



REVISED SYLLABUS W.E.F.01ST JULY, 2010											
F.Y. B.TEXT. (FT) 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	FT	COMMUNICATION SKILLS	4	---	---	---	100	50	---	---	150
1.6	FT	INTRODUCTION TO TEXTILE MANUFACTURING-I	4	---	---	4	100	50	---	---	150
1.7	TT/MM/FT	COMPUTER 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. (FT) 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	FT	ELEMENTS OF FASHION DESIGN	3	---	3	--	100	25	---	---	125
2.4	TT/MMTT/TPE/TC/FT	ENGINEERING GRAPHICS	2	---	2	---	100	25	---	---	125
2.5	FT	INTRODUCTION TO TEXTILE MANUFACTURING-II	4	---	---	2	100	50	---	---	150
2.6	FT	TESTING OF FIBRES AND YARNS	4	---	---	2	100	50	---	---	150
2.7	FT	ADVANCED COMPUTER LABORATORY	---	---	---	2	---	50	---	---	50
			19	---	5	6	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  $Y$ ,  $\eta$  and  $K$ . Poission's ratio, relation between  $Y$ ,  $k$  and Poission's ratio and the relation between  $Y$ ,  $\eta$  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  $\eta$  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,  $\theta$  (Theta) is the angle of friction,  $\mu$  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**

**1.7 COMPUTER LABORATORY (TT/MMTT/FT)**

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

**FIRST YEAR B. TEXT. – SEMESTER - I**

**1.5 COMMUNICATION SKILLS (FT)**

Lecturers	:	4 Hours/week
Theory Paper	:	100 Marks.
Term Work	:	50 Marks
Subject Total	:	150 Marks

- I) Background for Effective Business Communication**  
Importance and benefits of effective communication – Components of communication – Concepts and Problems of Communication – Non verbal communication – The seven Cs of effective communication.
- II) Business communication in context and the ethical context.**  
Background to intercultural communication – National cultural variables – Individual cultural variables – Background to ethical contexts – Influences on personal ethics – Communication and ethical issues – Business communication and the technology context.
- III) Message Design**  
The process of preparing effective business messages – The appearance and design of business messages – Good news and neutral messages.
- IV) Written Communication**  
Business letters – The letter of enquiries & replies – Order, complaint & their reply – Invitation letters and its reply – Techniques of report writing. – Types of report writing – Investigation, survey, inspection report.
- V) Strategies for Oral Communication**  
Strategies for successful speaking and successful listening – Strategies for successful informative and persuasive speaking – Interpersonal communication – Strategies for successful business and group meetings, interviews, group discussion, debate, elocution, impromptu extempore
- VI) Phonetics**  
International phonetic alphabets – Stress – Transcription

**VII) Grammar and Vocabulary**

Noun, Pronoun – Adjectives and comparative adjectives – Adverbs – Gerunds – Preposition – Voice – Tenses – Direct & Indirect speeches – Clauses. – Use of phrases and Idioms – Synonyms – Antonyms, affixes – Homonyms – Homophones – Hyponyms

**VIII) The job application process.**

The job application process – The written job presentation \_ Interviews and follow up.

**Term Work:-**

- ❖ Formal Speech on Following Topics
  - a) About My Self
  - b) The problems I Face while communicating.
  - c) Topics on current affairs.
- ❖ Group Discussion on Current topics
- ❖ Vocabulary exercise – Synonyms, Antonyms, Phrases Idioms
- ❖ Language Lab sessions on phonetics and grammar.
- ❖ Games on team building, communication, public speaking.
- ❖ Exercises of summarizing English articles and news.

**Reference Books:-**

- 1) Effective Business Communication – H. A. Murphy, H. W. Hildebrandt, Jane P Thomas – Tata MC graw Hill Publishing Company Ltd., New Delhi.
- 2) Basic Business communication – Robert Ma Arches
- 3) Business English & Communication – Cleark
- 4) Business Communication – Pradhan and Thakur
- 5) Business Communication – Balsubramanium M.
- 6) Communication Techniques and Skills – R. K. Chaddha – Dhanpat Rai Publication, New Delhi.
- 7) Professional Communication Skills – Pravil S. R. Bhatia – S. Chand and Co. New Delhi.
- 8) Better English Pronunciation – J. D. O Connor
- 9) High School English Grammar & Composition – Wren and Martin – S. Chand & Co. New Delhi.
- 10) Communication Skills for Engineers – Sunita Mishra C. Muralikrishna – Pearson Education.
- 11) Principles and Practice of Business Communicatin – ASPi Doctor – Rhoda Doctor – Sheth publications, Mumbai.

**FIRST YEAR B. TEXT. – SEMESTER - I**

**1.6 INTRODUCTION TO TEXTILE MANUFACTURING-I (FT)**

Lecturers	:	4 Hours/week
Practicals	:	4 Hours/week
Theory Paper	:	100 Marks.
Term Work	:	50 Marks
Subject Total	:	150 Marks

**Yarn Forming:-**

- 1) Definition of Terms – Textile, fibres, yarns & fabrics. Flow chart of process involved in conversion of fibres into yarns by presently available methods object of each process. Brief introduction of different methods of spinning.
- 2) Yarn classification, yarn numbering system and related calculations.
- 3) Ginning – Purpose, types of ginner, pressing & baling of cotton.
- 4) Objects of blowroom, card, drawframe, speedframe, combing & passage of material through above machines.
- 5) Spinning – objects of ring spinning, functioning of ring spinning.
- 6) Structure & properties of yarn obtained from different systems of yarn forming.

**Fabric Forming:-**

- 1) Introduction to Textile Industry.
- 2) Process flow chart for conversion of yarns into woven fabrics, knitted fabric and non-wovens.
- 3) Yarn preparation – objects of winding, warping, sizing & drawing-in pirn winding, demonstration of machines to show how the objectives are achieved, passage of yarn on each machines & brief description of how the objectives are achieved.
- 4) Fabric forming – classification of looms, drop box, dobbie, jacquard loom & their purpose.
- 5) Demonstration & brief description of mechanism of non automatic powerlooms such as shedding, picking, beatup, let-off & take-up warp protector & weft stop motion.
- 6) Calculations – warp weight, weft weight, fabric weight in gm/sq.m. fabric production / loom.

- 7) Cloth Structures –
- a) Constructional details – warp / weft count, thread densities, width, length, selvages, light, medium & heavy constructions, capability of weaving machine to weave different constructions, warp & weft cover, cloth cover, crimp, contraction in warp & weft way. Introduction to interlacement of thread.
  - b) Presentation of weaves, design, draft, peg plan, denting plan, need & importance.
  - c) Study of weaves – plain, twill & satin (basics only).

**List of Experiments:-**

1. Study of instruments / tools, used in spinning & weaving.
2. To study the different types of drives & calculation based on the same.
3. Introduction to spinning, sequence, machines (carded / combed).
4. Study of passage of material through blow room.
5. To study the passage of material in carding & drawframe.
6. To study the passage of material in comber & its preparatory.
7. To study the passage of material through speedframe & ringframe.
8. Study of all weaving processes to observe the machines & operation to understand objects of all processes.
9. To study the primary motions to understand their functioning & objectives.
10. To study the secondary motions to understand their functioning & objectives.
11. To study the auxiliary motions to understand their functioning & objectives.
12. To study the object & method of fabric analysis and calculation of crimp, covers & fabric weight.
13. Fabric analysis of fabric samples with plain, twill & satin & sateen weaves.

**Reference Books:-**

- 1) Principles of Weaving by Marks A.T.C. & Robinson.
- 2) Textile Colour & Design by Watson.
- 3) Weaving by Prof. D.B. Ajgaonkar, Prof. Sriramalu, Prof. M.K. Talukdar.
- 4) Weaving by N.N. Banerjee.
- 5) Weaving Calculation by Sengupta.
- 6) Winding & Warping by M.K. Talukdar.

- 7) Winding, Warping and Weaving by A.R. Garde.
- 8) Fundamentals of Spun Yarn Technology by Carl A Lawrence.
- 9) Cotton Ginning, Textile Progress, The Textile Institute Publication.
- 10) Blowroom and Carding – Training Programme Conducted by NCUTE, IIT, Delhi.
- 11) Technology of Cotton Spinning by J. Janakiraman.
- 12) Blowroom Carding, Drawframe by Prof. A.R. Khare.
- 13) Essential Calculations of Practical Cotton Spinning by T.K. Pattabhiraman.
- 14) Introduction of Textile Fibres by Dr. H.V.S. Murthy.

**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 ( $\chi^2$ ) : Definition & properties only.

t-probability distribution: Definition & properties only.

F-probability distribution: Definition & properties only.

Examples of t,  $\chi^2$ , & 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.

**FIRST YEAR B. TEXT. – SEMESTER - II**

**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.

**FIRST YEAR B. TEXT. – SEMSTER II**

**2.3 ELEMENTS OF FASHION DESIGN (FT)**

Lectures	:	3 hrs/week
Drawing Practicals	:	3 hrs/week
Theory Paper	:	100 marks
Term Work	:	25 marks
Subject Total	:	125 marks

1. Introduction to the elements of Design: Point, Line, Shape, Direction, Texture, Color, Value
2. Point – The perspective of vanishing point and starting point.  
Line - To define Line, Shape, Contour & Outline to continuity and movement.
3. Shapes – Organic & Geometric shapes, positive shape creating a negative shape.  
Direction - Horizontal, Vertical or Oblique. Suggestion of directions or feeling provided by the different directions.
4. Texture – Surface quality, Visual Texture, Physical texture. The meaning of texture.  
Color – The difference between primary, secondary and tertiary colors, mixing of colors. Saturation, warm & cool colors, color schemes.  
Value – darkness or lightness of a color, diluting a color to get different hue.
5. Introduction to the principles of design: Balance, rhythm, proportion, emphasis, unity.
6. Balance – Equilibrium resulting from looking at images and judging them against our ideas of physical structure. Symmetrical and asymmetrical balance.  
Rhythm - repetition or alternation of elements, often with defined intervals between them. Rhythm creating a sense of movement, and establishing pattern and texture.
7. Proportion - the comparison of dimensions or distribution of forms. relationship in scale between one element and another, or between a whole object and one of its parts.
8. Emphasis - varying degrees of dominance in design. visual weight of a composition, establishes space and perspective.

9. Unity - the aspects of a given design that are necessary to tie the composition together, to give it a sense of wholeness, or to break it apart and give it a sense of variety.
10. Mobility and concentration – Mobility in a design and concentration in a composition.  
Space – The concept of positive and negative space and showing the positive and negative space with the help of compositions.
11. Emotions: Showing emotions with the help of elements & principles of design.
12. Introduction to basic drawing – Tools and materials, perspective, drawing with a grid, drawing basic shapes.
13. Eight head theory of body measurements, 10 – head theory of body measurements, 12 – head theory of body measurements.
14. Introduction to landscapes – Landscape compositions, perspectives, drawing simple landscapes
15. Introduction to people - From the subtleties of emotion conveyed by facial expressions, learning shading techniques that can bring life to portraits.

**List of Experiments:-**

1. Drawing of Horizontal, Vertical, Diagonal, Spiral, zig-zag lines on sketch book.
2. Make a composition using Line, Shape, Contour & Outline to show continuity and movement
3. Make different colors, mix primary colors to get secondary colors and make 20 tones of each color.
4. Make 5 Visual textures and 5 Physical textures using any natural material and colors.
5. Draw 5 each of abstract, organic and geometric shapes free-hand.
6. Make compositions to show a feeling of balance, formality and alertness using 20 lines, 5 circles and 10 rectangles.
7. Draw regular, flowing and progressive compositions to get a sense of movement.
8. Design 3 compositions each on positive and negative space, mobility and concentration.
9. Drawing of human body with the help of 8 head theory of body measurements.

10. Make a composition based on the elements and principles of design using 64 cubes of size 1X1” and using colors, texture and theme-based on the given 4 lines of poetry.

**Reference Books:**

1. The Elements of Design, *Rediscovering Colours, Textures, Forms and Shapes*, Loan Oei, Cecile De Kegel, ISBN 0500283397.
2. The art of basic drawing, Walter Foster Publishing Inc.
3. Elements of Design: Structure of Visual Relationships, by Gail Greet Hannah
4. Principles of Three-Dimensional Design: Objects, Space and Meaning, Stephen Luecking
5. Universal Principles of Design, by William Lidwell, Rock port publications.

**FIRST YEAR B. TEXT. – SEMESTER – II**

**2.5 INTRODUCTION TO TEXTILE MANUFACTURING – II (FT)**

Lecturers	:	4 Hours/week
Practical	:	2 Hours/week
Theory Paper	:	100 Marks.
Term Work	:	50 Marks
Subject Total	:	150 Marks

1. Doubling and Twisting - Objects, properties and applications of doubled yarns, various doubling & twisting methods (Ring doubler, Uptwister and TFO).
2. Introduction to principle of working of Rotor spinning, Airjet spinning, Vortex spinning, Compact spinning and Friction spinning.
3. Blend Yarns – Objects of blending of different fibres, concept of blend spinning. Properties and application of blended yarns.
4. Weft patterning – Study of systems available, types of box motions, introduction to Weft patterning on modern weaving machines, card saving
5. Tore present following weaves on graph paper with design, draft, per plan and dealing order.
  - a. Derivative of plain weave, warp and welt rib matt (regular and irregular)
  - b. Derivatives trill – Pointed, herringbone, various types of diagonals, different types of broken and rearranged trills, transposed trill, trill chocks, curved trills, combined trill, diamond, twist and trill interaction.
  - c. Derivatives of satin / sateen weave irregular satin, satin cheeks.
  - d. Toweling structures, ordinary and Brighton Honeycombs, Huckaback.
  - e. Mock leno, Creps by Various methods.
6. The requirements of weaving for all above mentioned constructions, practical aspects of weaving, fabric and weave characteristics and properties of fabric and their applications.
7. 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.
8. Need for chemical processing of textiles – Important unit processes involved in conversion of gray fabric to finished fabric. Object of each processes such as desiring, scouring, bleaching, mercerization, dyeing, printing and finishing.
9. Introduction to Garment processing.

**List of Experiments:-**

1. Study of Ring doubler – Passage and calculations.
2. Study of construction and passage of material on rotor spinning.
3. Study of construction and passage of material on airjet spinning.
4. Operating the plain and auto loom to weave the good fabric.
5. To study different fabric defects.
6. Fabric Analysis (Derivatives of plain : Warp Rib, Welt Rib, Matt weave)
7. Fabric Analysis ( Trill derivatives : Broken, Transposed, Herringbone)
8. Fabric Analysis ( Satin and Sateen)
9. Fabric Analysis (Mack leno, Honeycomb, Huckaback.
10. Study of important processing operations.
11. Study of various finishes used for textiles.
12. Mill Visit.

**Reference Books:-**

1. The textile Institute publication – Manual of Textile Technology – Short Staple Spinning series.  
Vol. V: New Spinning System by W. Klein.  
Vol. I: The Technology of Short Staple Spinning by W. Klein.
2. Essential Calculations of practical cotton spinning by T. K. Pattabhirerman.
3. Elements of Ring frame and doubling by A. R. Khare.
4. Spun Yarn Technology by Eric Oxtoby.
5. TFO Technology and Technique for spun yarn by M. S. Kulkarni and H. V. S. Murthy.
6. Fundamentals of Spun Yarn Technology By Carl A. Lawrence.
7. Principles of Weaving by Marks ATC and Robinson.
8. Textile Color and design by Watson.
9. Weaving by Prof. D. B. Ajgaonkar, Prof. Sriramalar & M. K. Takddar
10. Weaving Mechanism by K. T. Aswani.
11. Pretreatment of Cotton fabrics by R. S. Prayag.
12. Technology of Textile Processing by Prof. V. A. Shenai.

**FIRST YEAR B. TEXT. – SEMESTER – II**

**2.6 TESTING OF FIBRES AND YARNS (FT)**

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

**FIBRE TESTING:-**

- 1. Sampling for determination of fibre properties:-** Importance, General requirements – Random sample, Biased sample, Numerical and Length biased samples – Extent bias, Avoidance of extent bias, Sampling techniques – Squaring method, Cut square method, Zoning technique.
- 2. Longitudinal dimensions (Fibre Length):-** Technical significance of fibre length, Fibre length measurement – Hand Stapling, Oil plate method, Comb sorter method, Digital Fibrograph.
- 3. Transverse Dimensions (Fineness & Maturity):-**
  - i. Fineness** – Terms & Definitions, Technical significance of fibre fineness, Measures of fibre fineness, Measurement of fineness – Micrometric method, Gravimetric method, Airflow method, Vibroscope method
  - ii. Maturity of cotton** - Technical significance, Measures of maturity, Methods of measurement –Microscope Method, Differential dyeing method, Polarized light method
- 4. Fibre Strength:** - Importance, terminology, Stress-strain curve & its importance, Factors influencing fibre strength, Measurement of fibre strength: – Single fibre strength – Instron, Bundle strength – Stelometer.
- 5. Modern Testing Instruments:** - HVI & AFIS.
- 6. Neps:** - Definition, Importance, Testing of Neps in card web by Shirley Template Method.
- 7. Identification of Fibres:-** Cotton, Wool, Silk, Viscose Rayon, Nylon, Polyester & Acrylic fibre, Solubility test, Burning test, Cross sectional & Longitudinal views of fibres.

**8. Linear density of yarn:** - Count or Yarn number, Direct & Indirect system of yarn numbering, Measurement of yarn number.

**9. Twist & Twist Measurement:-** Definition, Twist Direction, Amount of Twist, Twist multiplier / factor, Functions of twist on yarn properties, Effect of twist in yarn on fabric properties, Measurement of twist – Untwist and Twist method, Take-up Twist Tester.

**10. Yarn Strength:-**

**a) Single Thread Strength :-** Effect of fibre properties on yarn strength, factors affecting tensile properties of textiles, Different principles of Tensile Testing, Pendulum lever principle, Strain gauge transducer principle, Machines working on these principles.

**b) Lea Strength:** - Lea CSP or Break factor & its significance, Description of Lea Strength tester. Comparison of Lea & Single thread strength test results

**c) Ballistic Strength :-** Principle, Measurement of Ballistic Strength

**11. Evenness of Yarn:-** Classification of Variations, Expressions of irregularity, Basic irregularity, Index of irregularity, Measurement of yarn irregularities – Visual examination, Electronic capacitance principle, Spectrogram analysis, Causes of irregularity, Importance of irregularity, Imperfections & Classimat faults, Principle & working of Uster Classimat

**12. Hairiness in spun yarn:** - Causes & Control of Yarn Hairiness, Measurement of yarn hairiness.

**List of Experiments:-**

1. Identification of Textile fibres by Microscopy Method.
2. Fibre maturity measurement by Caustic Soda (NaOH method)
3. Fibre fineness by Cut – Weight Method.
4. Measurement of micronaire value by airflow instrument.
5. Determination of fibre parameters by HVI.
6. Determination of fibre parameters by AFIS.
7. Determination of yarn number & its variation.
8. Determination of Twist in Single & Double Yarn.
9. Determination of Single Thread Strength

10. Determination of Lea Strength & Ballistic Strength.
11. Determination of yarn evenness by Capacitance principle.

**Reference Books:-**

1. Textile Testing by Angappan & Gopal Krishnan
2. Physical Testing of Textiles by J. E. Booth.
3. Physical properties of Textile fibres by Morton & Hearle
4. Textile Testing by Skinkle.
5. Handbook of Indian Standards.

**FIRST YEAR B. TEXT. – SEMESTER – II**

**2.7 ADVANCED COMPUTER LABORATORY (FT)**

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

1. Introduction to CorelDraw X4. The Corel Draw X4 Workplace. Setting up document page, saving and opening documents. Use of rulers and margins. Zooming and navigating the work area.
2. The toolbars available in CorelDraw, working with toolbars to create basic shapes. Uses of pen tools, Bezier tool, break paths, combine objects, drawing arcs with 3-point curve tool, grouping and ungrouping objects.
3. Cloning objects using the duplicate command, control layer properties, typography rules and conventions. Creating your own fonts. Filling objects with color outline. Envelope and distortion effects & blend and contour effects.
4. Working with Dockers, nested Dockers, mirror, rotate and duplicate with the help of Dockers. Using the interactive extrude tool, setting extrusion shapes. Raw image color correction.
5. Lens effect and transparency, color add lens, heat map lens etc. Using the frozen action, remove face option, fountain fill transparency, Embellishments: Bevels, power clips and shadows, feathers, shadow as glow effects, working with perspectives.
6. Introduction to Adobe Photoshop CS4, getting to know the work area, opening a file, importing and exporting different file formats, selecting and using basic tools.
7. Basic photo corrections & modifications – adjusting image resolution and size, cropping and feathering an image, use of clone stamp tool, spot healing brush tool, select and deselect parts of an image.
8. Layer Basics – create, view, hide and select layers, apply blending mode to layers. Masks and channels – refining a selection using a quick mask, viewing a mask using the channels panel. Adjusting individual channels, advance layering, advance compositing.
9. Preparing files for the web – slicing an image, user slices and auto slices, defining rollovers, optimizing images for the web, preview animations in a web browser.

**List of Experiments:-**

1. Create rectangles, ellipse, spirals, flowers and other basic shapes using the toolbox.
2. Make your visiting card with the help of the toolbars available and color palettes.
3. Using transformation, artistic media and other basic tools, draw an aquarium with a 3D effect.
4. Using the available tools, draw a shirt with checks with the use of power clips and fill options.
5. Draw a T-shirt and print a design on it while also showing labels on it and one vertically written word on it.
6. Remove a color cast from an image using Auto Color correction.
7. With the given image, move and duplicate a selection simultaneously.
8. Using layers and color channels, make a collage in Photo Shop.
9. Using the available tools in photo shop and with the help of layers, design an invitation card for your college's fashion program.
10. Create a composition and publish it to the web, create animation sequences and preview the animations in a web browser.

**Reference Books:**

1. Art & Design in Photoshop, by Steve Caplin, Focal Press Publications.
2. Adobe Photoshop CS4 Classroom in a book, The official training workbook from Adobe Systems, Adobe Systems Incorporated.
3. Corel Draw X4 The Official Guide, by Gary David Bouton, Corel Press Officially endorsed by Corel Corporation.
4. Corel Draw X4 Unleashed, Foster D. Coburn, Premium Bonus Publications.