



REVISED SYLLABUS W.E.F.01ST JULY, 2010											
F.Y. B.TEXT. (TPE) SEMESTER-I											
SR. NO.	COMMITTON TO COURSES	SUBJECTS	TEACHING SCHEME				EXAMINATION SCHEME				
			L	T	DR	PR	TP	TW	OE	PE	SUB. TOTAL
1.1	TT/MMTT/TPE/TC/FT	APPLIED PHYSICS	4	---	---	---	100	---	---	---	100
1.2	TT/MMTT/TPE/TC/FT	TEXTILE MATHEMATICS-I	3	---	---	---	100	---	---	---	100
1.3	TT/MMTT/TPE/TC/FT	ELECTRICAL SCIENCE	3	---	---	2	100	50	---	---	150
1.4	TT/MMTT/TPE/FT	TEXTILE FIBRES	4	---	---	---	100	---	---	---	100
1.5	TT/MMTT/TPE	PRINCIPLES OF YARN MANUFACTURING	4	---	---	2	100	50	---	---	150
1.6	TT/MMTT/TPE	PRINCIPLES OF FABRIC MANUFACTURING	4	---	---	2	100	50	---	---	150
1.7	TPE/TC	LANGUAGE LABORATORY	---	---	---	2	---	50	---	---	50
			22	---	---	8	600	200	---	---	800
L =LECTURES			TP=THEORY PAPER								
T =TUTORIALS			TW=TERM WORK								
DR=DRAWING			OE=ORAL EXAMINATION								
PR=PRACTICALS			PE=PRACTICAL EXAMINATION								

REVISED SYLLABUS W.E.F.01ST JULY, 2010											
F.Y.B.TEXT.(TPE) SEMESTER-II											
SR. NO.	COMMITTON TO COURSES	SUBJECTS	TEACHING SCHEME				EXAMINATION SCHEME				
			L	T	DR	PR	TP	TW	OE	PE	SUB. TOTAL
2.1	TT/MMTT/TPE/TC/FT	APPLIED MECHANICS	3	---	---	---	100	---	---	---	100
2.2	TT/MMTT/TPE/TC/FT	TEXTILE MATHEMATICS-II	3	---	---	---	100	---	---	---	100
2.3	TPE	GENERAL ENGINEERING	3	---	---	3	100	25	---	---	125
2.4	TT/MMTT/TPE/TC/FT	ENGINEERING GRAPHICS	2	---	2	---	100	25	---	---	125
2.5	TPE	YARN MANUFACTURING MACHINERY - I	4	---	---	2	100	50	---	---	150
2.6	TPE	FABRIC MANUFACTURING MACHINERY - I	4	---	---	2	100	50	---	---	150
2.7	TPE/TC	COMPUTER LABORATORY	---	---	---	2	---	50	---	---	50
			19	---	2	9	600	200	---	---	800
L =LECTURES			TP=THEORY PAPER								
T =TUTORIALS			TW=TERM WORK								
DR=DRAWING			OE=ORAL EXAMINATION								
PR=PRACTICALS			PE=PRACTICAL EXAMINATION								

FIRST YEAR B. TEXT. – SEMESTER - I**1.1 APPLIED PHYSICS (TT/MMTT/TPE/TC/FT)**

Lectures	:	4 Hours / Week.
Theory Paper	:	100 Marks, 3 Hours.
Subject Total	:	100 Marks.

- 1. Elasticity:** Load, stress, strain, Hooke's Law of elasticity. Elastic behaviour of solids in general - some peculiar traits, working stress and factor of safety. Factors affecting elasticity. Types of elasticity, work done per unit volume in a strain. Relation between Y , η and K . Poission's ratio, relation between Y , k and Poission's ratio and the relation between Y , η and Poission's ratio he . Twisting couple on a cylinder, Torsional pendulum
- 2. Viscosity:** Newton's Law of viscosity, streamline & turbulent flow, critical velocity, significance of Reynold's number, Poiseuille's equation for flow of liquid through a tube. Experimental determination of η for a liquid - Poiseuille's method, Motion in a viscous medium, terminal velocity, Stoke's law, Stokes method. Ostwald's viscometer, variation of viscosity with temperature. Applications of viscosity in textiles.
- 3. Surface Tension:** Molecular theory of surface tension. Free energy of a surface & surface tension. Excess pressure inside a liquid drop & soap bubble. Relation between radii of curvature, pressure & surface tension. Shape of liquid meniscus in a capillary. Energy required to raise a liquid in a capillary tube. Measurement of surface tension. Factors affecting surface tension. Applications of surface tension in textiles.
- 4. Friction:** Laws of friction, Angle of friction, Sliding & Rolling friction. Necessity of friction. Derivation of relation $T_2/T_1 = e^{\mu \theta}$ (where T_1 & T_2 are incoming & outgoing tensions respectively, θ (Theta) is the angle of friction, μ is the co-efficient of friction). Mechanism of friction. Applications of friction in textiles.
- 5. Optics:** Introduction to reflection, refraction, Laws of refraction, refractive index, total internal reflection, interference & diffraction. Review of simple & compound microscope, expression for magnifying & resolving power. Electron Microscope: Principle, Construction & working. Scanning & transmission electron microscope, its applications in textiles.

- 6. Polarisation:** Polarisation, Brewsters law. Double refraction, Nicol prism, production of plane, circularly & elliptically polarised light. The colour of crystal plates in polarized light, Quarter & half wave plate. Birefringence and Polarising microscope.
- 7. X-ray:** Origin of continuous & characteristic x-ray spectrum, properties, production of x-rays and its applications. X-ray diffraction - Bragg's law of X-ray diffraction, Bragg's x-ray spectrometer spectrometer, Miller indices. Determination of crystal structure by X-ray diffraction technique.
- 8. Photoelectric Effect:** Concept, Einstein's equation of photoelectric effect. Factors influencing the photoelectric effect. Study of various photocells. Use of photosensors in the textile field.

Reference Books:-

1. Elements of Properties of Matter by D.S. Mathur
2. Engineering Physics by B.L. Theraja
3. Modern Physics by B.L. Theraja
4. Engineering Physics by R.K. Gour & Gupta
5. Basic Applied Physics by R.K. Gour.
6. Physics for Engineers by M.R. Srinivasan.
7. Text Book of Optics by Brijlal & Subramanyam
8. Optics by A.K. Ghatak
9. College Physics by Bueche Fredrick J
10. Fundamentals of Physics by Halliday Resnick
11. Perspectives of Modern Physics by Arthur Beiser
12. The general properties of Matter by F. H. Newman
13. University Physics by Hugh D. Loung

FIRST YEAR B. TEXT. – SEMESTER - I

1.2 TEXTILE MATHEMATICS-I (TT/MMTT/TPE/TC/FT)

Lectures	:	3 Hours / Week.
Theory Paper	:	100 Marks, 3 Hours.
Subject Total	:	100 Marks.

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.

2. Successive Differentiation:

Introduction, standard results, Leibnitz rule.

3. Partial Differentiation:

Introduction, total differentiation, Euler's theorem on homogeneous function.
Jacobean ($J.J'=1$) only, Errors & approximation.

4. Curve Tracing:

Rules & examples of curve tracing in Cartesian and Polar Equations only.

5. 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.

6. Measures of central tendency:

Arithmetic Mean (A.M.), Median, Mode, Combined Mean & Computation
Partition values : Quartiles deciles and percentiles & Computation

7. 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

8. Measures of Skewness & kurtosis:

Skewness, types, Karl Pearson's & Bowley's coefficient of skewness & Computation. Kurtosis definition and types only. (No Examples of Kurtosis)

9. Probability:

Random experiment, sample space, event, types of events, Venn diagram Definition, laws of probability & examples.

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. TEXT. – SEMESTER - I**1.3 ELECTRICAL SCIENCE (TT/MMTT/TPE/TC/FT)**

Lectures	:	3 Hours / week.
Practical	:	2 Hours / Week.
Theory Paper	:	100 Marks, 3 Hours.
Term Work	:	50 Marks.
Subject Total	:	150 Marks.

1. D.C. Circuits: Units-6

Basic electrical quantities, voltage, current, power energy, co-relation between electrical, mechanical & thermal quantities, ohm's law with its limitation, Kirchoff's current and voltage law, current division rule. Resistance temperature coefficient (Numerical Problems on with two variables).

2. Magnetic Circuits: Units-4

Concepts of magnetic circuits, MMF, Reluctance, Magnetic flux density, magnetic field strength, definitions and units, comparison of electrical and magnetic circuits, leakage and fringing, Self and mutual inductance, eddy current & hysteresis loss, material used for core of electrical machines. (Numerical on series magnetic circuits)

3. A.C. Fundamentals: Units-4

Faraday's law of electromagnetic induction, Generation of single and three phase quantity, phasor representation, Concept of R.M.S. and Average value, peak value, constructional diagram of three phase alternator. (Simple Numerical).

4. A.C. Circuits: Units-5

Concept of inductive reactance, capacitive reactance, phasor representation of pure R, L, C, & series RL, RC, RLC Circuits, impedance, only concept of parallel resonance, (Numerical problems of series RL, RC, RLC Circuits)

5. Transformer: Units-5

Operating principle of a transformer types of transformers E.M.F. equation of transformer, concept of K, ideal transformer phasor diagram of ideal transformer on no load, phasor diagram of actual single phase transformer on no load, loaded condition with Resistive load, Efficiency and regulation of transformer by direct loading of transformer, condition of max efficiency. Concept of auto-transformer, On

Load Tap Changing Transformer (OLTC). (Simple Numerical on transformer).
Testing of transformer, No load test, short circuit test. Concept of percentage impedance.

6. Electrical Machines:

Units-6

Principle, construction, operation and characteristics of three phase induction motor, motors used in textile industries, inverter driven motors (VFD), Speed control of three phase induction motor, necessity of starters, Application of three phase induction motor. Power triangle, effect of reactive power on power system, power factor, its significance, causes of low power factor, factors affecting it and methods to improve the power factor, in concern with Energy saving, Introduction to APFC panel & its advantages. (only theoretical treatment), introduction to stepper motors and servo motor.

7. Luminaries:

Units-3

Working of sodium vapour lamp, fluorescent lamp, CFL lamps, Calculation of elimination scheme for different purpose, mercury vapour lamp, concept of Energy Efficient lighting system.

8. Power Quality:

Units-3

Concept of power quality, advantages of good quality power, harmonics & its effects, method of harmonic elimination., Introduction to electrical tariffs, simple examples on energy calculations.

9. Introduction to switch gear and protection, instruments:

Concept of ACB, VCB, MCCB, TOD meter

Constraints in electrical control panel

List of Experiments (Any Eight)

1. Introduction to Electrical Engg. Lab.
2. Determination of power factor of R L series circuit.
3. Determination of R & L of a choke coil.
4. Study of Phasor Relationship of RLC circuit.
5. Ratio test on single phase transformer.
6. Direct load test on Single Phase Transformer.
7. Reversal of Rotation of Three Phase Induction Motor.
8. Speed control of Three Phase Induction Motor.

9. Direct load test on Three Phase Induction Motor.
10. Study of starters (Any two).
11. Study of Wiring Circuits.
12. Study of lamps (Any two).

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

FIRST YEAR B. TEXT. – SEMESTER - I

1.4 TEXTILE FIBRES (TT/MMTT/TPE/FT)

Lectures	:	4 Hours / Week.
Theory paper	:	100 Marks.
Subject Total	:	100 Marks.

1) Requirements of Fibres:

Definition of fibre, Difference between staple fibre and filament, Classification of fibres, Essential and desirable properties of apparel grade & technical grade textile fibres, Characteristics of fibre forming polymer, Concepts of molecular weight, Degree of polymerization, Orientation and Crystallinity, Advantages and Disadvantages of natural & man made fibres.

2) Natural fibres:-

Vegetable Fibres:

- i) Cotton - Development of fibre in seed, Morphological structure, Physical & chemical properties, applications.
- ii) Jute- Retting and extraction process, Structure of jute fibre, Physical & chemical properties, applications
- iii) Introduction to other natural fibres like Hemp, Flax, Ramie, Linen, Banana, Pineapple fibres & their applications.

Animal Fibres:

- i) Wool- Types of wool, Grading of wool, Morphological structure, chemical composition, Physical & chemical properties, applications
- ii) Silk - Types of silk, Production of silk, Chemical composition of silk, Physical & chemical properties, applications.

3) Man Made fibres:-

Definitions of Regenerated & Synthetic fibres, Introduction to methods of fibre formation – Melt spinning, Dry spinning and Wet spinning.

Regenerated Fibres:

- i) Viscose rayon: Raw Material, Physical & chemical properties, applications, Concept of high wet modulus fibres,
- ii) Introduction to Acetate & Triacetate fibres.

Synthetic fibres:

- i) Polyamide: Nylon 6 & Nylon 66 fibres – Raw material, Physical & chemical properties, applications.
- ii) Polyester (Polyethylene Terephthalate): Raw material, Physical & chemical properties, applications.
- iii) Polypropylene: Raw material, Physical & chemical properties, applications.
- iv) Polyacrylonitrile Fibre: Acrylic and Modacrylic fibres - Raw material, Physical & chemical properties, applications.
- v) Polyurethane: Raw material, Physical & chemical properties, applications.

Reference Books:-

1. Textile Fibres – Vol.-I by V.A.Shenai
2. Fibre Science And Technology by S.P. Mishra
3. Hand book of Textile Fibres Vol. I & II by Garden & Cook.
4. Man Made Fibres – R.W. Moncrieff.
5. Polymer science- V.Gowariker

FIRST YEAR B. TEXT. – SEMESTER - I

1.5 PRINCIPLES OF YARN MANUFACTURING (TT/MMTT/TPE)

Lectures	:	4 Hours / Week.
Practicals	:	2 Hours / Week
Theory Paper	:	100 Marks, 3 Hours.
Term Work	:	50 Marks
Subject Total	:	150 Marks.

1. Definition of terms – ‘Textiles’, ‘Fibres’, ‘Yarns’ and ‘Fabric’, flow chart of process involved in conversions of fibres into yarns by presently available methods, object of each process. Flow chart of carded & combed yarn.
2. Essential and desirable properties of fibres as textile raw material.
3. Yarn classification, yarn numbering systems and related calculation (English count, tex, denier, woollen & worsted).
4. Mixing & Blowroom – Objects of mixing & blowroom, Types of mixing, Blowroom Machine sequence .
5. Carding – Objects of carding, construction of carding machine,
6. Drawframe – Concept of drafting, requirement of doubling, objectives of drawframe, construction of drawframe machine,
7. Comber Preparatory – Machine sequences used for comber preparatory, objectives of comber preparatory, construction of machine,.
8. Comber: - Objectives of comber , construction of machine.
9. Speedframe – Objectives of speed frame, delivery package, twisting system, construction of machine.
10. Ring Frame – Objectives of ring frame , construction of machine.

List of Experiments:-

1. A study of different types of tools and gadgets used in spinning such as various types of spanners, Calipers, Hammers, gauges, Screw driver, Pliers, Pullers, Oiling and greasing equipment etc.
Gauges –leaf gauge & filler gauge , Hammer – Nylon ,Brass & Iron hammers , Torque wrench , Pliers- Circlip Plier (outer & inner), Demonstration of all tool & gauges

2. Study of different types of drives and calculations based on the same. Belt drive - Flat and V, Open and Cross, Gear Drive, Simple carrier, compound carrier, Helical, Bevel. Chain and sprocket wheel drive. Worm and worm wheel drive, Timer belts.
Simple examples of speed calculation. Advantages & limitations , Energy consumption (Slipage) , Cross checking the calculated speed by using technometer. Importance of safety gears.
3. Study of various types of bearings used on spinning machines and their lubrication. Plain, Journal, Bush, Ball, Roller, Needle and others.
Application of each type of bearing is demonstrated on machine
Preparation of cut models of different bearings, Advantages & limitations
4. Processing of material on Blow Room, Carding, Draw frame ,Comber,Speed Ferame & Ring Frame
For demonstration of spinning process.
Testing of out put material for hank calculation
5. Introduction to spinning process, sequence, machines (carded/combed).
Explanation of objects of each machine by conducting mill visit. Visit should be started from cotton godown and finished in yarn godown.
6. Study of Blowroom line - Flow chart - Machine positioning in Blowroom.
Mill visit for conventional & modern Blow Room. Also sample collection at feed and delivery stages.
- 7 Study of Card - Dimension, Construction and passage of material .
- 8 Study of Draw Frame - Dimension, Construction and passage of material .
- 9 Study of Comber preparatory - Dimension, Construction and passage of material
- 10 Study of Comber - Dimension, Construction and passage of material .
- 11 Study of Speed Frame - Dimension, Construction and passage of material .
- 12 Study of Ring Frame- Dimension, Construction and passage of material .

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
3. Publication, Manual of Cotton Spinning Vol.II, Part-I.

4. 'Opening and Cleaning' by Shirley. The Textile Institute Publication, Manual of Cotton Spinning Vol. II, Part-II.
5. 'Opening Cleaning and Picking' by Dr.Zoltan S. Szaloki, Institute of Textile Technology, Virginia.
6. 'Cotton Opening and Picking' by G.R. Merril.
7. 'Cotton Ginning' Textile Progress, The Textile Institute Publication.
8. 'Fundamentals of Spun Yarn Technology' by Carl A. Lawrence
9. 'Cotton Growing and Marketing', J.S. Parmar, Tecoya Trend Publications.
10. 'Cotton Varieties' by Parmar, Tecoya Trend Publication.
11. Blowroom and Carding- Training Programme conducted by NCUTE, IIT, Delhi.
12. Carding by F. Charanlay. The Textile Institute publication, Manual of cotton spinning series Vol-III.
13. Essential calculations of practical cotton spinning by T.K. Pattabhiraman.
14. Principles of Roller drafting & Irregularity of the drafted sliver by G A R Foster. The Textile Institute publication, Manual of cotton spinning vol-IV part I.
15. 'Blowroom', 'Carding', 'Drawframe, Comber -by Prof.A.R.Khare.

FIRST YEAR B. TEXT. – SEMESTER - I

1.6 PRINCIPLES OF FABRIC MANUFACTURING (TT/MMTT/TPE)

Lectures	:	4 Hours / Week.
Practical	:	2 Hours / Week
Theory Paper	:	100 Marks, 3 Hours.
Term Work	:	50 Marks
Subject Total	:	150 Marks.

I) INTRODUCTION

1. Nature of textile industry in India
2. Applications/classification of fabrics
3. Yarn numbering systems: cotton counts, metric count, Tex, denier, calculations
4. Weaving processes: objects of all processes. Different kinds of fabrics: Grey, mono-colour, bi-colour, warp or weft stripes, checks.
5. Process flow charts for various fabrics

II) ORDINARY WINDING

1. Need: - Limitation of ring spinning to make big packages and good yarn, yarn faults in spinning, their consequences on subsequent processes and fabric quality, objects of winding process
2. 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 unwinding accelerator, pre-clearers, tensioners, yarn clearers, kink remover, cradle weighting, drum drive, types of packages produced.
4. Knotting: types of knots, characteristics of good knot, comparison, applications,
5. Classimat classification of yarn faults, its use.
6. Common package faults: - patterning, conditions for patterning, anti-patterning devices, soft packages, wild yarn, snarls etc.
7. Geometrical aspects: - Cone angle, angle of wind, wind per double traverse, surface speed, traverse speed, winding speed, calculations

8. Calculations: winding speed, production/spindle & per machine, and efficiency.

III) PIRN WINDING

1. Objectives: - rewind weft, its advantage, need
2. Details semi automatic and automatic 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.
4. Calculations: - Average pirn diameter, winding speed, production / spindle / & per machine, efficiency, number of looms fed by spindle.

IV) FABRIC FORMING

1. Various methods of fabric forming: - Weaving, knitting, braiding, non-woven, brief description of all methods and processes involved in it. Applications of fabrics from various methods,
2. Outline of weaving mechanisms: - Classification of weaving machines, Basic motions, primary, secondary and auxiliary, objects,
3. Primary motions: Detailed study of -shedding, picking, and beat-up
4. Secondary motions: Detailed study of take up and negative let-off.
5. Auxiliary motions: - Detailed study of weft fork, anti crack, oscillating backrest, and warp-protecting motions (loose and fast reed), ring and roller, full width temples.
6. Calculations: -warp weight, weft weight, fabric weight / sq. m fabric production/loom, weft consumption per loom /day etc.

V) FABRIC STRUCTURE

1. Constructional details: - Warp /weft count, thread densities, width, length, selvages; light, medium, & heavy constructions, capability of weaving machines to weave different 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 plans, need, importance, and precautions, practice.
3. Study of weaves: - plain, twill and satin (basic weaves)

List of Experiments:-

1. Study of Weaving preparatory and weaving Processes
2. Study of various types of tools and gauges used in weaving
3. To study different principles of transmission of motion in weaving (Drives)
4. General study of ordinary weaving machine
5. To Study method of fabric analysis
6. General study of precision and drum winding machine
7. To study, dismantling and resetting of tappet shedding mechanism
8. To study, dismantling and resetting of cone over pick mechanism
9. To Study, dismantling and resetting of negative let-off and take-up mechanism
10. Study of weaving accessories and drawing-in
11. Fabric analysis of given fabric sample
12. Fabric analysis of given fabric sample
13. Visit to ordinary weaving machine unit

Term Work -

Term work assessment will be on the basis of regularity of attendance, satisfactory completion of experiments, regular submission of journal and tests conducted.

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 By Fox.
5. Weaving Mechanism by N.M. Banerjee.
6. Weaving Mechanism by K.T. Aswani.
7. Winding, Warping & Weaving – A.R. Garde (ATIRA Publication)
8. Weaving Mechanism by Chakrabarty.
9. Winding & Warping by Talukdar M.K.
10. Yarn Preparation-Vol-I by Sengupta.
11. Weaving Calculation by Sengupta.
12. Textile Mathematics-Vol.I by J.E. Booth.
13. Winding by BTRA.
14. Weaving by Unsenko.
15. Fibre to Fabric by P.R. Lord.

FIRST YEAR B. TEXT. – SEMESTER - I

1.7 LANGUAGE LABORATORY (TPE/TC)

Practicals	:	2 Hours/week
Term Work	:	50 Marks

I) Communication

Nature and Importance of Communication
Process and Barriers to Communication
Forms of Communication

II) Techniques of Communication.

Techniques of Formal Speech.
Verbal Communication
Non Verbal Communication – Body Language.

III) Issues in English

Getting started – questions – Cloze – Spelling – Diction – Listening – Word – Sentences – Vocabulary – Pictures & Words – Opposite Meaning – Word order- Grammar – Simple present – Simple Past – Present continuous – Future Tense – Personal Pronouns – Pronunciation – words sentences – writing – punctuation – questions – opinions – different genres.

IV) Pronunciation

The phonemic alphabet in English
Similar sounds
Word and phrasal stress
Stress and Rhythm
Rhythms from Rainland

V) Study skills success

Listening – Speaking – Reading – Writing – Vocabulary – Visuals.

VI) Tense Buster

Articles – Reported speech – Passives – Phrasal verbs – How to learn faster.

VII) Business English

A formula for clear writing – Formal or Informal – Which words – written communication

Reference Books:-

- 1) Communication Skills for Engineers – Sunita Mishra – Pearson Education
- 2) Language Software's (1 to 22 Software's)

List of Software's

1. Ease one
2. Click info English
3. Tense Buster
4. Study Skills Success
5. Author Plus with result Manager
6. Sky Pronunciation Suite
7. Pronunciation Power
8. Test Preparation for TOEFL
9. Let's do Business Presentation
10. Let's Do Business Meetings
11. Let's Do Business Negotiations
12. Let's do Business Telephoning
13. Report Writes – Technical Report
14. Report Writers Business Report
15. Report Writers – Letters Faxes, E-Mails
16. Connected Speech
17. Vocabulary Builder
18. Business Territory
19. Error & Terror
20. A Taste for English
21. Issues in English
22. Voice Books

FIRST YEAR B. TEXT. – SEMESTER - II

2.1 APPLIED MECHANICS (TT/MMTT/TPE/TC/FT)

Lectures	:	3 Hours / Week.
Theory Paper	:	100 Marks, 3 Hours.
Subject Total	:	100 Marks.

1. Statics, dynamics, Fundamental units of measurements, Metric system of units, SI. System, Scalar quantities, Vector quantities.
Force, system of forces, principle of transmissibility of force, moment of force. Couple, resultant, parallelogram of forces, triangle of forces, polygon of forces, Varignons theorem, Composition and resolution of Coplanar concurrent and non-concurrent forces. Analytical and graphical method.
2. Equilibrium of Coplanar forces. Conditions of equilibrium, Free body diagram, Lami's theorem, Support reactions of for simply supported beams.
3. Centre of gravity, Centroid of a uniform lamina, Centroid of composite areas, Moment of inertia of sections, parallel axis theorem, perpendicular axis theorem.
4. Lifting Machines : Mechanical advantage, velocity ratio, efficiency, law of machine, effort lost in friction, load lost in friction, Simple machines such as smooth inclined plane, screw jack, simple and differential axle and wheel, worm and worm wheel, single and double purchase crab.
5. Friction: Static friction, dynamics friction, laws of friction, coefficient of friction, angle of friction, angle of repose. Friction of a body lying on an inclined plane.
6. Motion: Equations of linear motion with constant acceleration, variable acceleration, motion under gravity.
Angular motion, relation between angular motion and linear motion, equations of angular motion.
7. Force and motion of translation: Mass, momentum, inertia, Newton's laws of motion, impulse, principle of conservation of momentum, work, power, energy. Principle of conservation of energy.
8. Couples and Motion of rotation: Angular momentum, mass moment of inertia, radius of gyration, kinetic energy of rotatory flywheels.
9. Transmission of motion and power by belt, rope, chain, gears. Type of gears.
Types of gear drive: Gear trains, velocity ratio, advantages of gear drives, uses in textile machines. Concept of epicyclic gearing.

Reference Books:-

1. Engineering Mechanics by S. Ramamrutham.
2. Engineering Mechanics by Junnarkar.
3. Applied Mechanics Satya Prakashan, New Delhi by S.N. Saluja.
4. Vector Mechanics for Engineers Vol – I & II, Tata Mc-Graw Hill Publication by Beer & Jonhstan.
5. Engineering Mechanics by R. K. Bansal and Sanjay Bansal
6. Applied Mechanics by R.S. Khurmi.
7. Engineering Mechanics, New Age International Pvt. Ltd. By S. S. Bhavikattis,

FIRST YEAR B. TEXT. – SEMESTER - II**2.2 TEXTILE MATHEMATICS-II (TT/MMTT/TPE/TC/FT)**

Lectures	:	3 Hours / Week.
Theory Paper	:	100 Marks, 3 Hours.
Subject Total	:	100 Marks.

1. Integral Calculus:

Reduction formulae for $\int_0^{\pi/2} \sin^n x \, dx$, $\int_0^{\pi/2} \cos^n x \, dx$, Gamma function, Beta function

2. Multiple integrals:

Introduction, solution, change of order & change of variables method.

3. Applications of integration:

Area, Mass of lamina using double integrals only. Volume using triple integral only.

4. Numerical Differentiation & curve fitting:

Newton's forward & backward formulae, Sterling's formula. Newton's divided difference formula.

Fitting of curves $y=a+bx$, $y=a+bx+cx^2$, $y=ax^b$ by least square method.

5. 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.

6. Probability distribution:

Random variable: types, introduction & types of probability distribution, pmf & pdf, expectation of random variable. MGF of random variable.

7. Standard discrete probability distributions:

Binomial probability distribution: Definition, properties, fitting & examples.

Poisson probability distribution: Definition, properties, fitting & examples.

8. 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.

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.

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2.4 ENGINEERING GRAPHICS (TT/MMTT/TPE/TC/FT)

Lectures	:	2 Hour / Week.
Drawing Practical	:	2 Hours / Week.
Theory Paper	:	100 Marks, 3 Hours
Term Work	:	25 Marks.
Subject Total	:	125 Marks.

1. Introduction and use of instruments - Line - Lettering - I.S. conventions for External and Internal Threads, Bearing, Gears, Knurling, end of shaft. I.S. conventions for various materials.
2. Orthographic Projections - General Principles - First angle method - Third Angle method - Dimensioning.
3. Sectional Orthographic Views: Cutting plane - Types of sections. Making sectional drawings of machine components.
4. Isometric Projections: Principle, Isometric scale, Isometric views, Making Isometric drawings of simple objects from orthographic views.
5. Development of Surfaces : A) Introduction to solids (Types of solids only) B) Development of lateral surfaces of cubes, prisms, cylinders, pyramids.
6. Free hand sketches: Making free hand sketches of -
 - i. Mechanisms in textile machines – Picking motion mechanism, Let-off motion mechanism, Take-up motion mechanism, Three blade beater, Immersion roller drive in sizing plaiting mechanism, Sewing needle, Throat plate, Sewing machine table, Cutting machine parts
7. Introduction to 'Auto-Cad' - Commands for drawing lines, circles, polygons.

TERM WORK:- Submission of 08 drawing sheets of half imperial size, on the following topics:

- a) Conversion of pictorial view into orthographic projects.
- b) Conversion of pictorial view into sectional orthographic projections.
- c) Isometric projections.
- d) Development of surfaces.
- e) Free hand sketches of I.S. conventions for threaded parts, khurling, materials etc.
- f) Free hand sketches of Textile machines mechanisms.

Reference Books:-

1. Engineering Drawing by N.D. Bhat.
2. The Fundamental of Engineering Drawing & Graphic Technology by French & Virek
3. I.S.: 696 (1972) Code of Practice for General Engineering Drawing by I.S.I, New Delhi.
4. Machine Drawing by N.D. Bhat.
5. Engineering Graphics by Narayana K.L. & Kannaiah P.
6. Principles of Weaving by Marks & Robinson.
7. Engineering Drawing by Venugopal.

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2.3 GENERAL ENGINEERING (TPE)

Lectures	:	3 Hours / Week.
Practical	:	3 Hours / Week.
Theory Paper	:	100 Marks, 3 Hours.
Term Work	:	25 Marks.
Subject Total	:	125 Marks.

1. Pattern Making: Basic instructions in connection with pattern making - Pattern material - Selection - Design consideration of pattern - Types of pattern - colour codification - Master Pattern.
2. Moulding & Core Making: Moulding material, Moulding sand classification - Properties & Sand Testing - Sand Preparation & Conditioning - Moulding Methods - Bench moulding, Floor moulding, Pit moulding - Shell moulding - CO₂ moulding.
Core Making - core - use, core material, types of cores, core boxes - core making.
3. Foundry: Cuplola Furnace, Induction Furnaces, Foundry processes - A) Sand Mould Casting - Melting - pouring - cooling of molten metal - cleaning of casting - casting defects. B) Special Casting processes – Die casting (Cold chamber, Hot Chamber), Centrifugal Casting - Types
4. Machine Tools:
 - I. Lathe - principle, important operations, Job holding devices, Tool holding devices, capstan & Turret lathe.
 - II. Milling Machine: Principle - Types, Up milling - Dawn milling & various operations performed.
 - III. Drilling Machine: Principle - Types - comparison between operations like Drilling, Reaming, Boring.
5. Welding: Principle, equipment & procedure of Gas & Arc welding, Brazing.

List of Experiments:-

1. Practical work relating to Mechanical workshop practice. Introduction to equipments & tools in pattern making, metal turning.
2. Each student has to prepare minimum two jobs in the following trades.
 - a. Pattern Making (carpentry)
 - b. Metal Turning.
3. Demonstration of welding.

Reference Books:

1. Foundry Technology - Sinha & Goyal.
2. Workshop Technology - Raghuwanshi.
3. Workshop Technology - Hajara-Choudhary.
4. Production Technology - P.C. Sharma.

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2.5 YARN MANUFACTURING MACHINERY- I (TPE)

Lectures	:	4 Hours / Week.
Practicals	:	2 Hours / Week
Theory Paper	:	100 Marks, 3 Hours.
Term Work	:	50 Marks
Subject Total	:	150 Marks.

1. Cotton Growing & Harvesting in India:-

- Indian Cotton Scenario
- Indian cotton growing regions
- Development in Indian Cottons
- Indian Cotton varieties and their properties
- Some foreign Cottons and their properties

2. Cotton Ginning :-

- Introduction to ginning operation
- Ginning objects
- Constructional details of different types of gins used for various types of cottons
- Pre and post ginning equipments- functions and working. Pre and post ginning machine lay out in ginning factory.
- Factors affecting ginning performance:-

Methods used for cotton harvesting - Seed cotton moisture content - Feed rate - Fibre attachment to seed (fibre pulling force) -Storage & transportation (No. of storage days, Transportation methods used in foreign countries and India) - Atmospheric conditions – Effect of ginning machine conditions on its working performance – effect of static electricity generation - conditioning equipments and its effect.

- Effect of ginning on fibre , yarn and fabric properties

Machine used at Pre- ginning -Ginning machinery condition -Type of gin machine used -Influence of saw-gin parameters on machine performance (seed cotton feed rate, Ginning speed & Seed cotton density)- Influence of setting & speeds on Roller ginning machine performance-Lint cleaners number of machines used and its effect.

- Factors affecting ginning performance
- Pressing and bailing of cotton
- Characteristics of bales of various countries

3. Blow room :-

Objects of blow room, Construction of components of blow room machines, Zone wise machines used in blow room, Construction of conventional blow room machines like bale breaker, hopper feeder, step cleaner, porcupine opener, Creighton opener, scutcher with bladed / krishner beaters. Reasons for constructional developments in blow room machinery, Research findings for modern developments in blow room.

Constructional details of modern blow room machines.

- Automatic bale opener
- Mild openers– Maxi-flow/ Uni-clean/Vario-clean
- Blenders
- Fine openers, cleanomat, flexiclean

Material transport system in modern blow room, Waste removal arrangement, Dust removal, Contamination removing machines, Utilities required for blow room machines – Electricity – Compressed air, Humidification in blow room, Waste recycling machines, Fire protection / Safety arrangements in blow room.

List of Experiments:-

1. Constructional study of Bale Opening machine - Dimensions, Driving arrangement and speed calculations.
Study of effect of different setting between Inclined spike lattice & Evener roller, Evener to Stripper, Grid bar to Beater on waste quality.
2. Constructional study of Coarse cleaning machines. Dimension, Driving arrangement, calculations.
Demonstration of different setting like Grid bar, Baffle Plate.
Cleaning efficiency calculation.
3. Constructional details of mixing machine. Dimension, Driving arrangement, calculations.
Mill visit, e. g. Unimix or Multimixer.

4. Study of Fine cleaning machine – Construction, Dimension, Driving arrangement, calculations. Demonstration of different setting like deflector plate. , ERM (Fine opener)
5. Study of De-dusting machines – Machine positioning, Working, Dimension, Driving arrangement, calculations.
6. Study of chute feed system. Constructional details, Demonstrations and setting of feed batt weight (gm/mt)
- 7 Calculation of cleaning efficiency of mild & intensive cleaner machines in blow room.
- 8 Mill visit to study the material flow and working of blow room.
- 9 Mill visit of ginning factory.
- 10 Constructional study of pre & post ginning machines.
- 11 Study of ginning machine – Construction, Dimension, Working, Driving arrangement and speed calculations.

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 Opening and Picking' by G.R. Merril.
- 6) 'Cotton Ginning' Textile Progress, The Textile Institute Publication.
- 7) 'Fundamentals of Spun Yarn Technology' by Carl A. Lawrence
- 8) 'Cotton Growing and Marketing', J.S. Parmar, Tecoya Trend Publications.
- 9) 'Cotton Varieties' by Parmar, Tecoya Trend Publication.
- 10) Blowroom and Carding- Training Programme conducted by NCUTE, IIT, Delhi.
- 11) Essential calculations of practical cotton spinning by T.K. Pattabhiraman.
- 12) 'Mixing & Blowroom' -by Prof.A.R.Khare.
- 13) Advances in technology of yarn production-NCUTE
- 14) Rieter Machine Manuals

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2.6 FABRIC MANUFACTURING MACHINERY - I (TPE)

Lectures	:	4 Hours / Week.
Practicals	:	2 Hours / Week
Theory Paper	:	100 Marks, 3 Hours.
Term Work	:	50 Marks
Subject Total	:	150 Marks.

I) WARPING

1. Need, Objectives, precautions to be considered in the process, classification of warping process- (beam warping, sectional warping, ball warping)
2. Warping machine: - construction and working: -
 - a. Creel: - framing (requirements, length, height, pitch, etc,) pegs, tensioning arrangements guides, blow fan, types of creels (parallel, V, V-nose etc.)
 - b. Principles of operation of beam warping and sectional warping.
 - c. Head stock: - Leasing reeds, Drum, speed, stop-motion, brake, comb, beam pressing, beam handling, set length, drums for sectional warping, its geometrical aspects, traverse, section width and sections, beaming process and speed.
 - d. Calculations: -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.

II) SIZING

1. Need: Objectives (abrasion resistance, strength, smoothness, lubrication, fiber lay etc), achieving the objectives through size paste constituents size application.
2. Concepts of sizing process: hank sizing, ball warp sizing, slasher sizing, and classification of sizing machines.
3. 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.
4. Head stock: - various functions in head stock, their importance in weaving (dry splitting, measuring, marking, winding, beam pressing etc)

5. Moisture and stretch: - Importance and their control
6. Ingredients-Types (natural, synthetic), their functions, examples, features.
7. Size cooking: - need, equipments available, method of addition of ingredients and its importance, gelatinizing, bursting, homogenizing, concentration, viscosity, (measuring methods and importance)
8. Calculations: -Production and efficiency of machine.

II) WEAVING

1. Study of dobby: Keighly, cam dobby, paper pattern, cross border dobby, method of pegging, heald reversing motions, Keighly dobby settings
2. Study of Jacquard: Parts of jacquards, sizes and figuring capacities of jacquard, harness ties, design ties, casting out, card cutting and lacing, Double lift single cylinder, Double lift double cylinder, cross border jacquards, high pitch jacquards.
3. Weft patterning: - Eccle's and Zang's drop box motions, pattern chain, card saving, fabric defects.

IV) FABRIC STRUCTURE

1. To represent following weaves on graph paper with design, draft, peg-plan and denting order.
 - a. Derivative of plain weave-warp and weft rib, matt (regular and irregular)
 - b. Derivatives of twill: pointed, herringbone, various types of diagonals, different types of broken and rearranged twills, transposed twill, twill checks, curved twills, combined twill, diamond, twist and twill interaction
 - c. Derivatives of satin/sateen weave, irregular satin, satin checks.
 - d. Toweling structures: Ordinary and brightened honeycomb, huckaback.
 - e. Mock leno, crepes by various methods.
2. The requirements of weaving for all above mentioned constructions, practical aspects of weaving, fabric and weave characteristics and properties of fabric and their applications.
3. Constructional details, characteristics and properties of following fabrics.

Poplin, long cloth, semi and full voile, cambric, denim, dhoti, sari, sheeting, shirting, suiting, gabardine, dress material.

List of Experiments:-

1. Study of Auxiliary motions – construction, working and functions of various parts in each system.
2. Study, dismantling and resetting of side weft fork motion.
3. Study, dismantling and resetting of Keighley dobbie.
4. Study, dismantling and resetting of Cam dobbie.
5. Weaving of fabric on dobbie by pegging and card cutting.
6. Study of mechanical jacquard and fabric weaving by card cutting for four picks.
7. Study, dismantling and resetting of drop box mechanism.
8. Study of sectional warping machine details and beam preparation.
9. Study of Automatic pirn winding machine, preparation of pirns with different diameter and bunch length.
10. Fabric Analysis of Mock Leno, Honey Comb.
11. Fabric Analysis of huck-a back.
12. Visit to warping and sizing unit

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 Mechanism by Chakraborty.
6. Weaving Mechanism by N.M. Banerjee.
7. Weaving by BTRA.
8. Fancy Weaving by K.T. Aswani.
9. Textile colour and design by Watson.
10. Woven cloth construction by Marks and Robinson.
11. Winding and Warping by M.K. Talukdar.
12. Yarn Preparation by Mr. Sengupta.
13. Weaving Technology & Operations by Ormerod

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2.7 COMPUTER LABORATORY (TPE/TC)

Practical	:	2 Hours/week
Term Work	:	50 Marks
Subject Total	:	50 Marks

1. Computer Fundamental :-

Basic organization of computer & its functional unit, Memories, System Software, Application Software.

2. 'C' Programming:-

Introduction, Algorithm & flowchart, keywords, statements, Loops.

3. Array:-

Introduction, Array representation, one dimensional array, two dimensional arrays.

4. Structure:-

Introduction, define structure, define structure variable, accessing structure member, array of structure, union.

5. Pointer:-

Introduction, application of pointer, pointer arithmetic, pointer & array.

6. Introduction of 'C++' programming:-

Basic concept of OOP, Application of OOP & C++, characteristic of OOP language.

7. Classe & Object:-

Class type, Data member, Member function, Constructor, Destructor.

8. Function in 'C++':-

Function prototype, inline function, friend function.

9. Inheritance:-

Basic Concept of inheritance, types of inheritance, Virtual function.

Term Work (Minimum 12 Program)

List of Experiments:-

1. One programs each on Loops, Array, Structure, Pointer, Union.
2. Class & Object
3. Constuctor & Destrucure
4. Function
5. Inheritance & virtual function.

Reference Books:-

1. C++ Programming- Robert Lafore
2. Let us C – Yashwant Kanitkar.
3. Let C++ - Yashwant Kanitkar
4. Fundamental of computer- Rajaraman