

**DKTE Society's
TEXTILE & ENGINEERING INSTITUTE
Rajwada, Ichalkaranji 416115
(An Autonomous Institute)**

DEPARTMENT: TEXTILES

**CURRICULUM
B. Tech. Textile Technology Program**

First Year
With Effect From
2017-18



**First Year B. Tech Textile Technology
Semester-I**

Sr. No.	Course Code	Name of the Course	Group	Teaching Scheme				Credits
				Theory Hrs/ Week	Drawing Hrs/ Week	Practical Hrs/ Week	Total	
1	TTL131	APPLIED PHYSICS	A	3			3	3
2	TTL132	TEXTILE MATHEMATICS-I	A	3			3	3
3	TTL133	ENGINEERING GRAPHICS	B	2			2	2
4	TTL134	TEXTILE FIBRES	D	3			3	3
5	TTL135	YARN FORMING TECHNOLOGY-I	D	3			3	3
6	TTL136	FABRIC FORMING TECHNOLOGY-I	D	3			3	3
7	TTP137	ENGINEERING GRAPHICS LAB	B			3	3	1.5
8	TTP138	YARN FORMING TECHNOLOGY-I LAB	D			3	3	1.5
9	TTP139	FABRIC FORMING TECHNOLOGY-I LAB	D			3	3	1.5
10	TTP140	FUNDAMENTALS OF COMPUTER AND PROGRAMMING LAB	B			3	3	1.5
Total				17	0	12	29	23

Group Details

- A: Basic Science
 B: Engineering Science
 C: Humanities, Social Science & Management
 D: Professional Core Courses & Professional Elective
 E: Free Elective
 F: Seminar/Training/ Project

First Year B. Tech. Textile Technology - Semester I

TTL131: APPLIED PHYSICS

Teaching Scheme	
Lectures	3 Hrs/ Week
Credits	3

Evaluation Scheme	
SE-I	25
SE-II	25
SEE	50
Total	100

Course Objectives

1. Understand significance of basic concepts of physics involved in textiles
2. Discuss the different factors from physics affecting yarn and fabric properties
3. Explain the different principles from physics involved in textiles.
4. Explain the different methods of measurement and calculate the different quantities of physics involved in textiles.

Course Outcomes

At the end of the course students will be able to

1. Understand significance of basic concepts of physics involved in textiles
2. Discuss the different factors from physics affecting yarn and fabric properties
3. Explain the different principles from physics involved in textiles.
4. Explain the different methods of measurement and calculate the different quantities of physics involved in textiles.

Course Contents

	Hrs.
Unit 1. Elasticity: Stress, strain, Hooke's Law of elasticity. Some peculiar traits, working stress and factor of safety. Factors affecting elasticity. Young's modulus, bulk Modulus and Modulus of rigidity. Relation between Y , η and K . Poission's ratio, relation between K , η and Poission's ratio.	8
Unit 2. Friction and Viscosity: Newton's Law of viscosity, streamline & turbulent flow, critical velocity, significance of Reynold's number. Experimental determination of η for a liquid by Poiseuille's method, Stokes law. Terminal velocity and its expression. Ostawald viscometer Applications of viscosity.	8
Unit 3. Surface Tension: Molecular theory of surface tension. Angle of contact and its characteristics. Excess pressure inside a liquid drop & soap bubble. Relation between radii of curvature, pressure & surface tension. Applications	7

of surface tension.

- Unit 4. Optics:** Laws of refraction, refractive index, total internal reflection. **6**
Magnifying power of simple and compound Microscope. Construction & working of electron microscope. Double refraction, Nicol prism. Quarter & half wave plates.
- Unit 5. Photoelectric Effect:** Concept, Einstein's equation of photoelectric effect. **5**
Factors affecting the photoelectric effect. Study of various photocells. Use of photo sensors.
- Unit 6. Crystallography:** Lattice, Basis, Crystal structure, seven crystal systems. **5**
Production of x-rays, Bragg's law, Bragg's x-ray spectrometer.

Reference Books

- 1 Elements of Properties of Matter by D.S. Mathur
- 2 Engineering Physics by B.L. Theraja
- 3 Engineering Physics by R.K. Gour & Gupta
- 4 Physics for Engineers by M.R. Srinivasan
- 5 Text Book of Optics by Brijlal & Subramanyam
- 6 Optics by A.K. Ghatak

First Year B. Tech. Textile Technology- Semester I

TTL132: TEXTILE MATHEMATICS-I

Teaching Scheme		Evaluation Scheme	
Lectures	3 Hrs. /Week	SE-I	25
Credits	3	SE-II	25
		SEE	50
		Total	100

Course Objectives

1. Introduce students to mathematical methods which suits to solve the problems of matrices.
2. Prepare students so that they can understand mathematical treatments used in tracing the curves and the rules of differentiation & partial differentiation.
3. Introduce students to statistical methods which suits to statistical applications needs of Textile Math's III & IV of textile engineering.
4. Develop ability to collect, formulate & analyse textile testing data.

Course Outcomes

At the end of the course students will be able to

1. Solve problems related to matrices, successive differentiation, partial differentiation and its application
2. Solve the problems of successive differentiation, partial differentiation and its application
3. Collect textile testing data & classify and represent graphically also evaluate and interpret measures of central tendency and dispersion.
4. Evaluate and interpret measures of skewness and kurtosis understand mathematical models used in textile engineering

Course Contents

- Unit 1. Matrix:** Rank of matrix (Normal form of matrix, Echelon form of Matrix) Solution of simultaneous linear equations (Homogeneous & Non Homogeneous) Characteristic equation, eigen values, eigen vectors. Caley Hamilton's theorem. **7 Hrs.**
- Unit 2. Successive Differentiation & Partial Differentiation:** **7 Hrs.**
Introduction, standard results, Leibnitz rule. Introduction of p. d., total differentiation, Euler's theorem on homogeneous function.

	Jacobean ($J.J'=1$) only, Errors & approximation.	
Unit 3.	Curve Tracing: Rules & examples of curve tracing in Cartesian and Polar Equations only.	5 Hrs.
Unit 4.	Introduction of Statistics: Definitions of Population, Variable, Attribute, Census Survey, Sample Survey, Random sample. Raw statistical data, collection, classification, Frequency distribution, class limits & boundary, class width, mid-point. Histogram, Frequency polygon, Frequency curve. Measures of central tendency: Arithmetic Mean (A.M.), Median, Mode, Combined Mean & Computation Partition values : Quartiles deciles and percentiles & Computation	7 Hrs.
Unit 5.	Measures of dispersion: Range, Quartile deviation, Mean deviation, Standard deviation as Absolute measures of dispersion, Coefficient of range, quartile deviation, mean deviation, coefficient of variation as Relative measures of dispersion, consistency of data & computation	7 Hrs.
Unit 6.	Measures of Skewness & kurtosis: Skewness, types, Karl Pearson's & Bow ley's coefficient of skewness & Computation. Kurtosis definition and types only. (No Examples of Kurtosis)	6 Hrs.

Reference Books

1. A textbook of applied mathematics Vol.-I & II by P.N. & J.N. Wartikar.
2. Higher engineering mathematics by B.S. Grewal
3. A textbook of applied mathematics by Bali, Saxena&Iyengar.
4. Mathematical Statistics by J.E. Freund.
5. Probability & Statistics for engineers by Johnson.
6. Statistical methods by Kumbhojkar

First Year B. Tech. Textile Technology - Semester I

TTL133: ENGINEERING GRAPHICS

Teaching Scheme		Evaluation Scheme	
Lectures	2 Hrs. /Week	SE-I	25
Credits	2	SE-II	25
		SEE	50
		Total	100

Course Objectives

1. To understand procedure for converting a pictorial view into orthographic view.
2. To understand procedure for converting an orthographic view in to isometric view.
3. To understand procedure for drawing Development and anti-development of solids such as cone, cylinder, prism and pyramid.
4. To study IS convections for various materials and mechanical elements, free hand sketches of various mechanisms used in textile machines. To know the use of Auto-CAD Commands.

Course Outcomes

At the end of the course students will be able to,

1. Draw orthographic views from a given pictorial view.
2. Draw isometric view from given orthographic views.
3. Draw Development and anti-development of solids such as cone, cylinder, prism and pyramid.
4. Draw IS convections for various materials and mechanical elements, free hand sketches of various mechanisms used in textile machines. To write Commands for various entities in Auto-CAD.

	Course Contents	Hrs.
Unit 1.	Introduction & use of instruments: Line, Lettering, Conventions of section lines, I.S. conventions of machine parts like knurling, square end of shaft, bearing, springs, external & internal thread.	3
Unit 2.	Orthographic Projections: General principles, First angle method, Third angle method, Dimensioning.	3

Unit 3.	Sectional Orthographic views: Cutting plane, Types of sections, drawing sectional views of machine components.	5
Unit 4.	Isometric Projections: Principle, Isometric scale, Isometric views, Making Isometric drawings of simple objects from orthographic views.	6
Unit 5.	Development of Surfaces: Introduction to solids (Types of solids only), Development of lateral surfaces of cubes, prisms, pyramids, cylinders & cones.	6
Unit 6.	Free hand sketches & Introduction to Auto- CAD Making free hand sketches of various textile machine parts & mechanisms used in spinning, weaving, processing, garments & Commands for drawing lines, circles, polygons, ellipse etc.	3

Reference Books

1. Engineering Drawing by N. D. Bhatt & V. M. Panchal.
2. Engineering Drawing by Venugopal.
3. Machine Drawing by N. D. Bhatt & V. M. Panchal.
4. Machine Drawing by K. L. Narayana, Kannaiah P., K. Venkata Reddy.
5. Principles of Weaving by Marks & Robinson.
6. Engineering Graphics by H. G. Phakatkar

First Year B. Tech. Textile Technology - Semester I

TTL134: TEXTILE FIBRES

Teaching Scheme		Evaluation Scheme	
Lectures	3 Hrs. /Week	SE-I	25
Credits	3	SE-II	25
		SEE	50
		Total	100

Course Objectives

1. To explain basics of textile fibres.
2. To describe morphological and chemical structure of natural fibres.
3. To describe manufacturing processes of manmade fibres.
4. To explain properties of natural and manmade fibres.

Course Outcomes

At the end of the course students will be able to

1. Explain the basics of textile fibres.
2. Describe morphological and chemical structure of natural fibres.
3. Demonstrate manufacturing processes of manmade fibres
4. Enunciate properties of natural and manmade fibres.

Course Contents

	Hrs.
Unit 1. Introduction: Definition of fibre, Staple fibre, Filament, Classification of fibres, Essential and desirable properties of textile fibres, Concepts of molecular weight, Degree of polymerization, Orientation and Crystallinity, Characteristics of fibre forming polymer, Advantages and disadvantages of natural & manmade fibres.	5 Hrs
Unit 2. Natural fibres: Vegetable Fibres	7 Hrs
i. Cotton fibre - Cultivation and harvesting, Development of fibre in seed, Morphological structure, Properties and applications of Cotton fibre.	
ii. Bast fibres - Retting and extraction process of Bast fibres, Properties and applications of Jute fibres.	
Unit 3. Animal Fibres:	7 Hrs
i. Wool - Grading of wool, Morphological structure, Properties and applications.	
ii. Silk - Types of silk, Production of silk, Morphological structure,	

	Properties and applications.	
Unit 4.	Man Made fibres:	4 Hrs
	Introduction to methods of fibre formation - Melt spinning, Dry spinning and Wet spinning, Comparison between different man-made fibre formation technologies.	
Unit 5.	Synthetic fibres:	13 Hrs
	i. Polyamide: Nylon 6 & Nylon 66 fibres - Manufacturing process, Properties and applications.	
	ii. Polyester (Polyethylene Terephthalate) - Manufacturing process, Properties and applications.	
	iii. Polypropylene - Manufacturing process, Properties and applications.	
	iv. Polyacrylonitrile Fibre- Manufacturing process, Properties and applications.	
	v. Polyurethane Fibre –Extensibility and recovery mechanism, Manufacturing process, Properties and applications.	
Unit 6.	Regenerated Fibres:	3 Hrs
	Viscose rayon: Manufacturing process, Properties and applications.	

Reference Books

1. Textile Fibres - Vol. - I by V .A. Shenai, Sevak Publications, Bombay, 1971.
2. Textile Fibres - H V S Murthy, Textile Association Publication, 1995.
3. A Text book of Fibre Science And Technology by S.P. Mishra, New age international (p) Limited, 2000.
4. Hand book of Textile Fibres Vol. I & II by Gorden & Cook, Merrrow Publication Ltd, England.
5. Man Made Fibres - R.W. Moncrieff, Heywood Books, London, 1998.
6. Polymer science - V. Govariker, Wiley Eastern Ltd, New Delhi, 1990.

First Year B. Tech. Textile Technology - Semester I

TTL135: YARN FORMING TECHNOLOGY-I

Teaching Scheme		Evaluation Scheme	
Lectures	3 Hrs. /Week	SE-I	25
Credits	3	SE-II	25
		SEE	50
		Total	100

Course Objectives

1. To explain basic fibre properties and staple yarn spinning processes
2. To explain working principles of ginning and blow room technology.
3. To describe constructional details and design aspects of machine parts and mechanisms involved in Ginning and Blow-room.
4. Explanation of process parameters and related calculations of Blow-room.

Course Outcomes

At the end of the course students will be able to

1. Understand fibre properties, operations and mechanisms of staple yarn spinning
2. Understand processes and methods used for cotton cultivation
3. Understand cotton Ginning technology and Techniques
4. Understand the Blow Room technology

Course Contents

Unit 1.	Definition of terms – ‘Textiles’, ‘Fibres’, ‘Yarns’ and ‘Fabric’, process flow chart for carded & combed yarn manufacturing. Essential and desirable properties of fibres.	5 Hrs.
Unit 2.	Yarn numbering systems and related calculations	5 Hrs.
Unit 3.	Indian Cotton Cultivation and Cotton Harvesting.	3 Hrs.
Unit 4.	Introduction of ginning process, Types of Ginning machines.	6 Hrs.
Unit 5.	Pre and post ginning machines used and their objects. Factors affecting ginning performance Pressing and bailing of Indian cotton and bale dimensions.	6 Hrs.
Unit 6.	Object of blow room machines, Opening and cleaning principles of blow room. Various components of blow room machines, Different zones in	14 Hrs.

blow room, Conventional blow room machines. Modern blow room machines

Automatic bale opener

Mild openers – Maxi-flow/ Uni-clean

Mixing Machine – Multimixer

Intensive openers – ERM /CVT

Dust removal and Contamination removal.

Blow Room Accessories – Smoke Detector, Metal Detector

Reference Books

1. The Textile Institute Publication - Manual of Textile Technology – Short Staple Spinning Series by W. Klein
2. The Characteristics of Raw Cotton’ by P. Lord. The Textile Institute Publication, Manual of Cotton Spinning Vol. II, Part-I.
3. ‘Opening and Cleaning’ by Shirley. The Textile Institute Publication, Manual of Cotton Spinning Vol. II, Part-II.
4. Opening Cleaning and Picking’ by Dr.Zoltan S. Szaloki, Institute of Textile Technology, Virginia.
5. ‘Cotton Ginning’ Textile Progress, The Textile Institute Publication.
6. Blow room and Carding- Training Program conducted by NCUTE, IIT, Delhi.
7. Essential calculations of practical cotton spinning by T.K. Pattabhiraman
8. The Textile Institute Publication - Manual of Textile Technology – Short Staple Spinning Series by W. Klein

First Year B. Tech. Textile Technology - Semester I

TTL136: FABRIC FORMING TECHNOLOGY-I

Teaching Scheme	
Lectures	3Hrs. /Week
Credits	3

Evaluation Scheme	
SE-I	25
SE-II	25
SEE	50
Total	100

Course Objectives

1. To describe the Textile Industry in India and explain the object of all weaving preparatory processes
2. To explain need, manufacturing technology of ordinary winding process and pirn winding process.
3. To explain various motions of a plain loom, production and fabric weight calculations
4. To explain method of fabric analysis and also to describe the identification and construction of basic weaves

Course Outcomes

At the end of the course students will be able to

1. Understand nature of textile Industry in India and explain the object of all weaving preparatory processes
2. Understand need manufacturing technology of ordinary winding and pirn winding process
3. Understand various motions of a plain loom, production and fabric weight calculations
4. Understand method of fabric analysis and also to describe the identification and construction of basic weaves

Course Contents

Unit 1. Introduction

Hrs.

06

1. Nature of textile industry in India
2. Various methods of fabric forming: - Weaving, knitting, braiding, non-woven, brief description of all methods, processes involved in it and their applications.
3. Weaving processes: objects of all processes. Different kinds of fabrics: Grey, mono-colour, multi-colour, warp or weft stripes, checks.
4. Process flow charts for various fabrics

Unit 2.	Ordinary winding	08
	<ol style="list-style-type: none">1. Need: - Limitation of ring spinning to make big packages and good yarn, objects of winding process2. Machines: - Types of winding machine, precision winding, drum winding, merits and demerits.3. Machine Details: - Construction and working of winding machine, yarn path, details of machine zones such as creel, knotting, clearing, winding, functions and details of important accessories such as tensioners, yarn clearers, cradle weighting, drum drive, types of packages produced.4. Yarn Joining methods (Splicing and knotting principles)5. Concepts of - Cone angle, angle of wind, wind per double traverse.	
Unit 3.	Pirn winding	03
	<ol style="list-style-type: none">1. Objectives: - rewound weft, its advantage, need2. Details of pirn winding machines w. r. t drive to spindles, traverse, tensioning yarn path.3. Pirn build: - length of wind, chase length, diameter, bunch, tail ends etc. their importance during weaving process.	
Unit 4.	Fabric Forming	12
	<ol style="list-style-type: none">1. Outline of weaving mechanisms: - Classification of weaving machines, Basic motions, primary, secondary and auxiliary, objects,2. Primary motions: Detailed study of -shedding, picking, and beat-up3. Secondary motions: Detailed study of take up and negative let-off.4. Auxiliary motions: - Detailed study of weft fork, anti-crack, oscillating backrest, warp-protecting motions and temples.	
Unit 5.	Fabric structure	6
	<ol style="list-style-type: none">1. Constructional details: - Warp and weft count, thread densities, width, length, selvedge; light, medium, & heavy constructions, warp and weft cover, cloth cover, crimp, contraction in warp and weft way during weaving, introduction to interlacement of thread.	

2. Presentation of weaves: - Design, draft & its types, peg plan, need and importance.
3. Study of weaves: - plain, twill and satin (basic weaves)

Unit 6. Calculations

4

1. Ordinary winding: Winding speed, production/spindle & per machine, and efficiency.
2. Pirn Winding : Average pirn diameter, winding speed, production / spindle / & per machine, efficiency
3. Fabric Forming: Warp weight, weft weight, fabric weight per sq.m, fabric production/loom.

Reference Books

1. Principles of weaving By Marks A.T.C. & Robinson.
2. Textile Colour and Design By Watson.
3. Weaving By Prof. D. B. Ajgaonkar, Prof. Sriramalu & Prof. M. K. Talukdar.
4. Weaving Mechanism by K.T. Aswani.
5. Winding &Warping by Talukdar M.K.
6. Yarn Preparation- Vol. - I by Sengupta.
7. Weaving Calculation by Sengupta.
8. Textile Mathematics-Vol. I by J.E. Booth.
9. Fibre to Fabric by P.R. Lord

First Year B. Tech. Textile Technology - Semester I**TTP137: ENGINEERING GRAPHICS LAB**

Teaching Scheme		Evaluation Scheme	
Drawing Practical	2 Hrs. /Week	CIE	50
Credits	1.5	Total	50

List of Experiments

1. Lines, Letterings & Dimensioning.
2. Conventions of section lines & I.S. conventions of machine parts.
3. Conversion of pictorial view into orthographic views.
4. Conversion of pictorial view into sectional orthographic views.
5. Free hand sketches of textile machine parts & mechanisms.
6. Isometric Projections.
7. Development of Surfaces

Submission

Submission of 8 drawing sheets of half imperial size on the above topics.

First Year B. Tech. Textile Technology - Semester I**TTP138: YARN FORMING TECHNOLOGY I LAB**

Teaching Scheme	
Practical	3 Hrs. /Week
Credits	1.5

Evaluation Scheme	
CIE	50
Total	50

List of Experiments

1. Study of different types of drives and calculations based on the same.
2. Study of various types of bearings used on spinning machines and their lubrication. Application of each type of bearing is demonstrated on machine
3. Introduction to spinning process, sequence, machines (carded/combed).
4. Testing of hank produced from different machines
5. Study of ginning machine: Dimension, Construction, Working, Driving arrangement, calculations
6. Study of Blow-room line - Flow chart - Machine positioning in Blow-room.
7. Study of Bale Opening machine - Dimensions, Driving arrangement, speed calculations.
8. Dimension and driving arrangement study of coarse cleaning machines. Speed calculations.
9. Study of Fine cleaning machine – Dimension, Driving arrangement used, Speed calculations.(ERM)
10. Study of De-dusting machines – Working, Dimension, Driving arrangement and calculations.
11. Overall cleaning efficiency of Blow Room

Submission

1. Completed Journal

First Year B. Tech. Textile Technology - Semester I

TTP139: FABRIC FORMING TECHNOLOGY-I LAB

Teaching Scheme	
Practical	03 Hrs/Week
Total Credits	1.5

Evaluation Scheme	
CIE	50
SEE	--
Total	50

List of Experiments

1. Study of Weaving preparatory and weaving Processes
2. Study of various types of tools and gauges used in weaving
3. Study of loom drive, loom timing, passage of material and primary motions.
4. Study of secondary motions and setting of take up motion
5. Study of auxiliary motions.
6. Study of precision and drum winding machine.
7. Study of weaving accessories and drawing-in
8. Study of pirm winding machine
9. To Study method of fabric analysis
10. Fabric analysis of given fabric sample
11. Fabric analysis of given fabric sample
12. Visit to ordinary weaving machine unit

Submission

1. Completed Journal

First Year B. Tech. Textile Technology - Semester I

TTP140: FUNDAMENTALS OF COMPUTER AND PROGRAMMING LAB

Teaching Scheme	
Practical	3 Hrs. /Week
Credits	1.5

Evaluation Scheme	
CIE	50
Total	50

Course Objectives

1. To describe basic Computer architecture and Generation of computers.
2. To explain operating system concept with its structure and features
3. To illustrate scripting language and programming
4. To explain basic structure of 'C' programming and formation, implementation

Course Outcomes

At the end of the course students will be able to

1. Understand basic of computer architecture and generation of computer.
2. Understand basic of operating system and programming language
3. Design and implement web pages using scripting language.
4. Understand programming concept and develop simple application programs in 'C' language

Experiments will be based on following topics

Unit 1. Introduction to Computers

Introduction: Characteristics of Computers, Block diagram of computer. Types of computers and features, Mini Computers, Micro Computers, Mainframe Computers, Super Computers. Types of Programming Languages (Machine Languages, Assembly Languages, High Level Languages). Data Organization, Drives, Files, Directories. Types of Memory (Primary And Secondary) RAM, ROM, PROM, and EPROM. Secondary Storage Devices (FD, CD, HD, Pen drive) I/O Devices (Scanners, Plotters, LCD, Plasma Display) Number Systems Introduction to Binary, Octal, Hexadecimal number system Conversion, Simple Addition, Subtraction, Multiplication

Unit 2. Computer Software

Operating System: Types of operating system, Functions, Unix/Linux, Windows 7/Windows 8-structures & features, Unix/Linux commands: Listing, changing, copying and moving files & directories (LS, CD, CAT, MKDIR, RMDIR, and other commands), any editor in Linux. Application Software's: Word processor, spreadsheets, presentation, application, DBMS, etc.

Unit 3. Dynamic Web Page Design

HTML: use of commenting, headers, text styling, images, formatting text with, special characters, horizontal rules, line breaks, table, forms, image maps,<META> tags, <FRAMESET> tags, file formats including image formats. Introduction to VB script, basics of VB scripting, Java script.

Unit 4. Programming with ‘C’ Language

Introduction to ‘C’ Programming: Algorithm & flowchart, keywords, statements, Loops, Array representation, one dimensional array, structure, define structure variable, accessing structure member, pointer, pointer arithmetic, pointer & array

Reference Books

1. Fundamentals of Computers by V. Rajaram, PHI Publications.
2. Introduction to Information Technology, IITL Education Solutions LTD. Pearson Education
3. Let us C by Y.P. Kanetkar, BPB Publication
4. Beginning Java Script ,4Ed by Jeremy Mcpeak Paul Wilton

List of Experiments

1. Study of basic structure of computer system – Internal Components & peripherals.
2. Study of windows/Linux commands & create a file using any editor in Linux.
3. Create a document using any word processor (In Linux (open office) /Windows (Microsoft office)).
4. Use any spreadsheet application to manipulate numbers, formulae and graphs (In Linux/Windows).
5. Use any power point presentation application and create a professional power point Presentation using text, image, animation etc. (In Linux/Windows).
6. Create a simple web page using HTML/VB Script
7. Create a simple web page using Java Script.
8. Five programs of ‘C’ Language on Linux/Windows platform.

Submission: Completed Journal

**First Year B.Tech Textile Technology
Semester-II**

Sr. No.	Course Code	Name of the Course	Group	Teaching Scheme				Credits
				Theory Hrs/Week	Tutorial Hrs/Week	Practical Hrs/Week	Total	
1	TTL141	APPLIED MECHANICS	B	3			3	3
2	TTL142	TEXTILE MATHEMATICS-II	A	3			3	3
3	TTL143	INDUSTRIAL CHEMISTRY	A	3			3	3
4	TTL144	ELECTRICAL TECHNOLOGY	B	3			3	3
5	TTL145	YARN FORMING TECHNOLOGY-II	D	3			3	3
6	TTL146	FABRIC FORMING TECHNOLOGY-II	D	3			3	3
7	TTP147	INDUSTRIAL CHEMISTRY LAB	A			2	2	1
8	TTP148	ELECTRICAL TECHNOLOGY LAB	B			2	2	1
9	TTP149	YARN FORMING TECHNOLOGY-II LAB	D			2	2	1
10	TTP150	FABRIC FORMING TECHNOLOGY-II LAB	D			2	2	1
11	TTL151	PROFESSIONAL COMMUNICATION LAB	C	1		2	3	2
Total				19	1	10	29	24

Group Details

- A: Basic Science
- B: Engineering Science
- C: Humanities Social Science & Management
- D: Professional Core Courses & Professional Elective
- E: Free Elective
- F: Seminar/Training/ Project

First Year B. Tech. Textile Technology - Semester II

TTL141: APPLIED MECHANICS

Teaching Scheme		Evaluation Scheme	
Lectures	3 Hrs. /Week	SE-I	25
Credits	3	SE-II	25
		SEE	50
		Total	100

Course Objectives

1. To understand the concept of forces and various laws related to force with basic principles, theorems and concepts of mechanics.
2. To understand the concepts like equilibrium, support reactions, friction, moment of inertia and use of simple machines.
3. To study and analyse the effect of various types of forces on the bodies in static and dynamic conditions.
4. To interpret the concept of transmission of motion and power in various machines by using various drives and bearings used in textile machines.

Course Outcomes:

1. Understand the concept of forces and various laws related to force with basic principles, theorems and concepts of mechanics.
2. Understand the concepts like equilibrium, support reactions, friction, moment of inertia and use of simple machines.
3. Analyse the effect of various types of forces on the bodies in static and dynamic conditions.
4. Interpret the concept of transmission of motion and power in various machines by using various drives and bearings used in textile machines

Course Contents	Hrs.
<p>Unit 1 Fundamentals of statics Statics, dynamics, Fundamental units of measurements, Metric system of units, SI. System, Scalar and Vector quantities. Force, system of forces, Resultant force and equilibrant, principle of transmissibility of force, moment of force. Couple, Law of parallelogram of forces, Varignon's theorem, Composition and resolution of Coplanar concurrent and non concurrent forces.</p>	7
<p>Unit 2 Equilibrium Equilibrium of Coplanar forces, Conditions of equilibrium, free body diagram, Lami's theorem. Friction: Introduction to friction, types of friction, Laws of friction. (No numerical examples on friction). Beams: Types of beams, Types of Loads, Types of supports, Analysis of</p>	7

Simply supported beams.

Unit 3	Moment of Inertia	7
	Centroid and Centre of gravity, Centroid of composite areas, Radius of gyration, parallel axis theorem, perpendicular axis theorem, Moment of inertia of composite sections.	
Unit 4	Lifting Machines	5
	Mechanical advantage, velocity ratio, efficiency, law of machine, effort lost in friction, load lost in friction, Study and numerical examples on simple machines- Simple screw jack, Simple axle and wheel, differential axle and wheel, worm and worm wheel.	
Unit 5	Kinematics and Kinetics	7
	Kinematics of Linear motion: Equations of linear motion with constant and variable acceleration, motion under gravity.	
	Kinematics of Angular motion: Relation between angular motion & linear motion, Equations of angular motion, Centrifugal & centripetal forces, Motion along a curved path, Banking of roads.	
	Kinetics: Newton's laws of motion, Mass moment of inertia, D'Alemberts principle, work, power, energy, impulse, Work- Energy Principle, Impulse-Momentum Principle, Principle of conservation of energy.	
Unit 6	Transmission of motion and power	6
	Belt, rope, chain and gear drives, P.I.V. drives, Type of gears and gear drives, Gear trains, velocity ratio, advantages of gear drives, uses in textile machines, Concept of epicyclic gearing. Types of bearing and their applications (Only theory, no numerical examples on this topic)	

Reference Books:

1. Engineering Mechanics by R. K. Bansal and Sanjay Bansal, Laxmi Publications.
2. Applied Mechanics by R.S. Khurmi, S. Chand Publications.
3. Engineering Mechanics by S. S. Bhavikatti, New Age International Pvt. Ltd.
4. Engineering Mechanics by S. Ramamrutham, DhanpatRai and Sons.
5. Fundamentals of Engineering Mechanics by S. Rajasekaran, Sankarasubramanian, Vikas Publishing House.
6. Applied Mechanics by S.N. Saluja, SatyaPrakashan, New Delhi
7. Engineering Mechanics by S. B. Junnarkar, Charotar Publishing House Pvt. Ltd.
8. Vector Mechanics for Engineers Vol. I & II, by Beer &Johstan, Tata Mc-Graw Hill Publication

First Year B. Tech. Textile Technology - Semester II

TTL142: TEXTILE MATHEMATICS-II

Teaching Scheme	
Lectures	3 Hrs. /Week
Credits	3

Evaluation Scheme	
SE-I	25
SE-II	25
SEE	50
Total	100

Course Objectives

1. Introduce students with the formulae, methods related to reduction formulae, special functions, multiple integrals and its applications.
2. Introduce students to mathematical methods which suits to numerical differentiation and curve fitting.
3. Prepare students with mathematical knowledge so that they can understand bivariate data distribution, correlation and regression.
4. Develop ability to identify, formulate & solve textile engineering problems of probability distribution.

Course Outcomes

At the end of the course students will be able to

1. Solve problems related to reduction formulae, special functions, multiple integrals and its applications.
2. Solve problems related to numerical differentiation and curve fitting.
3. Collect textile testing data & find the correlation and regression.
4. Evaluate and interpret probability distribution.

Course Contents

- Unit 1. Integral Calculus: 7 Hrs.**
 $\int_0^{\pi/2} \sin x dx$, $\int_0^{\pi/2} \cos x dx$, Gamma function, Beta Function, Multiple integrals: Introduction, solution, change of order & Change of variables method.
- Unit 2. Applications of integration: 6 Hrs.**
 Area, Mass of lamina using double integrals only. Volume using triple integral only.

Unit 3.	Numerical Differentiation & curve fitting: Newton's forward & backward formulae, Sterling's formula. Newton's divided difference formula. Fitting of curves $y=a+bx$, $y=a+bx+cx^2$, $y=abx$ by least square method.	7 Hrs.
Unit 4.	Bivariate data: Correlation: types, coefficient of correlation, properties. Rank correlation coefficient & computation. Regression: lines of X on Y & Y on X, regression coefficients, properties & computation.	7Hrs.
Unit 5.	Probability distribution: Random variable: types, introduction laws of probability distribution, types of probability distribution, pmf & pdf, expectation of random variable. MGF of random variable. Standard discrete probability distributions: Binomial probability distribution: Definition, properties, fitting & examples. Poisson probability distribution: Definition, properties, fitting & examples	7 Hrs.
Unit 6.	Standard continuous probability distributions: Normal probability distribution: Definition, properties, standard normal distribution & examples. Chi-square probability distribution (χ^2): Definition & properties only. t-probability distribution: Definition & properties only. F-probability distribution: Definition & properties only. Examples of t, χ^2 , & F are not expected.	5 Hrs.

Reference Books

1. A textbook of applied mathematics Vol.-I & II by P.N. & J.N. Wartikar.
2. Higher engineering mathematics by B.S. Grewal
3. A textbook of applied mathematics by Bali, Saxena & Iyengar.
4. Mathematical Statistics by J.E. Freund.
5. Probability & Statistics for engineers by Johnson.
6. Statistical methods by Kumbhojkar

First Year B. Tech. Textile Technology - Semester II

TTL143: INDUSTRIAL CHEMISTRY

Teaching Scheme		Evaluation Scheme	
Lectures	3	SE-I	25
Credits	3	SE-II	25
		SEE	50
		Total	100

Course Objectives

1. To explain water quality parameters and treatment methods.
2. To describe the chemistry of carbohydrate and proteins.
3. To explain the metallic materials, corrosion and its prevention.
4. To describe characteristics of fuels and determine calorific value of fuels.

Course Outcomes

At the end of the course students will be able to

1. Explain water quality parameters and select proper water treatment method.
2. Describe the chemistry of carbohydrates and proteins.
3. Describe the metallic material and prevent corrosion.
4. Evaluate the quality of fuels.

Course Contents

Unit 1. Water

Introduction, impurities in natural water, water quality parameters: - pH, acidity, alkalinity, total solids, BOD, COD, oils and greases, hardness: definition, types, units and numerical problems, ill effects of hard water in textile industry, boiler feed water, causes & disadvantages of scale and sludge formation, priming, foaming and caustic embrittlement, treatment of water by Zeolite process, ion exchange process, reverse osmosis. **7 Hrs.**

Unit 2. Carbohydrates

Introduction, classification, structure of glucose, **starch**: sources, constitution, properties; **properties of starch paste**: soluble starch and dextrin, action of enzymes, manufacture of starch from maize, cellulose: sources, constitution, chemical and physical properties, methods of pulp making. **7 Hrs.**

Unit 3. Proteins

Introduction, nature of amino acids, classification, chemical properties, nature and classification of proteins, chemical properties, denaturing of proteins, isoelectric point, composition and chemical structure of protein **7 Hrs.**

fibres like wool and silk.

Unit 4. Metallic Materials

Introduction, alloys: definition, classification, purposes of making alloys, composition, properties and applications of ferrous alloys: plain carbon steels, stainless steel, non-ferrous alloys: brass and bronze, nichrome, duralumin.

6 Hrs.

Unit 5. Corrosion

Introduction, definition, causes, classification, atmospheric corrosion, electrochemical corrosion and mechanisms, factors affecting the rate of corrosion, prevention of corrosion by proper selection of material and proper design, cathodic protection, metallic coatings: hot dipping, metal spraying and electroplating.

6 Hrs.

Unit 6. Fuels

Introduction, classification, properties, characteristics of good fuel, comparison between solid, liquid and gaseous fuels, coal and coal formation, determination of calorific value by Bomb and Boy's calorimeter, numerical problems. Fuel cells: definition, classification, advantages, limitations and applications.

6 Hrs.

Reference Books

1. Engineering Chemistry by Jain and Jain.
2. Chemistry of Organic Textile Chemicals by Dr. V.A. Shenai.
3. Text Book of Engineering Chemistry by Shashi Chawla.
4. A Text Book of Engineering Chemistry by S. S. Dara
5. Surfactants and Polymers in Aqueous Solutions by Jonsson, Lindman, Holmberg, Kronberg.

First Year B. Tech. Textile Technology - Semester II

TTL144: ELECTRICAL TECHNOLOGY

Teaching Scheme		Evaluation Scheme	
Lectures	3 Hrs. /Week	SE-I	25
Credits	3	SE-II	25
		SEE	50
		Total	100

Course Objectives

1. To understand various definitions, laws and concepts involved in electrical & magnetic circuits.
2. To understand concepts of elements & parameters in single phase & three phase AC circuits.
3. To understand working of electrical equipments like Transformer & Three phase induction Motors.
4. To explain concept of energy audit, power quality & modern methods.

Course Outcomes

At the end of the course students will be able to

1. Understand fundamental principles of electrical & magnetic circuit.
2. Understand to predict the behavior of any element with respect to AC supply.
3. Design and conduct experiments, as well as to calculate the ratings & parameters of Transformer & Three phase induction Motors.
4. Understand concept of energy audit & its content related to saving.

Course content

- Unit 1. Fundamentals of Electrical circuits** **7 Hrs.**
- A) D.C. Circuits:** Ohm's Law, Kirchoff's laws, mesh and node analysis, Energy conversions between electrical, mechanical, thermal quantities.
- B) Magnetic Circuits:** Flux, flux density, Reluctance, field intensity, B-H curve, series magnetic circuits.
- Unit 2. Single Phase A.C. Circuits:** Generation of sinusoidal voltage, R.M.S. & Average value, form factor, phase representation of A.C. quantities, impedance, R-L, R-C, R-L-C series circuits, powers, power factor improvement by capacitor method. **7 Hrs.**

Unit 3.	Three Phase A.C. Circuits: Introduction to three phase supply and its necessity, Generation of three phase A.C. voltage, balanced system, relation between line and phase quantities in star and delta.	7 Hrs.
Unit 4.	Single Phase Transformer Construction, operating principle, Types, emf equation, Transformation Ratio, operation on no load and with load, losses, efficiency, voltage regulation, applications.	8 Hrs.
Unit 5.	Three Phase Induction Motor Working Principle, Constructional Details, Types, Rotating Magnetic Field Theory, Torque Equation, Torque – Slip Characteristics, Speed Control Methods, Necessity of starters, Types of Starters, Variable Frequency Drive (VFD), application in Textile Industry.	8 Hrs.
Unit 6.	Energy Audit Introduction of energy audit, power quality, concept of energy efficient lighting system & motors.	2 Hrs.

Reference Books

1. Elements of electrical Engineering by U.A. Bakshi
2. Electrical Technology by U.A. Bakshi
3. Basic Electrical Engineering by B. H. Deshmukh.
4. A text book in electrical technology by B. L. Thareja
5. Fundamentals of Electrical Engineering by Ashfaq Husain.

First Year B. Tech. Textile Technology - Semester II

TTL145: YARN FORMING TECHNOLOGY-II

Teaching Scheme	
Lectures	3 Hrs. /Week
Credits	3

Evaluation Scheme	
SE-I	25
SE-II	25
SEE	50
Total	100

Course Objectives

1. To explain working principles of carding ,draw-frame and speed-frame technology
2. To describe constructional details and design aspects of machine parts and mechanisms involved carding, draw-frame and speed-frame.
3. Explanation of process parameters and related calculations of carding, draw-frame and speed-frame.
4. Describe utilities, maintenance needs and features of modern carding, draw-frame and speed-frame.

Course Outcomes

At the end of the course students will be able to

1. Understand the Carding technology
2. Understand the Draw Frame technology
3. Understand Speed Frame technology
4. Evaluate cotton preparatory process

Course Contents

- Unit 1.** Feed to Card – Principle and concept of chute feed to card. Advantages and limitations. **8 Hrs.**
 Revolving Flat Card –
 General construction of Card.
 Detailed study of design developments in Taker in zone, Cylinder Flat Carding Zone – Doffer Zone.
 Driving arrangement, production calculations.
- Unit 2.** Transfer efficiency of card – Definition, Importance, Factors affecting on Transfer Efficiency of card. **6 Hrs.**
 Auto-levelers at Card – Basic principle, Autoleveler used on card, Working Principle of autoleveler. Card Clothing, Assessment of performance of card.

- Unit 3.** Functions of draw-frame, Principles of drafting and doubling. Drafting wave, Behavior of fibres in drafting, Study of constructional details of draw frame. Production Calculations. Evolution of drafting systems in draw-frame. **6 Hrs.**
- Unit 4.** Study of maintenance schedule for draw frame. Assessment of performance of draw-frame. Defective production Causes and remedies for the same. Autoleveler used on draw frame. **5 Hrs.**
- Unit 5.** Objects of speed frame. Constructional aspects of Speed-frame – Creel, Top arm apron drafting system, Top roller loading systems used on speed frame, Spindle & Flyer assembly, Stop motions. **8 Hrs.**
- Unit 6.** Study the objectives of mechanisms like – Building Mechanism, Differential motion, Swing motion. **6 Hrs.**
Performance assessment of Speed-frame, Zero break concept, block creeling, Maintenance of speed frame.

Reference Books

1. The Textile Institute Publication –Manual of Textile Technology-Short Staple Spinning Series Vol I to V by W. Klein
2. The characteristics of Raw Cotton by P. Lord. The Textile Institute Publication, Manual of Cotton Spinning Vol II, Part-I.
3. Fundamentals of Spun Yarn Technology, By Carl Lawrence.
4. Blow room and carding –Training program conducted by NCUTE, IIT Delhi.
5. Carding by F. Charanlay. The Textile Institute publication, Manual of cotton spinning series Vol. - III.
6. Technology of cotton spinning by J. Janakiram.
7. Drawing, Combing and roving and speed frame by Zoltan, S. Szaloky, The Institute of Textile Technology, Verginia

First Year B. Tech. Textile Technology - Semester II**TTL146: FABRIC FORMING TECHNOLOGY-II**

Teaching Scheme		Evaluation Scheme	
Lectures	3 Hrs. / Week	SE-I	25
Credits	3	SE-II	25
		SEE	50
		Total	100

Course Objectives

1. To explain warp preparatory processes like warping & sizing
2. To explain and demonstrate various shedding mechanisms.
3. To describe different types of weaves and its derivatives and create different weaves with drawing and lifting plans
4. To explain various motions on loom

Course Outcomes

At the end of the course students will be able to

1. Understand warp preparatory processes like warping & sizing.
2. Understand various shedding mechanisms.
3. Understand different types of weaves and its derivatives (Understand) and create different weaves with drawing and lifting plans.
4. Understand various motions on loom.

Course Contents**Unit 1. Warping****Hrs.****06**

1. Need, Objectives, classification of warping process
2. Warping machine: - principle of operation of beam warping machine, types of creels, functions of different elements present on creel and headstock of warping Machine.
3. Principles of operation of sectional warping machine.

Unit 2. Sizing**08**

1. Need: Objectives, Techniques of sizing process: hank sizing, ball warp sizing, slasher sizing.
2. Sizing machine: Various zones, their functions, creel and the types with comparison, elements in sow box and their functions, various drying arrangements and drying mechanism in each. Head stock - dry splitting, measuring, marking, winding, beam pressing etc.

3. Size Ingredients: Types (natural, synthetic), their functions, examples.
4. Size cooking: - Need, equipments available, method of addition of ingredients and its importance.

Unit 3. Weaving 08

1. Study of dobby: Types of dobby, Climax, cam dobby, method of pegging, heald reversing motion.
2. Study of Jacquard: Parts of jacquards, sizes and figuring capacities of jacquard, harness ties, double lift double cylinder.
3. Weft patterning: - drop box motions, pattern chain, and card saving.

Unit 4. Derivatives of Basic Weaves 09

Representation of the following weaves on graph paper with design, draft, peg-plan and denting order.

1. Derivative of plain weave-warp and weft rib, matt (regular and irregular)
2. Derivatives of twill: pointed, herringbone, different types of broken and rearranged twills, transposed twill, curved twills, combined twill, diamond,
3. Derivatives of satin/sateen weave, irregular satin, satin checks.

Unit 5. Towel & Other weaves 04

1. Towelling structures: Ordinary and brightened honeycomb, huckaback, Mock leno.
2. Crepes by various methods.

Unit 6. Calculations 04

1. Warping : - Production of warping machine, efficiency based on speed and stoppages, weight of yarn on warper's beam, organizing the set (based on cones available, creel capacity, fabric construction etc.) Calculation of number of sections, section width.
2. Sizing : - Production and efficiency of sizing machine.

Reference Books

1. Principles of Weaving by Marks and Robinson.
2. Weaving Mechanism by Fox.
3. Weaving by D.B. Ajagaonkar, Sriramulu and Talukdar.
4. Sizing by D.B. Ajagaonkar.
5. Weaving by BTRA.
6. Fancy Weaving by K.T. Aswani.
7. Textile colour and design by Watson.
8. Woven cloth construction by Marks and Robinson.
9. Winding and Warping by M.K. Talukdar.

First Year B. Tech. Textile Technology - Semester II
TTP147: INDUSTRIAL CHEMISTRY LAB

Teaching Scheme	
Practical	2
Credits	1

Evaluation Scheme	
CIE	50
SEE	--
Total	50

List of Experiments

1. Determination of total hardness of water.
2. Determination of alkalinity of water.
3. Determination of chlorides in water.
4. Determination of dissolved oxygen of water.
5. Determination of COD of water.
6. Determination of total solids & suspended solids of water.
7. Determination of rate of corrosion of metal.
8. Estimation of copper in bronze.
9. Analysis of starch.
10. Qualitative analysis of carbohydrates.
11. Qualitative analysis of proteins.
12. Proximate analysis of solid fuel.

Submission

1. Completed Journal

First Year B. Tech. Textile Technology - Semester II

TTP148: ELECTRICAL TECHNOLOGY LAB

Teaching Scheme	
Practical	2 Hrs. /Week
Credits	1

Evaluation Scheme	
CIE	50
Total	50

List of Experiments

1. Introduction to Electrical Engineering Lab.
2. Verification of Ohm's Law.
3. Verification of Kirchoff's Current Law.
4. Verification of Kirchoff's Voltage Law.
5. Determination of power factor of R L series circuit.
6. Determination of R & L of a choke coil.
7. Study of Phasor Relationship in R-L-C series circuit.
8. Direct load test on Single Phase Transformer.
9. Reversal of Rotation of Three Phase Induction Motor.
10. Speed control of Three Phase Induction Motor.
11. Direct load test on Three Phase Induction Motor.
12. Study of starters.

Submission

1. Completed Journal.

First Year B. Tech. Textile Technology - Semester II

TTP149: YARN FORMING TECHNOLOGY II LAB

Teaching Scheme	
Practical	2 Hrs. /Week
Credits	1

Evaluation Scheme	
CIE	50
Total	50

List of Experiments

1. Study of chute feed system & constructional details of a card.
2. Driving arrangement and calculations of carding machine
3. Settings of various parts of feed zone of carding
4. Settings of various parts of Delivery zone of carding
5. Study of constructional details, Driving arrangement and calculation of Draw Frame
6. Study of auto-levelers used on card and Draw frame
7. Demonstration of wire mounting, grinding , roller mounting and buffing machine
8. Study of constructional details of speed frame
9. Driving arrangement and calculation of Speed Frame.
10. Study of coils per inch of speed frame & differential gearing.
11. Study of building mechanism of speed frame.

Submission

1. Completed Journal

First Year B. Tech. Textile Technology - Semester II**TTP150: FABRIC FORMING TECHNOLOGY-II LAB**

Teaching Scheme	
Practical	02 Hrs/Week
Total Credits	1

Evaluation Scheme	
CIE	50
SEE	--
Total	50

List of Experiments

1. Setting of Tappet shedding motion.
2. Setting of cone over pick motion
3. Setting of side weft fork and anti-crack motion
4. Study of Climax dobby and fabric sample weaving by dobby pegging with different weaves
5. Setting of Climax dobby
6. General study of drop box motion
7. General study of mechanical Jacquard and method of card cutting.
8. Study of Sectional warping machine
9. Fabric Analysis
10. Fabric Analysis
11. Fabric Analysis
12. Visit to warping and sizing unit

Submission

1. Completed Journal

First Year B. Tech. Textile Technology - Semester II

TTP151- PROFESSIONAL COMMUNICATION LAB

Teaching Scheme	
Lectures	1 Hrs./Week
Practicals	2 Hrs. /Week
Total Credits	2

Evaluation Scheme	
SEE	--
CIE	50
Total	50

Course Objectives

1. To explain the concept of communication
2. To give information about Organizational structure of communication
3. To develop grammatical ability
4. To explain the importance of business correspondence
5. To discuss the importance of verbal and non-verbal Communication
6. To develop oratorical skills like debate, elocution, meetings, extempore

Course Outcomes

At the end of the course students will be able to

1. Understand and apply the importance of communication
2. Understand the structure of organizational communication
3. Understand and apply basic grammar while communicating
4. Design, compose and create different types of business letters.
5. Recognize the importance of verbal and non-verbal communication
6. Prepare themselves for debate, elocution, extempore and meeting.

Course Contents

Unit 1. Understanding Communication 2 Hrs.

Etymological perspective and definition of communication Nature and Importance of Communication, Process of communication – idea or source, sender, encoding process, message, medium or channel, noise, receiver, decoding process, feedback Barriers to Communication, Physical barriers, mechanical barriers, sociocultural, psychological barriers, linguistic and semantics barriers.

Unit 2. Organizational communication 2Hrs

Objectives of communication, Forms of Communication, Formal and

informal communication, methods of communication oral and written communication, networks of communication in the organization upward, downward, horizontal, grapevine communication.

Unit 3.	Development of grammatical ability	2 Hrs.
	Parts of speech, articles , kinds of sentences, punctuation marks	
Unit 4.	Professional Correspondence	3 Hrs.
	Importance, language and style, formats (British & American), Letter Writing, Simple application letter (seeking permission regarding absence etc.), Inquiry and its reply, placing an order, complaint and its adjustment and email etc	
Unit 5.	Techniques of Communication	2 Hrs.
	Techniques of communication, Verbal Communication Non Verbal Communication, appearance, gestures, facial expressions, postures, kinesics, eye contact, silence, haptic, proxemics, paralinguistic, colours	
Unit 6.	Developing Oral Skills	2 Hrs.
	Importance and techniques to improve oral communication: Techniques of formal speech, meetings, Elocution, Extempore, Debate etc	

Reference Books

1. Handbook for Technical Writing by David A. McMurrey, Joanne Buckley, Cengage.
2. A Course in English by J.D. O'Connor.
3. Better English Pronunciation by J.D. O'Connor.
4. Communication Skills Handbook: How to succeed in written and oral communication by Jane Summers, Brette Smith, Wiley India Pvt.Ltd.
5. Personal Development for Life and Work by Masters, Wallace, Cengage.
6. Soft Skills for Managers by Dr. T. KalyanaChakravarthi, Dr. T. LathaChakravarthi, Biztantra.
7. Soft Skills for every one by Jeff Butterfield, Cengage.
8. Behavioural Science by Dr.Abha Singh, Wiley India Pvt.Ltd.
9. An Introduction to Professional English and Soft Skills by Bikram K. Das, KalyaniSamantray, Cambridge University Press New Delhi.
10. Speaking Accurately by K.C. Nambiar, Cambridge University Press New Delhi.
11. Speaking Effectively by Jeremy Comfort, Pamela Rogerson, and Cambridge

University Press New Delhi.

12. Cambridge English for Job Hunting by ColmDownes, Cambridge University Press New Delhi.
13. Body Language by Allen Pease.
14. The Ace of Soft Skills by Gopalswami Ramesh, Mahadevan Ramesh, Pearson Publication, Delhi.

LIST OF TUTORIALS

1. Understanding Self
2. Grammar and vocabulary activities
3. Simple application letter (seeking permission regarding absence)
4. Letter of enquiry and order
5. Letter of complaint and E mail writing
6. Meetings
7. Extempore
8. Vocabulary building & grammar
9. Teamwork- story making
10. Elocution
11. Debate
12. Effective reading (newspaper articles)

Submission

1. Completed assignment books