffin (reduction), e) formation of amides, uses.
Oxalic acid (Ethanedionic acid) : Preparation, a) by oxidation of glycols,
Properties: a) effect of heat, b) Acidic nature, c) reaction with KOH , d) reaction with ethyl alcohol, uses.
	08	**14**

Topic 7 : Amino Acids and Proteins
Specific Objectives
  ➢ Identify the types of amino acid
  ➢ Describe the method of separating proteins
7.1 Amino acids
Introduction, amino acids, nature of amino acids and classification, chemical properties of amino acids,
7.2 Proteins
Nature of Proteins, separation of proteins, classification of proteins, Isoelectric point.
	06	**12**

Total	**48**	**100**

Intellectual Skills:
> 1) Understanding preparation of nitrobenzene.
> 2) Analyzing amide & nitro group.
> 3) Learn purification method.

Motor Skill:
> 1) Extraction of solvents.
> 2) Identifying melting & boiling point.

List of Experiments:
1. Determination of melting point. (Solids)
2. Determination of boiling point. (Liquids)
3. Detection of Nature of given Organic Compound
4. Detection of functional groups like – COOH, Phenolic OH, -CHO, >C=O, Aromatic – NH_2, $-NO_2$, $-SO_3H$.
5. Detection of elements: sodium fusion test. (Lassaigne's test)
6. Methods of purification by simple distillation.
7. Methods of purification by crystallization
8. Extraction with solvents.
9. Methods of purification by fractional distillation
10. Identification of given organic compound by organic qualitative analysis

Learning Resources:
Books:

Sr. No.	Author	Title	Edition	Year of Publication	Address of Publisher
1	P. L. Soni & H. M. Chawla	Text Book of Organic Chemistry	27th	1997	Sultan Chand & Sons, New Delhi
2	Arun Bahl & B. S. Bahl	Text Book of Organic Chemistry	15th	1999	Sultan Chand & Sons, New Delhi
3	R. T. Morrison & R. N. Boyd	Organic Chemistry	--	--	Allyn & Bacon Inc., Boston
4	R. K. Bansal	Text Book of Organic Chemistry	3rd	--	New Age International (P) Ltd, New Delhi
5	G. L. Patric	Instant Notes Organic Chemistry	--	--	Viva Books Pvt. Ltd, New Delhi

Course Name : Diploma in Textile Technology

Course Code : TC

Semester   : Second

Subject Title : Physical Chemistry

Subject Code : 17222

Teaching & Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	03	100	@ 50	--	--	150

Note:

> ➢ **Two tests each of 25 marks to be conducted as per schedule given by MSBTE.**

> ➢ **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head sessional work.**
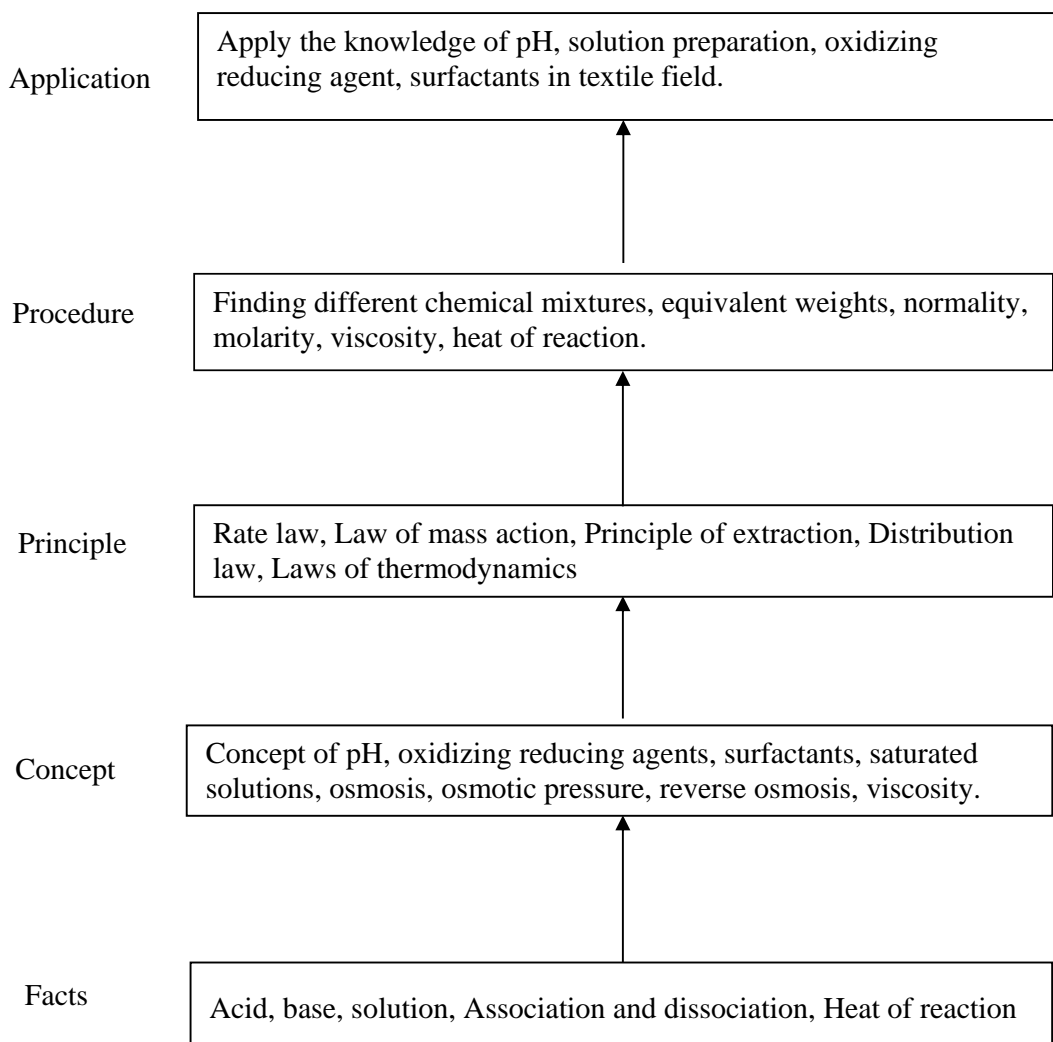
Rationale:

     Chemistry, one of the pure sciences, is the most relevant subject to the textile field. Therefore knowledge of the subject is essential especially for the value-adding sector of textiles viz. chemical processing of textiles.

     Physical chemistry deals with various principles and theories governing the chemical changes of matter. The subject is involved at each and every stage in the chemical processing of textiles. Preparation of dye liquors, printing pastes, different solutions requires understanding of basic concepts like the concepts of adsorption, absorption, solubility, The desizing of textiles requires the understanding of extraction theory. The assessment of bleaching process requires the knowledge of reaction kinetics. To know the rheology of sizing materials, printing pastes, the concept of viscosity is very important. While preparing different solutions of various concentrations, the concepts of equivalent weights, normality, molarity etc. are very much required. Therefore it is customary for the students and technocrats of this sector to acquire the thorough knowledge of the subject. Therefore, this subject is devised in such a way that it will impart all this knowledge of fundamentals of chemistry.

Objectives:

The students will be able to:
- Learn the concepts of acids, bases, pH, pOH and buffers etc.
- Correlate the fundamental concepts of thermodynamics, thermo chemistry and the extraction theory to textile wet processing.
- Understand the relevance of study of solutions, chemical kinetics and equilibrium to wet processing of textiles.
- Apply the knowledge of pH, reduction, oxidation in textile application.
- Understand the methods of preparing solutions of various concentrations.
- Use surface active agents in textile wet processing.

Learning Structure:

Application	Apply the knowledge of pH, solution preparation, oxidizing reducing agent, surfactants in textile field.

↑

Procedure	Finding different chemical mixtures, equivalent weights, normality, molarity, viscosity, heat of reaction.

↑

Principle	Rate law, Law of mass action, Principle of extraction, Distribution law, Laws of thermodynamics

↑

Concept	Concept of pH, oxidizing reducing agents, surfactants, saturated solutions, osmosis, osmotic pressure, reverse osmosis, viscosity.

↑

Facts	Acid, base, solution, Association and dissociation, Heat of reaction

Contents – Theory

Topic and Contents	Hours	Marks

Topic 1: Acids and Bases
Specific Objectives
  ➢ Distinguish between acid and base.
  ➢ Identify pH and role in textile wet processing.
  ➢ State use of salt in wet processing.
1.1 Definition of acid and base
  • Arrhenius concept, Lewis concept.
  • Classification of acids and bases depending upon number of H^+ and OH^- present in acids and bases respectively.
  • Concept of strength of acid and base.
1.2 Concept of pH and pH scale, Mathematical expression of pH, Importance of pH in textile wet processing - in dyeing and printing, Role of alkali liberating, acid liberating agent in wet processing.
1.3 Salts
  ➢ Definition, Classification of salts, Use of salt in textile processing.
	10	**20**

Topic 2: Solutions
Specific Objectives
  ➢ Identify the method of preparing solution of different concentrations
  ➢ Describe the mechanism of osmosis.
2.1 Definition of solution, Need of preparing solutions
  ➢ Concentration terms – Normality, molarity, preparation of solution – (i) liquid-liquid (volume by volume) (ii) solid-liquid (weight by volume)
  ➢ Saturated solution, concept.
  ➢ Definition, concept and process of osmosis, osmotic pressure and reverse osmosis.
  ➢ Viscosity – Definition, factors affecting viscosity.
  ➢ Evidence of these concepts in textile processing and also of types of solutions used in textile wet processing.
2.2 Colloids
Definition of colloids, classification, hydrophilic sols, hydrophobic sols, Emulsions – Oil in water, water in oil.
	10	**20**

Topic 3: Chemical Kinetics and Equilibrium
Specific Objectives
➢ Distinguish between i) reversible and irreversible reaction ii) endothermic and exothermic reaction
➢ Identify the role of various factors affecting on rate of chemical reaction.
The meaning of kinetics and equilibrium of chemical reactions
  ➢ Study of types of reactions e.g. Reversible, irreversible, exothermic and endothermic.
  ➢ Definition of rate of chemical reaction, rate constant of chemical reaction.
  ➢ Statement of law of mass action, definition of equilibrium constant and order of reaction.
Factors affecting the rate of chemical reaction in textile wet processing. e.g. Diazotization reaction, polyester dyeing at high temperature, reactive dyeing, cold brand at room temperature but hot
	06	**14**

brand at 60 to 80° C.		
Topic 4: Surfactants **Specific Objectives** ➢ Distinguish between emulsifying agent and dispersing agent. ➢ Identify the role of surfactants. **4.1** Concepts and definition of surface tension, Interface, Interfacial tension, Cohesive force, Adhesive force. **4.2 Meaning of terms** • Emulsifying agent • Dispersing agent • Wetting agent Evidence of above terms in textile wet processing	**06**	**12**

Topic 5: Oxidation and Reduction
 Specific Objectives
 ➢ Predict oxidizing and reducing agent for particular wet process.
 ➢ Identify the role of oxidizing and reducing agent in textile wet processing.
 5.1 Oxidation and Reduction
 • Definition of oxidation with suitable chemical reaction
   - Addition of oxygen
   - Removal of oxygen
   - Removal of electron
 • Definition of reduction with suitable chemical reaction
 • Concept of oxidizing and reducing agent
 5.2 Applications of following oxidizing and reducing agents in textile wet processing – $K_2Cr_2O_7$, $Na_2S_2O_4$, Na_2S, $NaOCl$, H_2O_2
 a) in vat dyeing, b) in sulphur dyeing, c) peroxide dyeing, d) printing using $SnCl_2$, e) use of sodium m nitro benzene sulphonate as oxidizing agent for preventing hydrolysis of reactive dyes.
	08	**16**

Topic 6: Thermodynamics and Thermochemistry
 Specific Objectives
 ➢ State the applications of laws of thermodynamics.
 ➢ State the applications of heat of reactions in textiles.
 • The meaning of thermodynamics and thermochemistry.
 • Statement of First and Second law of thermodynamics, Applications.
 • Definition, chemical equation of –
   a) Heat of formation
   b) Heat of combustion
   c) Heat of solution
   d) Heat of dilution
   e) Heat of neutralization
 • Applications in textiles
	05	**10**

Topic 7: Distribution and Extraction Theory ➢ Identify process of extraction for given mixture of solution. ➢ Select dissociation or association process for given solution. • The statement, explanation and limitations of Distribution Law. • Definition of Dissociation and Association. • Application of Distribution Law • Theory of extraction : Principle, Process, Application	**03**	**08**
TOTAL	**48**	**100**

Intellectual Skills:
- Identify pH of given solutions
- Identify method of preparation of solution.

Motor Skill:
- Observe chemical reactions.
- Measure quantities accurately.
- Handle apparatus carefully.

List of Experiments:
1. Determination of pH of different solution by pH meter and universal indicator.
2. Preparation of solutions of different concentration using given standard solution (Volume by volume method).
3. Preparation of solutions (Solid-liquid Weight by volume method).
4. Preparation of normal solutions.
5. Determination of viscosity of different liquids by Ostward's Viscometer.
6. Determination of strength of peroxide.
7. Determination of heat of displacement of copper by iron.
8. Determination of heat of displacement of zinc by iron.
9. Determination of heat of neutralization of strong acid by strong base.
10. Separation of immiscible liquids using separating funnel.

Learning Resources:
Books:

Sr. No.	Author	Title	Edition	Year of Publication	Publisher
1	Jain & Jain	Engineering Chemistry	13th	2001	Danpatrai Publishing Co., 4787/23, Ansari Road, Dariyaganj, New Delhi.
2	P.C. Rakshit	Physical Chemistry	2nd	1995	Sarat Book House, Kolkata.
3	Dr. I. R. Gambhir	Physical Chemistry	1st	1990	Kedarnath Ramnath, 132, College Road, Meerut – 250001.

Course Name : Diploma in Textile Technology

Course Code : TC

Semester   : Second

Subject Title : Chemistry of Natural Fibers

Subject Code : 17223

Teaching & Examination Scheme

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	--	03	100	--	--	--	100

NOTE:

➢ **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**

➢ **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work. (SW)**
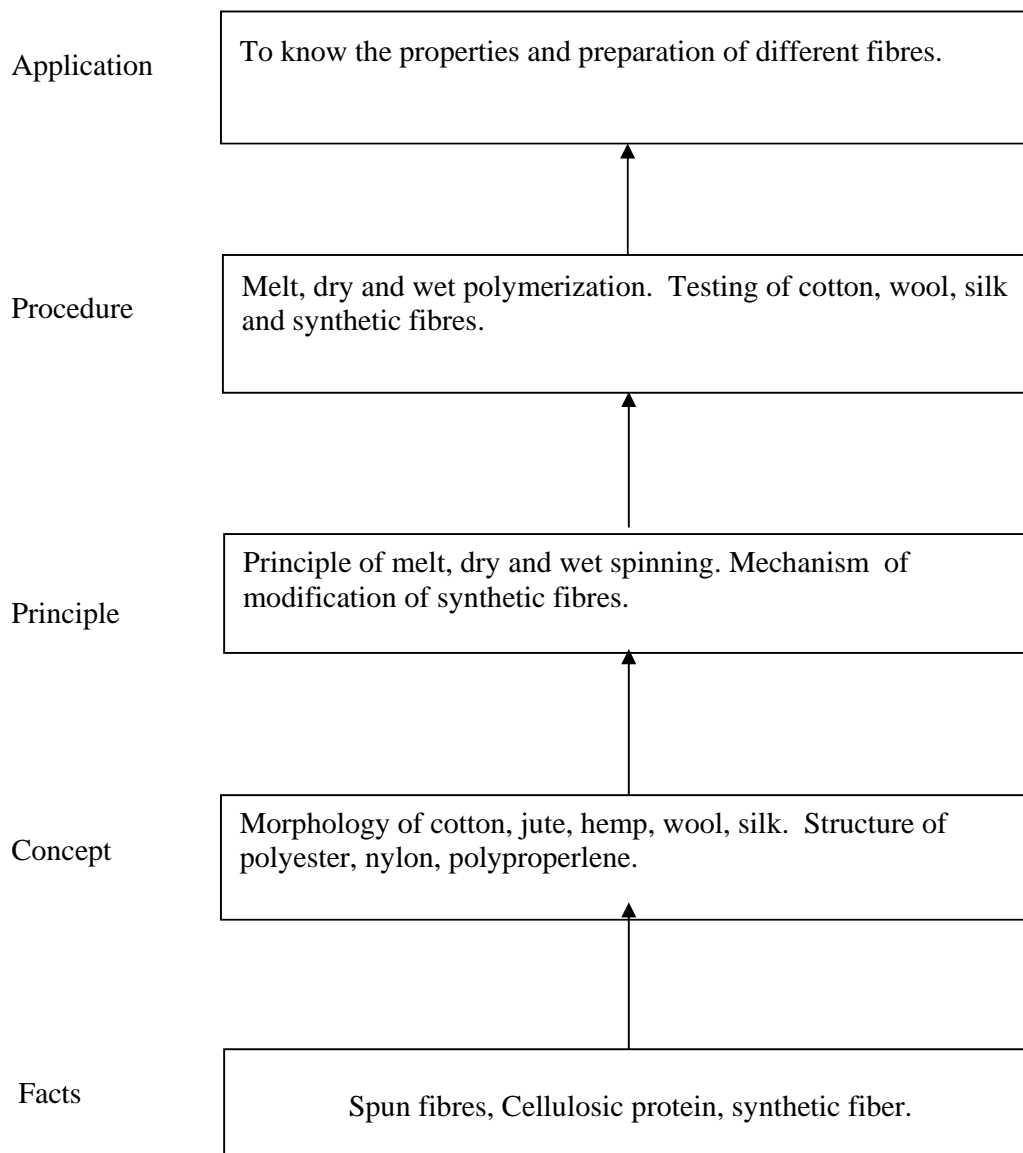
Rationale:

Chemical processing of textiles is an art of improving the overall value various fibrous materials. These textile fibres are from natural as well as man made origin. The processing technologist must have the adequate knowledge of these natural fibers as there are special methods to treat them.

Objectives:

The students will be able to:

1. Study cultivation of various natural fibers and their properties.
2. Study manufacturing processes and properties of regenerated textile fibers.
3. To study unconventional natural fibers.

1

Learning Structure:

Application

To know the properties and preparation of different fibres.

↑

Procedure

Melt, dry and wet polymerization. Testing of cotton, wool, silk and synthetic fibres.

↑

Principle

Principle of melt, dry and wet spinning. Mechanism of modification of synthetic fibres.

↑

Concept

Morphology of cotton, jute, hemp, wool, silk. Structure of polyester, nylon, polyproperlene.

↑

Facts

Spun fibres, Cellulosic protein, synthetic fiber.

Theory Contains:

Chapter	Name of the Topic	Hours	Marks
01	**Terminologies in Fibres and spinning :** **Specific Objective:** Students will be Able to list the types of fibers Identify requirements for spinning processes 1.1 Terminologies related to fibre, yarn and fabrics. Definition of fibre, filament, degree of polymerization. 1.2 Classification of fibres according to their chemical nature 1.3 Essential and desirable properties of fibres. 1.4 Concept of crystalline, mesomorphous, amorphous region and their importance. 1.5 Essential requirements of dry , & wet spinning	12	24
02	**Cotton** **Specific Objective:** Students will be able to Draw morphological structure of cotton Identify the damage in cotton by chemical tests 2.1 Cultivation of cotton 2.2 Varieties of cotton. 2.3 Morphological structure of cotton. 2.4 Chemistry of cellulose concept of chemical bonding in cotton. 2.5 Physical and chemical properties of cotton. 2.6 Chemistry of damage to cellulose. 2.7 Chemical methods of detection of oxycellulose and hydrocellulose.	08	20
03	**Regenerated Cellulosic Fibres** **Specific Objective:** Students will be able to **Identify the fiber for which given manufacturing process** **List physical chemical properties of given fibers** **Identify fibers based on defect** 3.1 Manufacturing process of viscose rayon. 3.2 Flow chart for manufacturing process 3.3Functions of various additives used in the manufacture of viscose rayon. 3.4 Physical and chemical properties, of viscose ray on 3.5 Brief manufacturing process of polynosic, High wet modules Fiber 3.6 Physical and chemical properties and uses of polynosic, HWMF 3.7 Brief manufacturing process of Lyocell fibre 3.8 physical and chemical properties and uses of lyocell fibre.	08	16

04	**Modified Cellulosic Fibres** **Specific Objective:** Students will be able to Identify the fiber for which given manufacturing process List physical chemical properties of given fibers 4.1 Raw material, manufacturing process of cellulose acetate, cellulose triacetate 4.2 Concept of homogeneous and heterogeneous acetylation 4.3 physical and chemical properties and uses of cellulose acetate and cellulose triacetate	06	10
05	**Animal Fibres:** **Specific Objective:** Students will be able to Draw morphology of protein fibers Identify the fibers based on its chemical properties. 5.1 Varieties of silk production of raw silk-. 5.2 Sericulture & reeling. 5.3 Morphological structure and Chemical composition of silk, 5.4 physical and chemical properties of silk. 5.5 Degumming of silk. 5.6 Source & grading of wool fibre. 5.7 Morphological structure of wool 5.8 Chemical composition and physical and chemical properties of wool.	08	20
06	**Unconventional Natural Fibres** **Specific Objective:** Students will be able to **Identify the different bast fibers** **List the physical and chemical properties of fibers** 6.1 Classification of bass fibres. 6.2 Cultivation of jute & flax. 6.3 Morphological structure, chemical composition uses of jute and flax fibre. 6.4 Extraction, physical properties , chemical properties uses of banana fibres and coir fibres	06	10
	Total	**48**	**100**

Learning Resources:
Books:

Sr. No	Author	Title	Edition	Year of Publication	Publisher & Address
1	Dr. V.A.Shenai	Textile Fibres Vol. I	3rd	1991	Sevak Publication
2	R.W.Manorieff	Manmade Fibres	4th	1966	Hey Wood Books, London
3	Dr.H.V. Shreenivasa Murthy	Introduction to Textile Fibres	2nd	1987	The Textile Association, India
4	Dr. S.P.Mishra	A Text Book of Fibre Science and Technology	2nd	2000	New Age International (P) Ltd.

5	Steven B.Warner	Fibre Science	3rd	1995	Prentice Hall
6	Dr. V. B. Gupta & V. K. Kothari	Manufactured Fibre Technology	2nd	1997	Chapman & Hall
7	Hongu & Phillips	New Fibers	3rd	1997	Wood Head Publishing Ltd.

Course Name : All Branches of Diploma in Engineering and Technology.

Course Code : AE/CE/CH/CM/CO/CR/CS/CW/DE/EE/EP/IF/EJ/EN/ET/EV/EX/IC/IE/IS/

               ME/MU/PG/PT/PS/CD/CV/ED/EI/FE/IU/MH/MI/DC/TC/TX

Semester   : First

Subject Title : Computer Fundamentals

Subject Code : 17002

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
01	--	04	--	--	50#*	--	25@	75

   * On Line Examination

Rationale:

       Since early 21st Century the use of Computer has been so rapidly that it is difficult to think of an area where computers are not being used. It is very desirable that everyone should have good knowledge of computer.

       Main purpose of this subject is how to use a computer for basic needs. This subject covers application softwares like MS-Word, MS-Excel, MS- PowerPoint.

       It is a gateway to wonderful world of information and part of various applications like business, academic, hospitals, construction, designing, chemical fields and many more.
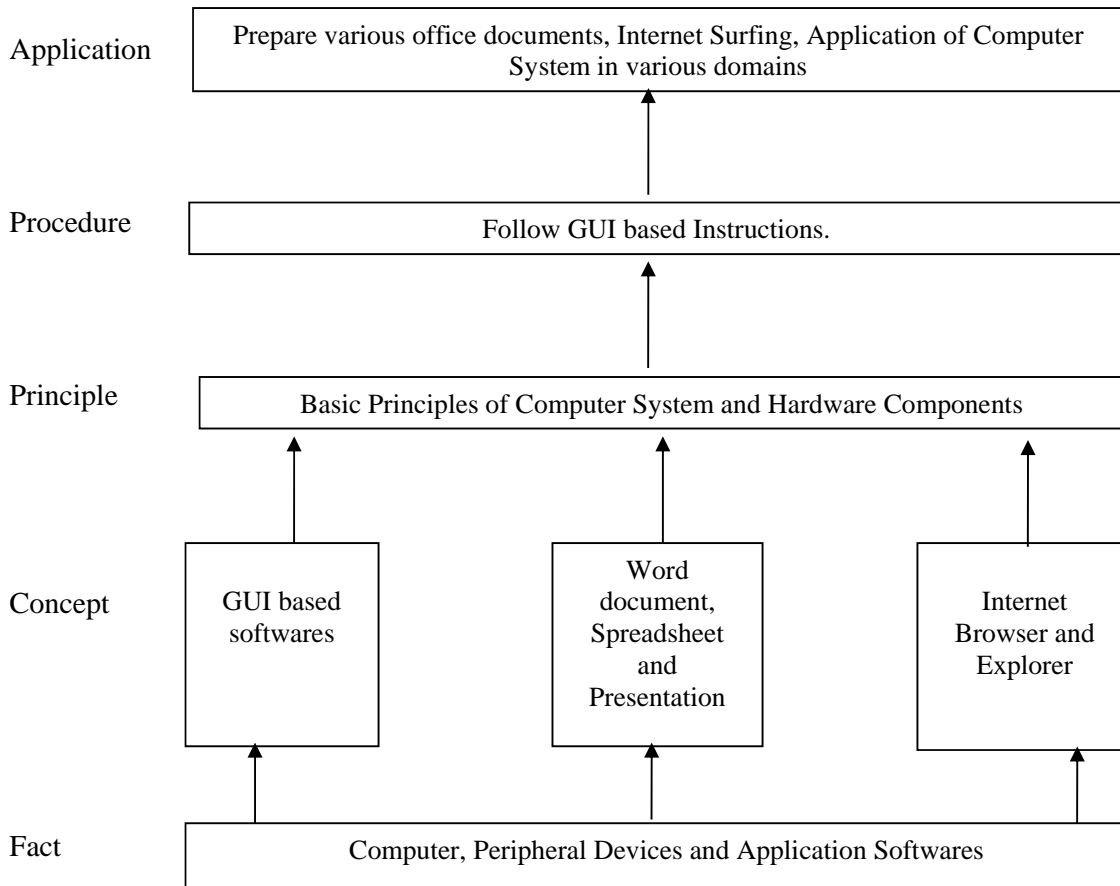
Intellectual Skills:

Students should be able to:

1. Use of Operating System.
2. Use MS- Word, MS-Excel, MS- PowerPoint, efficiently for documentation.
3. Use browser for accessing Internet.

Motor Skills:

       Handle Personal Computer System.

Learning Structure:

Application	Prepare various office documents, Internet Surfing, Application of Computer System in various domains

↑

Procedure	Follow GUI based Instructions.

↑

Principle	Basic Principles of Computer System and Hardware Components

↑   ↑   ↑

Concept	GUI based softwares	Word document, Spreadsheet and Presentation	Internet Browser and Explorer

↑   ↑   ↑

Fact	Computer, Peripheral Devices and Application Softwares

Contents:

Note:
1. It is suggested that the separate batch should be formed for students having less computer background.
2. Contents of theory are to be taught in practical period with the help of LCD projector.

Sr. No	Activity/Topics	Hours
1	• **Algorithms**-Introduction, Three Basic Operations, Procedures and Programs	1
2	• **Data Representation-** Representing different symbols, minimizing errors, Representing more Symbols, Generic Formula, the ASCII code, the EBCDIC code, Rules of Decimal number System and its conversion to binary • **Multimedia-** Digital images, analog to digital conversions, digital audio and digital video	2
3	• **Binary Arithmetic-** binary addition, binary subtraction, multiplication and division • **Logic Gates**- The need for derived gates, Half adder, Full adder, Logical operations	2
4	• **Data Storage- memory-**Main Memory, Memory data transfer, MBR, Memory decoders -1x2,2x4…10x1024, MAR, Address, Data and Control Buses, Load and Store Instructions, Word and Word Length, RAM and ROM, Cache Memory • **Data Storage- Disk-** Memory Hierarchy, Disk basics – Cylinders, Tracks, Surfaces, Sectors, Relationship between logical and physical records, Disk Controller Architecture, Sector format, Formatting Process, Seek Time, Rotational Delay and Transmission time, The relationship between Application program, Operating System, Disk Controller and the actual disk, CDs, DVD • **VDU and Printers-**Human-computer interface, Keyboard, Raster Scanning, Frame Buffer, Basics of Graphics, Black and White/ Color Terminals, Text based terminals, LEDs/LCDs, Inkjet Printers, Laser Printer	3
5	• **Computer Architecture-**CPU Registers, Multiplexers, ALU, Instruction Format, Instruction Decoding, Instruction Execution Cycles • **Operating System-**Concepts of system calls, Multiprogramming, Concepts of Context Switch, Different Services of Operating System, Information Management , Process Management (Process states, Process State Transition, Process Scheduling), Memory Management (Fixed Partition, Variable Partition, Paging, Demand Paging)	2
6	• **Classification of Computers and applications**- Characteristics of Computers, What Computers can do, What computers can't do, Classification of Digital Computer Systems, Anatomy of a Digital Computer	1
7	• **Introduction to Computer** Usage of computer system in different domains like office, book publication, ticket reservation, banks etc. Components of PC – Mouse, keyboard, CPU, monitor, printers, scanners, modem, memory, sound cards, pen drives.	1

8	• **Introduction to Operating System(Windows 7)** Working with Windows desktop, icons, taskbar, menu bar options, My Documents, My Computer, Control Panel, Recycle bin Concept of drives, folders, files Windows accessories – Notepad, WordPad, paint, clock, calendar, calculator	1
9	• **GUI Based Software – MS – Office 2010** MS-Word – Opening menus, toolbars, opening and closing documents, clipboard concept MS – Excel – Working and manipulating data with excel, formulas, functions, chart and its types MS – PowerPoint – Working with PowerPoint and presentation ,Changing layout, Graphs , Auto content wizard ,Slide show, Animation effects, Normal, outline, Slide sorter, Reading view.	2
10	• **Internet** History of Internet, equipments required for Internet connection, browser (Internet Explorer, Mozilla and Firefox, Google Chrome)	1
	Total	**16**

List of Practicals / Activities

Sr. No	Practicals / Activities
1	• Demonstration of above peripheral devices to students
2	• Moving from one window to another window • Opening task bar buttons into a window. • Arranging icons on the desktop and create shortcuts.
3	• Creating folders and files. • Copy, rename, delete files and folders. • Moving folders and files from one drive to another drive.
4	• Create and edit notepad document. • Create and edit WordPad document. • Create paint file by using different drawing tools.
5	• Creating, editing, saving word document. • Entering and formatting text. • Paragraph formatting, use bullets and numbering. • Page formatting – page margins, page size, orientation, page break, headers and footers. • Create tables, insert, and delete rows and columns. • Printer installation and printing document. • Create and print mail merging address for envelop and letters.
6	• Create, open and print worksheet with page setup and print options. • Enter data and format cells. • Select, insert, delete cells, rows and columns. • Insert formulas, functions and named ranges in worksheet. • Create chart of different types.
7	• Create a simple text slide using formatting, Selecting a slide layout. And insert pictures & backgrounds. • Insert auto shapes, clip-arts and form group/un group objects from slides. Apply slide transitions and slide timings and animation effect for slide show
8	• Perform Internet connection.

	• Create own e-mail id, send and receive mail with attachment. • Searching information using search engine (Google, MSN, bing etc.) • Do Internet chatting and understand the chat toolbar. • Organize favorite websites in different browsers.

Learning Resources:
1. Books:

Sr. No	Author	Title	Publisher
1	Achyut Godbole	Demystifying Computer	TMH
2	Alexis Leon	Introduction to Computers	Vikas Publishing House
3	Vikas Gupta	Comdex Computer Course Kit (Windows 7 with Office 2010)	Dreamtech Press
4	Steve Schwartz	Microsoft Office 2010	Pearson
5	Elaine Marmel	Microsoft Project 2010 (Bible)	Wiley India
6	Preppernau Cox	Windows 7 Step by Step	PHI

2. Links:
1. http://www.psexam.com
2. http://www.gcflearnfree.org/office
3. http://www.softwaretrainingtutorials.com/ms-project-2010.php
4. http://www.7tutorials.com

List of Equipments/Tool:

Hardware Tools-
1. Computer System (Pentium –IV or higher version)
2. Printer
3. Modem
4. Pen Drive

Software Tools-
1. Windows- 7 (Operating System)
2. MS-Office 2010
3. MS- Project 2010
4. Internet Explorer/Mozilla/Chrome/Firefox

Guidelines for Online Exam:
1. Total duration for online examination is an hour.
2. There will be theoretical multiple choice questions.
3. There will be certain practical performance based questions.

Course Name : All Branches of Diploma in Engineering and Technology

Course Code : AE/CE/CH/CM/CO/CR/CS/CW/DE/EE/EP/IF/EJ/EN/ET/EV/EX/IC/IE/IS/

ME/MU/PG/PT/PS/CD/CV/ED/EI/FE/IU/MH/MI/DC/TC/TX/AU

Semester   : Second

Subject Title   : Development of Life Skills

Subject Code : 17010

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
01	--	02	--	--	--	25@	--	25

Rationale:

Globalization has emphasized the need for overall development of technician to survive in modern era. Soft skills development in addition to technical knowledge; plays a key role in enhancing his/her employability.

This subject aims to provide insights into various facets of developing ones personality in terms of capabilities, strengths, weakness, etc as well as to improve reading, listening and presentation skills. Also in this age fierce competition, the time and stress management techniques will immensely help the technician to live happy and purposeful life.

General Objectives:

After studying this subject, the students will be able to:

1. Understand and appreciate importance of life skills.
2. Use self-analysis and apply techniques to develop personality.
3. Use different search techniques for gathering information and working effectively.
4. Improve the presentation skills.

Learning Structure:

Application	• Self-development and growth • Performing tasks effectively by implementing soft skills • Goal achievements and result oriented work

↑ ↑

Procedure	• Preparing slides / transparencies • Reading, writing, notes taking	• Doing exercise • Managing time

↑ ↑

Principle	• Self analysis • Time management	• SWOT analysis • Stress management

↑ ↑

Concept	• Presentation • Study • Time	• Personality • Attitude • Stress

↑ ↑

Facts	• Work place as a system • Information	• Smart engineer • Task or Goal

Theory:

Topic and Contents	Hours

TOPIC 1: Self Analyisis
Specific Objectives:
   ➢ To introduce oneself.
Contents:
   1.1 Need of Self Analysis
   1.2 Attitude and types (positive, negative, optimistic and pessimistic)
   Guidelines for developing positive attitude.
	02

TOPIC 2: Study Techniques
Specific Objectives:
   ➢ To identify different process and strategies.
   ➢ To improve reading, listening and notes taking skills.
Contents:
   2.1 Learning strategies
   2.2 Learning process
   2.3 Organization of knowledge
   2.4 Reading skills
   2.5 Listening skills
   2.6 Notes taking
   2.7 Enhancing memory
	03

TOPIC 3: INFORMATION SEARCH
Specific Objectives:
   ➢ To search information as per the need.
Contents:
   3.1 Sources of information
   3.2 Techniques of information search (library, internet, etc)
	02

TOPIC 4: Self Development
Specific Objectives:
   ➢ To set primary goals using SMART parameters.
   ➢ To Priorities the work effectively.
   ➢ To cope up with stress effectively.
Contents:
   4.1 Goal setting and its importance.
   4.2 Characteristics of Goal setting (**SMART**- **S**pecific, **M**easurable, **A**ttainable, **R**ealistic, **T**ime bound)
   4.3 Time Management - Importance, prioritization of work, time matrix, time savers, and time wasters.
   4.4 Stress Management - Definition, types of stress, causes of stress, managing stress, and stress busters.
	06

TOPIC 5: Presentation Techniques
Specific Objectives:
   ➢ To plan for presentation.
   ➢ To prepare contents for presentation.
	03

Contents:	
5.1 Importance of presentation.	
5.2 Components of effective presentation (Body language, voice culture , rehearsal, etc)	
5.3 Preparing for presentation.	
5.4 Use of audio/video aids. (audio, video, transparency's, PowerPoint presentations, etc)	
5.5 Performing presentation (Seminars, paper presentations, compering, etc)	
Total	**16**

Practical:
Skills to be developed:

Intellectual Skills:

Student will be able to

- Develop ability to find his capabilities.

- Select proper source of information.

- Follow the technique of time and stress management.

- Set the goal.

Motor Skills:

Student will be able to

- Follow the presentation of body language.

- Work on internet and search for information.

- Prepare slides / transparencies for presentation.

List of Practicals/activities:

1. Giving self introduction. Observe the demonstration of self introduction given by the teacher and prepare a write up on the following points and introduce yourself in front of your batch in 5 minutes

   ➢ Name

   ➢ Native place

   ➢ Background of school from where he / she passed

   ➢ Family background

   ➢ Hobbies / salient achievements / idols if any for self development

   ➢ Aims of life as an Engineer

2. Provide responses to the questions based on the moral story given in the assignment.

3. Judge your attitude by responding to the tests given in the assignment and write comments on your score.

4. Read any chapter from the subject of Engineering Physics / Engineering Chemistry and identify facts, concepts, principles, procedures, and application from that chapter

5. Participate in the panel discussion on techniques of effective learning and provide the responses to the questions.

6. Access the book on Biography of Scientists/Industrialist/Social leader/Sports Person from library. Read the book and note the name of author, publication, year of publication, and summarize the highlights of the book.

7. Prepare notes on given topic by referring to books / journals / websites.

8. Prepare 8 to 10 power point slides based on the notes prepared on the above topic. Present the contents for 10 minutes Group wise(Group will be of 4 students)

Note – Subject teacher shall guide the students in completing the assignments based on above practical.

Learning Resources:
Books:

Sr. No.	Author	Name of Book	Publication
1	Richard Hale and Peter Whitlam	Target setting and goal achievement	Kogan Page
2	Andrew Bradbury	Successful Presentation Skills	The Sunday Times – Kogan
3	Ros Jay and Antony Jay	Effective Presentation	Pearson – Prentice Hall
4	Subject Experts - MSBTE	Handbook on Development of Life Skills	MSBTE
5	Nitin Bhatnagar and Mamta Bhatnagar	Effective Communication and Soft Skills	Pearson
6	D. Sudha Rani	Business Communication and Soft Skills	Pearson
7	Barak K Mitra	Personality Development and Soft Skills	Oxford University Press
8	Dr. T. Kalayani Chakravarti and Dr. Latha Chakravarti	Soft Skills for Managers	Biztantra

Course Name   : **Diploma in Textile Technology**

Course Code   : **TC**

Semester   : **Second Semester for TC and Third Semester for TX**

Subject Title   : **Elements of Electrical Engineering and Mechanics**

Subject Code   : **17015**

Teaching & Examination Scheme:

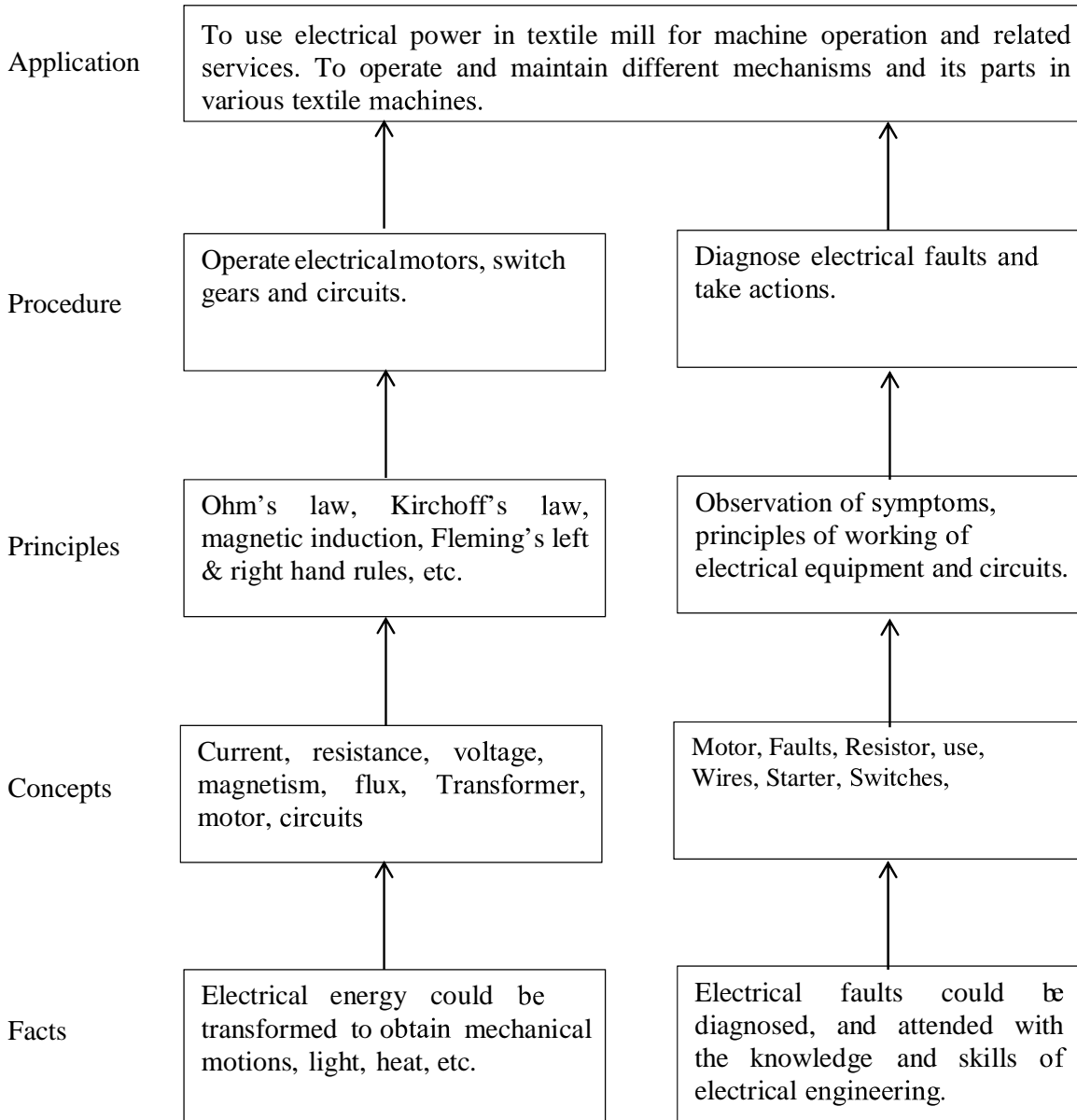| Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS.	TH	PR	OR	TW	TOTAL
--	--	02	--	--	--	--	25@	25

Rationale:

The prime responsibility of a textile technician working on shop floor is to ensure smooth and continuous functioning of all the machines and equipment for satisfactory production and quality. This requires him to maintain the machines always in good condition and to ensure that the functioning of all mechanisms in a particular machine is in a correct manner. This kind of abilities and competencies could be developed with the basic knowledge of force, work, energy, and power used for working of the machine. These basic concepts help to develop principles of motion and their transformation, and the methods of maintenance, which could be used to achieve the targets of production and quality.

Secondly, the electrical power is one of the most essential inputs of any textile mill. We are also aware that not only the textile machinery is powered through electrical energy, but other services like, air conditioning, ventilation, water supply, lighting, etc. also are powered by electrical energy. It is also evident that lot of care is needed in use of electrical power due to cost and safety. This requires the knowledge of basic electrical concepts like voltage, current, power etc. Further, technician should know about the different types of motors, their working, billing of the electrical energy, and the safety measures while working with electrical equipment. This subject intends to impart the knowledge and skills of these aspects in the first part of the subject.

With these objectives, the subject has been created to impart knowledge about mechanics and materials. This subject thereby has been divided in to two parts.
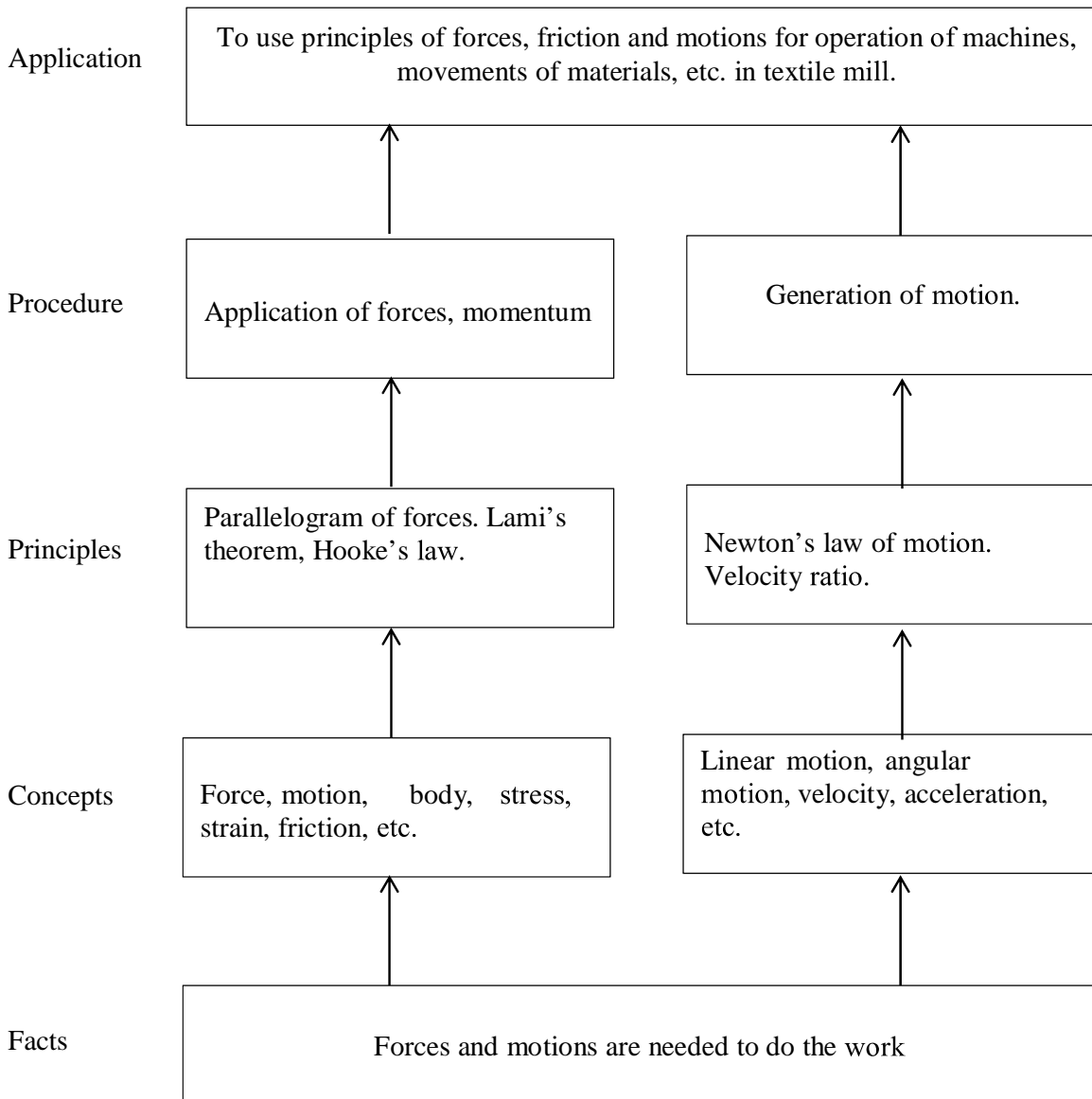
ELEMENTS OF ELECTRICAL ENGINEERING:

Learning Structure for Electrical Engineering:

Application	To use electrical power in textile mill for machine operation and related services. To operate and maintain different mechanisms and its parts in various textile machines.	
Procedure	Operate electrical motors, switch gears and circuits.	Diagnose electrical faults and take actions.
Principles	Ohm's law, Kirchoff's law, magnetic induction, Fleming's left & right hand rules, etc.	Observation of symptoms, principles of working of electrical equipment and circuits.
Concepts	Current, resistance, voltage, magnetism, flux, Transformer, motor, circuits	Motor, Faults, Resistor, use, Wires, Starter, Switches,
Facts	Electrical energy could be transformed to obtain mechanical motions, light, heat, etc.	Electrical faults could be diagnosed, and attended with the knowledge and skills of electrical engineering.

ELEMENTS OF MECHANICS:

Learning Structure for Elements of Mechanics:

Application	To use principles of forces, friction and motions for operation of machines, movements of materials, etc. in textile mill.
Procedure	Application of forces, momentum	Generation of motion.
Principles	Parallelogram of forces. Lami's theorem, Hooke's law.	Newton's law of motion. Velocity ratio.
Concepts	Force, motion, body, stress, strain, friction, etc.	Linear motion, angular motion, velocity, acceleration, etc.
Facts	Forces and motions are needed to do the work

Practical:

ELEMENTS OF ELECTRICAL ENGINEERING: Skills to be developed:

Intellectual Skills:

1. To understand use of ohm's law and Kirchhoff's law.

2. To determine Power factor in R, L circuit.

3. To understand working of electrical and magnetic circuits and induced current.

4. To understand A.C.

5. To understand principle of transformer.

6. To understand induction motors and its construction and operation, speed control.

7. To understand faults in motors to solve simple problems.

8. To understand tariff and other related terms.

Motor Skills:

1. To measure current voltage its direction.

2. Three phase wiring circuit textiles.

List of Practical:

1. Verification of Ohm's law and Kirchhoff's law.

2. Determination of Power Factor of R-L Series circuit.

3. Performance of single phase Transformer by direct loading.

4. Draw single line diagram of three-phase wiring for any section/department of a textile mill comprising of motors.

5. Study of operation of DOL and star-delta starter.

6. Performance of three phase induction motor by direct loading.

ELEMENTS OF MECHANICS:
Skills to be developed:

Intellectual skills:

Determine law of machine, frictional efforts, efficiency of machine

Motor Skills:

Apply load on the machine and measure the corresponding effort required to determine the relation between load and effort and determine velocity ratio

List of Practical:

1. Verification of law of polygon of forces.

2. Find out velocity ratio, mechanical advantage and efficiency of wheel and differential axle

3. Find out velocity ratio, mechanical advantage and efficiency of worm and worm wheel arrangement.

4. Find out velocity ratio, mechanical advantage and efficiency of single purchase crab and double purchase crab.

5. Find out velocity ratio, mechanical advantage and efficiency of screw jack

6. Determine coefficient of friction between different surfaces like metal, wood, glass etc

7. Study of different type of drives & their Applications in textile machines.

Learning Resources:
Books:

- Electrical Technology Vol. I to IV   - B.L.Theraja
- Electrical circuits   - Timothy Maloney
- Electrical Technology   - Edward Hughes
- Elements of Electrical Engineering   - U.A. Bakshi
- Textile Mechanics   - Hanton
- Textile Mathematics   - J.E.Booth
- Theory of Machines   - Khurmi
- Textile Mechanic Vol I & II   - Slator