UNIVERSITY DEPARTMENTS

REGULATIONS 2012

CURRICULA AND SYLLABI FOR I TO VIII SEMESTERS

B.TECH. TEXTILE TECHNOLOGY (FULL TIME)
# ANNA UNIVERSITY:: CHENNAI 600 025

UNIVERSITY DEPARTMENT

R – 2012

B.TECH. TEXTILE TECHNOLOGY

I – VIII SEMESTERS CURRICULA AND SYLLABI

## SEMESTER I

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*Two weeks each at the end of IV and VI semester*
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**TOTAL NO. OF CREDITS : 176**
OBJECTIVES:

- To enable all students of engineering and technology develop their basic communication skills in English.
- To give special emphasis to the development of speaking skills amongst the students of engineering and technology students.
- To ensure that students use the electronic media such as internet and supplement the learning materials used in the classroom.
- To inculcate the habit of reading for pleasure.

UNIT I

Listening - Introducing learners to GIE - Types of listening - Listening to audio (verbal & sounds); Speaking - Speaking about one’s place, important festivals etc. – Introducing oneself, one’s family / friend; Reading - Skimming a reading passage – Scanning for specific information - Note-making; Writing - Free writing on any given topic (My favourite place / Hobbies / School life, etc.) - Sentence completion - Autobiographical writing (writing about one’s leisure time activities, hometown, etc.); Grammar - Prepositions - Reference words - Wh-questions - Tenses (Simple); Vocabulary - Word formation - Word expansion (root words / etymology); E-materials - Interactive exercises for Grammar & Vocabulary - Reading comprehension exercises - Listening to audio files and answering questions.

UNIT II

Listening - Listening and responding to video lectures / talks; Speaking - Describing a simple process (filling a form, etc.) - Asking & answering questions - Telephone skills – Telephone etiquette; Reading – Critical reading - Finding key information in a given text - Sifting facts from opinions; Writing - Biographical writing (place, people) - Lab descriptions (general/specific description of laboratory experiments) - Definitions - Recommendations; Grammar - Use of imperatives - Subject-verb agreement; Vocabulary - Compound words - Word Association; E-materials - Interactive exercises for Grammar and Vocabulary - Listening exercises with sample telephone conversations / lectures – Picture-based activities.

UNIT III

Listening - Listening to specific task - focused audio tracks; Speaking - Role-play – Simulation - Group interaction - Speaking in formal situations (teachers, officials, foreigners); Reading - Reading and interpreting visual material; Writing - Jumbled sentences - Coherence and cohesion in writing - Channel conversion (flowchart into process) - Types of paragraph (cause
& effect / compare & contrast / narrative / analytical) - Informal writing (letter/e-mail/blogs) - Paraphrasing; Grammar - Tenses (Past) - Use of sequence words - Adjectives; Vocabulary - Different forms and uses of words, Cause and effect words; E-materials - Interactive exercises for Grammar and Vocabulary - Excerpts from films related to the theme and follow up exercises - Pictures of flow charts and tables for interpretations.

UNIT IV
Listening - Watching videos / documentaries and responding to questions based on them; Speaking - Responding to questions - Different forms of interviews - Speaking at different types of interviews; Reading - Making inference from the reading passage - Predicting the content of a reading passage; Writing - Interpreting visual materials (line graphs, pie charts etc.) - Essay writing – Different types of essays; Grammar - Adverbs – Tenses – future time reference; Vocabulary - Single word substitutes - Use of abbreviations & acronyms; E-materials - Interactive exercises for Grammar and Vocabulary - Sample interviews - film scenes - dialogue writing.

UNIT V
Listening - Listening to different accents, Listening to Speeches/Presentations, Listening to broadcast & telecast from Radio & TV; Speaking - Giving impromptu talks, Making presentations on given topics; Reading - Email communication - Reading the attachment files having a poem/joke/proverb - Sending their responses through email Writing - Creative writing, Poster making; Grammar - Direct and indirect speech; Vocabulary - Lexical items (fixed / semi fixed expressions); E-materials - Interactive exercises for Grammar & Vocabulary - Sending emails with attachment – Audio / video excerpts of different accents, - Interpreting posters.

TOTAL : 60 PERIODS

TEXT BOOKS

REFERENCES

EXTENSIVE READERS

Website Resource
1. www.uefap.com
2. www.eslcafe.com
3. www.listen-to-english.com
4. www.owl.english.purdue.edu
5. www.chompchomp.com

MA8151 MATHEMATICS – I L T P C 3 1 0 4

OBJECTIVES:
1. To develop the use of matrix algebra techniques this is needed by engineers for practical applications.
2. To make the student knowledgeable in the area of infinite series and their convergence so that he/ she will be familiar with limitations of using infinite series approximations for solutions arising in mathematical modeling.
3. To familiarize the student with functions of several variables. This is needed in many branches of engineering.
4. To introduce the concepts of improper integrals, Gamma, Beta and Error functions which are needed in engineering applications.
5. To acquaint the student with mathematical tools needed in evaluating multiple integrals and their usage.

UNIT I MATRICES 9+3
Eigenvalues and Eigenvectors of a real matrix – Characteristic equation – Properties of eigenvalues and eigenvectors – Cayley-Hamilton Theorem – Diagonalization of matrices –
Reduction of a quadratic form to canonical form by orthogonal transformation – Nature of quadratic forms.

UNIT II INFINITE SERIES 9+3

UNIT III FUNCTIONS OF SEVERAL VARIABLES 9+3

UNIT IV IMPROPER INTEGRALS 9+3
Improper integrals of the first and second kind and their convergence – Evaluation of integrals involving a parameter by Leibnitz rule – Beta and Gamma functions – Properties – Evaluation of integrals using Beta and Gamma functions – Error functions

UNIT V MULTIPLE INTEGRALS 9+3

TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES

PH8151 ENGINEERING PHYSICS LTPC
(Common to all branches of B.E / B.Tech programmes) 3 0 0 3

OBJECTIVE:
To introduce the basic physics concepts relevant to different branches of Engineering and Technology.

UNIT I PROPERTIES OF MATTER 9

UNIT II ACOUSTICS AND ULTRASONICS 9

UNIT III THERMAL PHYSICS 9
and diesel engines and their efficiency - entropy - entropy of Carnot’s cycle - reverse Carnot’s cycle - refrigerator.

UNIT IV  APPLIED OPTICS

UNIT V  SOLID STATE PHYSICS
Nature of bonding - growth of single crystals (qualitative) - crystal systems - crystal planes and directions - expressions for interplanar distance - coordination number and packing factor for simple structures: SC, BCC, FCC and HCP - structure and significance of NaCl, ZnS, diamond and graphite - crystal imperfections: point defects, dislocations and stacking faults - unit cell, Bravais space lattices - miller indices.

TOTAL: 45 PERIODS

TEXT BOOKS

REFERENCE BOOKS

UNIT I  CHEMICAL THERMODYNAMICS
Second law: Entropy - entropy change for an ideal gas, reversible and irreversible processes; entropy of phase transitions; Clausius inequality. Free energy and work function: Helmholtz and Gibbs free energy functions; Criteria of spontaneity; Gibbs-Helmholtz equation; Clausius-Clapeyron equation; Maxwell relations – Van’t Hoff isotherm and isochore. Chemical potential; Gibbs-Duhem equation – variation of chemical potential with temperature and pressure.
UNIT II POLYMER CHEMISTRY

Introduction: Classification of polymers – Natural and Synthetic; Thermoplastic and Thermosetting. Functionality – Degree of polymerisation. Types and mechanism of polymerisation: Addition (Free Radical, cationic, anionic and living); condensation and copolymerisation. Properties of polymers: Tg, Tacticity, Molecular weight – weight average, number average and polydispersity index. Techniques of polymerisation: Bulk, emulsion, solution and suspension.

UNIT III KINETICS AND CATALYSIS


UNIT IV PHOTOCHEMISTRY AND SPECTROSCOPY


UNIT V NANOCHEMISTRY


TOTAL : 45 PERIODS

TEXT BOOKS

REFERENCES


GE8151 COMPUTING TECHNIQUES L T P C 3 0 0 3

UNIT I INTRODUCTION 8

UNIT II C PROGRAMMING BASICS 10

UNIT III ARRAYS AND STRINGS 9

UNIT IV FUNCTIONS AND POINTERS 9

UNIT V STRUCTURES AND UNIONS 9
Introduction – need for structure data type – structure definition – Structure declaration –
Structure within a structure - Union - Programs using structures and Unions – Storage classes, Pre-processor directives.

TOTAL : 45 PERIODS

TEXT BOOKS

REFERENCES

GE8152 ENGINEERING GRAPHICS

OBJECTIVES
• To develop in students, graphic skills for communication of concepts, ideas and design of engineering products
• To expose them to existing national standards related to technical drawings.

CONCEPTS AND CONVENTIONS (Not for Examination) 1
Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

UNIT I PLANE CURVES AND FREE HAND SKETCHING 5+9
Visualization concepts and Free Hand sketching: Visualization principles – Representation of Three Dimensional objects – Layout of views- Free hand sketching of multiple views from pictorial views of objects

UNIT II PROJECTION OF POINTS, LINES AND PLANE SURFACES 5+9
Orthographic projection- principles-Principal planes-First angle projection-projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and trapezoidal method and traces Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT III PROJECTION OF SOLIDS 5 + 9
Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes by rotating object method and auxiliary plane method.

UNIT IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES 5+9
Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids – Prisms, pyramids cylinders and cones. Development of lateral surfaces of solids with cut-outs and holes

UNIT V ISOMETRIC AND PERSPECTIVE PROJECTIONS 6 + 9
Principles of isometric projection – isometric scale – Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions and miscellaneous problems. Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method and vanishing point method.

COMPUTER AIDED DRAFTING (Demonstration Only) 3
Introduction to drafting packages and demonstration of their use.

TOTAL : 75 PERIODS

TEXT BOOK
REFERENCES

Publication of Bureau of Indian Standards:

Special points applicable to University Examinations on Engineering Graphics:
1. There will be five questions, each of either or type covering all units of the syllabus.
2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets of A3 size only.
4. The students will be permitted to use appropriate scale to fit solution within A3 size.
5. The examination will be conducted in appropriate sessions on the same day

PH8161 PHYSICS LABORATORY LTPC
(Common to all branches of B.E. / B.Tech. Programmes) 0 0 2 1

1. Torsional pendulum - Determination of rigidity modulus of wire and moment of inertia of disc
2. Non–uniform bending - Determination of young’s modulus
3. Lee’s disc - Determination of thermal conductivity of a bad conductor
4. Potentiometer – Determination of thermo e.m.f. of thermocouple
5. Air wedge – Determination of thickness of a thin sheet of paper
6. i. Optical fibre - Determination of Numerical Aperture and acceptance angle
   ii. Compact disc – Determination of width of the groove using laser
7. Acoustic grating - Determination of velocity of ultrasonic waves in liquids
8. Post office box – Determination of Band gap of a semiconductor
9. Spectrometer – Determination of wavelength using grating
10. Viscosity of liquids – Determination of co-efficient of viscosity of a liquid by Poiseuille’s flow

TOTAL: 30 PERIODS

CY8161 CHEMISTRY LABORATORY LTPC
(Common to all branches of Engineering and Technology) 0 0 2 1

1. Estimation of HCl using Na2CO3 as primary standard and Determination of alkalinity in water sample.
2. Determination of total, temporary & permanent hardness of water by EDTA method.
3. Determination of DO content of water sample by Winkler’s method.
4. Determination of chloride content of water sample by argentometric method.
5. Estimation of copper content of the given solution by lodometry.
6. Determination of strength of given hydrochloric acid using pH meter.
7. Determination of strength of acids in a mixture of acids using conductivity meter.
8. Estimation of iron content of the given solution using potentiometer.
9. Estimation of iron content of the water sample using spectrophotometer (1,10- phenanthroline / thiocyanate method).
10. Estimation of sodium and potassium present in water using flame photometer.
14. Determination of CMC.
15. Phase change in a solid.

TOTAL: 30 PERIODS
REFERENCES


GE8161 COMPUTER PRACTICES LABORATORY

LIST OF EXPERIMENTS:

1. Search, generate, manipulate data using MS office/ Open Office
2. Presentation and Visualization – graphs, charts, 2D, 3D
3. Problem formulation, Problem Solving and Flowcharts
4. C Programming using Simple statements and expressions
5. Scientific problem solving using decision making and looping.
6. Simple programming for one dimensional and two dimensional arrays.
7. Solving problems using String functions
8. Programs with user defined functions
9. Program using Recursive Function and conversion from given program to flow chart.
10. Program using structures and unions.

TOTAL : 45 PERIODS

GE8162 ENGINEERING PRACTICES LABORATORY

OBJECTIVE

To provide exposure to the students with hands-on experience on various basic engineering practices in Civil, Mechanical, Electrical and Electronics Engineering.
GROUP – A (CIVIL & ELECTRICAL)

1. CIVIL ENGINEERING PRACTICE

Plumbing
Basic pipe connections involving the fittings like valves, taps, coupling, unions, reducers, elbows and other components used in household fittings. Preparation of plumbing line sketches.

Laying pipe connection to the suction side of a pump – inlet.

Laying pipe connection to the delivery side of a pump – outlet.

Practice in mixed pipe connections: Metal, plastic and flexible pipes used in household appliances.

Wood Work
Sawing, planning and making common joints: T-Joint, Mortise and Tenon joint, Dovetail joint.

Study
Study of joints in door panels, wooden furniture
Study of common industrial trusses using models.

2. ELECTRICAL ENGINEERING PRACTICE

Basic household wiring using switches, fuse, indicator – lamp etc.,
Preparation of wiring diagrams
Stair case light wiring
Tube – light wiring
Study of iron-box, fan with regulator, emergency lamp

GROUP – B (MECHANICAL AND ELECTRONICS)

3. MECHANICAL ENGINEERING PRACTICE

Welding
Arc welding of butt joints, lap joints, tee joints
Gas welding Practice.
Basic Machining
Simple turning, drilling and tapping operations.
Machine assembly Practice.
Study and assembling the following:
Centrifugal pump, mixies and air conditioners.
Demonstration on
(a) Smithy operations like the production of hexagonal bolt.
(b) Foundry operation like mould preparation for grooved pulley.

4. ELECTRONIC ENGINEERING PRACTICE
Soldering simple electronic circuits and checking continuity.
Assembling electronic components on a small PCB and testing.
Study of Telephone, FM radio, low-voltage power supplies.

TOTAL: 45 PERIODS

HS8251 TECHNICAL ENGLISH - II L T P C
(For all branches of B.E / B.Tech programmes) 3 1 0 4

OBJECTIVES:
• To make the students acquire listening and speaking skills meant for both formal and informal contexts
• To help them develop their reading skills by exposing them to different types of reading strategies
• To equip them with writing skills needed for academic as well as workplace situations
• To make them acquire language skills at their own pace by using e-materials and language lab component

UNIT I
Listening - Listening to informal conversations and participating; Speaking - Opening a conversation (greetings, comments on something, weather) - Turn taking - Closing a conversation (excuses, general wish, positive comment, thanks); Reading - Developing analytical skills, Deductive and inductive reasoning - Extensive reading; Writing - Effective use of SMS for sending short notes and messages - Using 'emoticons' as symbols in email messages; Grammar - Regular & irregular verbs - Active and passive voice; Vocabulary - Homonyms (e.g. 'can') - Homophones (e.g. 'some', 'sum'); E-materials - Interactive exercise on Grammar and vocabulary – blogging; Language Lab - Listening to different types of conversation and answering questions.
UNIT II

Listening - Listening to situation based dialogues; Speaking - Conversation practice in real life situations, asking for directions (using polite expressions), giving directions (using imperative sentences), Purchasing goods from a shop, Discussing various aspects of a film (they have already seen) or a book (they have already read); Reading - Reading a short story or an article from newspaper, Critical reading, Comprehension skills; Writing - Writing a review / summary of a story / article, Personal letter (Inviting your friend to a function, congratulating someone for his success, thanking one’s friend / relatives); Grammar - modal verbs, Purpose expressions; Vocabulary - Phrasal verbs and their meanings, Using phrasal verbs in sentences; E-materials - Interactive exercise on Grammar and vocabulary, Extensive reading activity (reading stories / novels from links), Posting reviews in blogs - Language Lab - Dialogues (Fill up exercises), Recording students’ dialogues.

UNIT III

Listening - Listening to the conversation - Understanding the structure of conversations; Speaking - Conversation skills with a sense of stress, intonation, pronunciation and meaning - Seeking information — expressing feelings (affection, anger, regret etc.); Reading - Speed reading – reading passages with the time limit - Skimming; Writing - Minutes of meeting – format and practice in the preparation of minutes - Writing summary after reading the articles from the journals - Format for the journal articles – elements of technical articles (abstract, introduction, methodology, results, discussion, conclusion, appendices, references) - Writing strategies; Grammar - Conditional clauses - Cause and effect expressions; Vocabulary - Words used as nouns and verbs without any change in the spelling (e.g. ‘rock’, ‘train’, ‘ring’); E-materials - Interactive exercise on Grammar & vocabulary - Speed Reading practice exercises; Language Lab - Intonation practice using EFLU materials – Attending a meeting and writing minutes.

UNIT IV

Listening - Listening to a telephone conversation, Viewing a model interview (face-to-face, telephonic and video conferencing) and observing the practices; Speaking - Role play practice in telephone skills - listening and responding, -asking questions, -note taking – passing on messages, Role play and mock interview for grasping the interview skills; Reading - Reading the job advertisements and the profile of the company concerned – scanning; Writing - Applying for a job – cover letter - résumé preparation – vision, mission and goals of the candidate; Grammar - Numerical expressions - Connectives (discourse markers); Vocabulary - Idioms and their meanings – using idioms in sentences; E-materials - Interactive exercises on Grammar & Vocabulary - Different forms of résumés- Filling up a résumé / cover letter; Language Lab - Telephonic interview – recording the responses - e-résumé writing.
UNIT V

Listening - Viewing a model group discussion and reviewing the performance of each participant - Identifying the characteristics of a good listener; Speaking - Group discussion skills – initiating the discussion – exchanging suggestions and proposals – expressing dissent/agreement – assertiveness in expressing opinions – mind mapping technique; Reading - Note making skills – making notes from books, or any form of written materials - Intensive reading Writing - Types of reports – Feasibility / Project report – report format – recommendations / suggestions – interpretation of data (using charts for effective presentation); Grammar - Use of clauses; Vocabulary – Collocation; E-materials - Interactive grammar and vocabulary exercises - Sample GD - Pictures for discussion, Interactive grammar and vocabulary exercises - Pictures for discussion; Language Lab - Different models of group discussion

TOTAL: 60 PERIODS

TEXT BOOKS

REFERENCES

EXTENSIVE READERS

WEB RESOURCES
1. www.esl-lab.com
2. www.englishgrammar.org
OBJECTIVES

• To make the student acquire sound knowledge of techniques in solving ordinary differential equations that model engineering problems.

• To acquaint the student with the concepts of vector calculus needed for problems in all engineering disciplines.

• To develop an understanding of the standard techniques of complex variable theory so as to enable the student to apply them with confidence, in application areas such as heat conduction, elasticity, fluid dynamics and flow of electric current.

• To make the student appreciate the purpose of using transforms to create a new domain in which it is easier to handle the problem that is being investigated.

UNIT I DIFFERENTIAL EQUATIONS 9+3
Method of variation of parameters – Method of undetermined coefficients – Homogenous equation of Euler’s and Legendre’s type – System of simultaneous linear differential equations with constant coefficients.

UNIT II VECTOR CALCULUS 9+3
Gradient and directional derivative – Divergence and Curl – Irrotational and Solenoidal vector fields – Line integral over a plane curve – Surface integral and volume integral - Green’s, Gauss divergence and Stoke’s theorems – Verification and application in evaluating line, surface and volume integrals.

UNIT III ANALYTIC FUNCTION 9+3
Analytic functions – Necessary and sufficient conditions for analyticity - Properties – Harmonic conjugates – Construction of analytic function - Conformal mapping – Mapping by functions w= z+ c, az, 1/z, z2- Bilinear transformation.

UNIT IV COMPLEX INTEGRATION 9+3
Line integral - Cauchy’s integral theorem – Cauchy’s integral formula – Taylor’s and Laurent’s

UNIT V LAPLACE TRANSFORMS


TOTAL : 60 PERIODS

TEXT BOOKS

REFERENCES

PH8254 PHYSICS FOR TECHNOLOGISTS

UNIT I ATOMIC STRUCTURE AND ELECTRO MAGNETIC RADIATION

Study of Atomic Structure – Proton Neutron, and Electron; Radiation - photons and their wavelength energy relationship; The Dual nature of Particles and Radiation; The interaction of matter and radiation; The Crystal Lattice structure of matter; Tools to investigate structure - Electron generation – methods - their energy levels; X-ray generation – Composition – energy levels; Infra red radiation-molecular vibrations – mode and amplitude; Electromagnetic lenses – Magnification and focal length calculations.
UNIT II    THERMODYNAMICS
Properties of Gasses - Boyel’s Law, Charles Law. The combined Gas Law; The Laws of Thermodynamics; Properties of Water; Water in the Atmosphere – Humidity and Relative Humidity, Water Ballance between the atmosphere and hydrophilic materials

UNIT III    MECHANICAL PROPERTIES
Tensile Load and Deformation - stress and strain definitions - pressure. work and modulus of elasticity –; Bending Load and Deformation– bending rigidity - force couple study; Shear and Torsion – sheer and torsional rigidity; studies-measurements of the above methods of loading.

UNIT IV    OPTICAL AND FRICTIONAL STUDIES

UNIT V    ELECTRICAL PROPERTIES
Theory of electrical conductance and resistance – measurement of – units of – study of different materials; static charges – formation – measurement techniques – study of different materials; Dielectrics – formation – measurements – control measures.

TOTAL : 45 PERIODS

TEXT BOOKS

REFERENCES
UNIT I  WATER

UNIT II  CHEMISTRY OF INTERFACES

UNIT III  OILS, FATS, SOAPS & LUBRICANTS
Chemical constitution, Chemical analysis of oils and fats – acid, saponification and iodine values, Definitions, determinations and significance.Definition, mechanism of lubrication, preparation of petrolubes, desirable characteristics – viscosity, viscosity index, carbon residue, oxidation stability, flash and fire points, cloud and pour points, aniline point. Semisolid lubricant – greases, preparation of sodium, lithium, calcium and axle greases and uses, consistency test and drop point test. Solid lubricants – graphite and molybdenum disulphide

UNIT IV  CHEMICALS AND AUXILIARIES

UNIT V  COLORANTS
Theory of color and constitution: chromophore and auxochrome, classification of dyes based on application. Chemistry and synthesis of , azo dye.

TOTAL : 45 PERIODS

REFERENCES

GE8251 ENGINEERING MECHANICS L T P C
3 1 0 4

OBJECTIVE
To develop capacity to predict the effect of force and motion in the course of carrying out the design functions of engineering

UNIT I BASICS AND STATICS OF PARTICLES 9 + 3

UNIT II EQUILIBRIUM OF RIGID BODIES 9 + 3
Free body diagram – Types of supports –Action and reaction forces –stable equilibrium – Moments and Couples – Moment of a force about a point and about an axis – Vectorial representation of moments and couples – Scalar components of a moment – Varignon’s theorem – Single equivalent force -Equilibrium of Rigid bodies in two dimensions – Equilibrium of Rigid bodies in three dimensions

UNIT III PROPERTIES OF SURFACES AND SOLIDS 9 + 3
Centroids and centre of mass– Centroids of lines and areas - Rectangular, circular, triangular areas by integration – T section, I section, - Angle section, Hollow section by using standard formula –Theorems of Pappus - Area moments of inertia of plane areas – Rectangular, circular,

UNIT IV    DYNAMICS OF PARTICLES


UNIT V    FRICTION AND ELEMENTS OF RIGID BODY DYNAMICS

Friction force – Laws of sliding friction – equilibrium analysis of simple systems with sliding friction –wedge friction-. Rolling resistance -Translation and Rotation of Rigid Bodies – Velocity and acceleration – General Plane motion of simple rigid bodies such as cylinder, disc/wheel and sphere.

TOTAL : 45 PERIODS

TEXT BOOKS


REFERENCES


UNIT I  ELECTRICAL CIRCUITS  9
Basic principles involved in power generation, transmission and use – Ohms Law Kirchoff’s Law – steady state solution of DC circuits – Theorem: Thevinin’s, Norton’s and Superposition Theorems.

UNIT II  AC CIRCUITS  9
Introduction to AC circuits – waveforms and RMS value – power and power factor, single phase and three-phase balanced circuits, housing wiring, industrial wiring, materials of wiring.

UNIT III  ELECTRICAL MACHINES  9

UNIT IV  ELECTRONIC DEVICES & CIRCUITS  9

UNIT V  MEASUREMENTS & INSTRUMENTATION  9
Introduction to transducers: pressure, temperature, position, electrical measurements - Classification of instruments – moving coil and moving iron ,Ammeter and Voltmeter – multimeters – dynamometer type Wattmeter – three-phase power measurements – energy meter – megger – instrument transformer (CT and PT )

TOTAL: 45 PERIODS

REFERENCES

PH8261
APPLIED PHYSICS LAB
L T P C
0 0 2 1

LIST OF EXPERIMENTS
1. X-ray powder method
2. Study of crystal lattices
3. Torsion test
4. Density measurements of fibres
5. Electrical resistance measurement
6. Optical absorption –Spectrometer
7. FTIR study
8. pH measurement
9. Thermal conductivity
10. Di-electric constant
11. Viscosity of liquid
12. Strain gauge meter – Young’s modulus
13. Instrumentation amplifier
14. Electrical conductivity
15. Creep characterization
16. Melt flow index of polymers

TOTAL : 30 PERIODS
LIST OF EXPERIMENTS

1. Preparation of solutions with various normality and molarity.
2. Determination of Redwood / Saybolt numbers, kinematic viscosity and viscosity index of lubricating oils
3. Determination of flash point, fire point, cloud and pour point of oils
4. Determination of acid value, saponification number and iodine value of oils
5. Determination of total, temporary, permanent, calcium and magnesium hardness of water samples
6. Determination of chloride, sulphate , and COD of water samples
7. Determination of purity of washing soda and strength of a commercial acid
8. Estimation of available chlorine in hypochlorite solution
9. Estimation of strength of hydrogen peroxide
10. Synthesis of a dye, preparation of soap and a defoamer

TOTAL : 30 PERIODS

LIST OF EXPERIMENTS

EE8261  ELECTRICAL AND ELECTRONICS LABORATORY

1. Study of DC & AC Starters
2. Wheatstone Bridge and Schering Bridge
3. Speed Control of DC Shunt Motor
4. Load Test on DC Shunt Motor
5. OCC & Load Characteristics of DC Shunt Generator
6. Load Test on Single-Phase Transformer
7. Load Test on Three-Phase Induction Motor
8. Load Test on Single-Phase Induction Motor
9. Study of Transducers
10. ADC and DAC Converters

TOTAL : 45 PERIODS
OBJECTIVES

• To make the students acquire a sound knowledge in statistical techniques that model engineering problems.
• The Students will have a fundamental knowledge of the concepts of probability.

UNIT I RANDOM VARIABLES 9+3
Discrete and Continuous random variables – Moments – Moment generating functions – Binomial, Poisson, Geometric, Uniform, Exponential, Gamma, Weibull and Normal distributions - Functions of a random variable.

UNIT II TWO-DIMENSIONAL RANDOM VARIABLES 9+3
Joint distributions – Marginal and Conditional distributions – Covariance – Correlation and Linear regression – Transformation of random variables – Central limit theorem (for independent and identically distributed random variables).

UNIT III TESTS OF SIGNIFICANCE 9+3

UNIT IV DESIGN OF EXPERIMENTS 9+3
Completely randomized design – Randomized block design – Latin square design - 22 - factorial design - Taguchi’s robust parameter design.

UNIT V STATISTICAL QUALITY CONTROL 9+3
Control charts for measurements ( and R charts) – Control charts for attributes (p, c and np charts) – Tolerance limits - Acceptance sampling.

TOTAL : 60 PERIODS

TEXT BOOKS

REFERENCES


GE8351 ENVIRONMENTAL SCIENCE AND ENGINEERING L T P C 3 0 0 3

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY 14

Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.

Field study of common plants, insects, birds

Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT II ENVIRONMENTAL POLLUTION 8

Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – soil waste management: causes, effects and control measures of municipal solid wastes –
role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides.

Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT III  NATURAL RESOURCES

Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles.

Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

UNIT IV  SOCIAL ISSUES AND THE ENVIRONMENT


UNIT V  HUMAN POPULATION AND THE ENVIRONMENT


TOTAL : 45 PERIODS
TEXT BOOKS

REFERENCE BOOKS

TT8301  FUNDAMENTALS OF POLYMER CHEMISTRY  L T P C
3 0 0 3

UNIT I
9
Introduction to natural and synthetic polymers; Terms and fundamental concepts; Step-growth polymerization, Carother’s equation, Functionality, Crosslinking; PET manufacturing; Chain growth polymerization, Free radical polymerization, Kinetics of free-radical initiation, termination, chain transfer, Mayo’s equation, cage effect, autoacceleration, inhibition and retardation;

UNIT II
9
Polypropylene manufacturing; Acrylic manufacturing; Atom transfer radical polymerization, ionic polymerization, ring opening polymerization; Nylon-6 manu-facturing; Co-polymerization and its importance. Copolymer equation, reactivity ratio, tailor making of copolymer properties; Techniques of chain polymerization; Bulk, solution, emulsion, microemulsion and suspension polymerization; chemical modification of fibres; Polymer solution, Flory’s theory; Interaction parameter.

UNIT III
9
Molecular weight and its distributionby: End group analysis, osmometry, light scattering, ultra centrifugation, gel permeation chromatography, intrinsic viscosity; Spectroscopic methods of
polymer characterization such as, FTIR, UV, NMR and others.

UNIT IV
Compounding of polymers - fillers, plasticizers, antioxidants, UV stabilizers, colouring agents and flame retardants. Polymer processing - compression, moulding, injection, extrusion, calendering and film casting; Preparation and properties of polyesters, polyamides, epoxy and silicone polymers; Conductive polymers, super absorbent polymers.

UNIT V
Recycling, remoulding, depolymerisation, incineration, biodegradable polymers.

TOTAL : 45 PERIODS

REFERENCES

TT8302 TECHNOLOGY OF PRE SPINNING PROCESS L T P C 3 0 0 3

UNIT I INTRODUCTION
Sequence of spinning machinery for producing carded, combed and blended yarns in
short staple and long staple spinning system; yarn numbering systems-direct, indirect and conversions; influence of characteristics of raw material—fibre fineness, length, strength, elongation, stiffness, fibre friction, cleanliness on spinning performance; spinnability

UNIT II GINNING AND BLOWROOM MACHINERY
Description and working of different types of gins; selection of right type of gins; ginning performance on yarn quality; objects, principle and description of opening, cleaning and blending machines used in blowroom; chute feed; cleaning efficiency, production calculations.

UNIT III CARDING MACHINE
Objects and principle of carding; detailed study of flat card; autolevelling; card clothing and its maintenance; drives and production calculation.

UNIT III COMBER
Objectives of comber preparatory; detailed study of sliver lap, ribbon lap and super lap formers; objects and principles of combing; sequence of combing operation; combing efficiency and production calculation.

UNIT IV DRAWING MACHINE AND ROVING MACHINE
Tasks of drawing machine; drafting systems used in modern drawing machines; autolevelling; draft and production calculation; objectives of roving machine; working of roving machine; bobbin builder mechanism—mechanical and electro-mechanical; draft, twist and production calculations.

TOTAL : 45 PERIODS

REFERENCES
5. Lord P.R., “Yarn Production: Science, Technology and Economics“, The Textile Institute, Manchester, 1999
   The Textile Institute, Manchester, 1993

UNIT I **BASICS OF WINDING**
Objects of winding; principles of cheese and cone winding machines; uniform build of yarn
package; types of drums – half accelerated and fully accelerated drums; control of balloons;
Classification of yarn faults and its removal; concepts in yarn clearing – mechanical, optical
and electronic clearerers; knotters and splicers

UNIT II **PROCESS CONTROL IN WINDING**
Faults in wound packages, their causes and remedies; winding synthetic and blended yarns;
weft winding; winding for colouration; quality of knots and splices; study of modern automatic
winders. winding performance; productivity; maintenance; quality control; material handling.

UNIT III **WARPING**
Objectives of warping, material flow in beam warping and creels used in warping machines;
sectional warping machines.

SIZING
objectives of sizing; sizing materials and recipii used for different types of fibers; size preparation
equipment; sizing machines; sizing filament yarns; concept of single end sizing, combined
dyeing and sizing. Control concepts in modern sizing; energy conservation in sizing; Sizing
defects and production calculations.

UNIT IV **PROCESS CONTROL IN WARPING And SIZING**
process control in warping (production calculation, machine and labor productivity, control of
end breaks, quality and hard waste in warping); Control systems used in sizing machine.

UNIT V **DRAWING-IN**
Need for drawing-in operation; manual and automatic drawing- in, leasing, knotting and
pinning machines; selection and care of reeds, healds and drop pins, control of cross ends
and extra ends and calculations.

TOTAL : 45 PERIODS
REFERENCES

TT8351 CHARACTERISTICS OF TEXTILE FIBRES I L T P C 3 0 0 3

UNIT I STRUCTURE OF FIBRES 6
Study of structures of natural and man-made fibers – physical, chemical and morphological structures. Molecular conformations – planar zig-zag, helical, lamellar, and sphrulite conformations.

UNIT II STRUCTURE INVESTIGATION TECHNIQUES 12
Transmission and Scanning electron microscopes-principle construction and working; X-ray diffraction techniques – X-ray analysis-estimation of crystallinity; Infrared radiation and dichroism.techniques – chemical element and group identification by transmittance and optical density methods. Molecular orientation estimation, Typical molecular structures of commercially important fibers.

UNIT III MOISTURE ABSORPTION CHARACTERISTICS OF FIBRES 9

UNIT IV TENSILE CHARACTERISTICS OF FIBRES 9
Tensile characteristics –Study of strength, elongation, work of rupture, initial modulus, work factor and yield point – determination of yield point. Stress-strain relations of natural and man-made fibres - influence of humidity and temperature on tensile characteristics .Time effects- Study of creep phenomena.
UNIT V  ELASTIC RECOVERY BEHAVIOUR OF FIBRES

Elastic recovery and its relation to stress and strain of fibres; mechanical conditioning of fibres and its influence on elastic recovery. Load cycling and extension cycling-their effect on elastic recovery.

TOTAL: 45 PERIODS

REFERENCES


LIST OF EXPERIMENTS

1. Identification of fibres by feel, microscopic view, burning behavior and solubility

   a. Natural cellulose fibres

   b. Natural protein fibres

   c. Regenerated cellulose fibres

   d. Polyamide fibres
e. Polyester fibres  
f. Polyolefin fibres

2. Determination of density of various fibres by density gradient column 
3. Determination of denier of synthetic fibres by gravimetric method 
4. Determination of Moisture Regain and Moisture content of fibres 
5. Determination of the percentage of spin finish of synthetic fibres 
6. Determination of wax content of the cotton fibres 
7. Determination of the blend proportion  
a. Natural/ regenerated cellulose  
b. Cellulose/ protein fibres  
c. Cellulose/polyester fibres  
d. Natural cellulose/ regenerated cellulose/polyester  
8. Thermo gravimetric analysis of fibres  
9. FTIR analysis of polymers and fibres

TOTAL : 45 PERIODS

**LIST OF EXPERIMENTS**

1. Construction details of blow room machines and the material passage 
2. Cleaning efficiency and production calculations in blow room 
3. Construction details of carding machine and the material passage 
4. Draft and production calculations in carding machine 
5. Wire point specifications and settings in card  
6. Construction details of drawinging machine, material passage, draft and production calculations 
7. Production calculations in comber preparatory machines  
8. Construction details of comber and material passage  
9. Combing cycle, draft and production calculations 
10. Construction details of roving machine, material passage 
11. Draft, Twist and production calculations in roving machine  
12. Study of builder mechanism of roving machine
13. Determination of degree of openness of fibre at blow room
14. Determination of neps present in the card and comber web

TOTAL: 45 PERIODS

MA8353  NUMERICAL METHODS  L T P C
3 1 0 4

OBJECTIVES
• To provide the mathematical foundations of numerical techniques for solving linear system, eigenvalue problems, interpolation, numerical differentiation and integration and the errors associated with them;
• To demonstrate the utility of numerical techniques of ordinary and partial differential equations in solving engineering problems where analytical solutions are not readily available.

UNIT I  SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS  9+3

UNIT II  INTERPOLATION AND APPROXIMATION  9+3
Interpolation with unequal intervals - Lagrange interpolation – Newton’s divided difference interpolation – Cubic Splines - Interpolation with equal intervals - Newton’s forward and backward difference formulae – Least square method - Linear curve fitting.

UNIT III  NUMERICAL DIFFERENTIATION AND INTEGRATION  9+3

UNIT IV  INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS  9+3
Single step-methods - Taylor’s series method - Euler’s method - Modified Euler’s method -

UNIT V BOUNDARY VALUE PROBLEMS IN ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS

Finite difference methods for solving two-point linear boundary value problems. Finite difference techniques for the solution of two dimensional Laplace’s and Poisson’s equations on rectangular domain – One dimensional heat-flow equation by explicit and implicit (Crank-Nicholson) methods - One dimensional wave equation by explicit method.

TOTAL : 60 PERIODS

TEXT BOOKS

REFERENCES

CH8351 SOLID MECHANICS FOR TECHNOLOGISTS

AIM
To given them knowledge on structural, Mechanical properties of Beams, columns.

OBJECTIVES
• The students will be able to design the support column, beams, pipelines, storage tanks and reaction columns and tanks after undergoing this course. This is precursor for the study on process equipment design and drawing.
OUTCOMES:
- Solve the problems related to the structural components under various loading conditions

UNIT I STRESS, STRAIN AND DEFORMATION OF SOLIDS 9

UNIT II TRANSVERSE LOADING ON BEAMS 9

UNIT III DEFLECTIONS OF BEAMS 9
Double integration method – Macaulay’s method – Area – moment theorems for computation of slopes and deflections in beams.

UNIT IV STRESSES IN BEAMS 9
Theory of simple bending – assumptions and derivation of bending equation \( \frac{M}{I} = \frac{F}{Y} = \frac{E}{R} \) – analysis of stresses in beams – loads carrying capacity of beams – proportioning beam sections – leaf springs – flitched beams – shear stress distribution in beams – determination of shear stress in flanged beams.

UNIT V TORSION AND COLUMNS 9
Torsion of circular shafts – derivation of torsion equation \( \frac{T}{J} = \frac{fs}{R} = \frac{C}{L} \) – stress and deformation in circular and hollow shafts – stresses and deformation in circular and hollow shafts – stepped shafts – shafts fixed at both ends – stresses in helical springs – deflection of springs – spring constant. Axially loaded short columns – columns of unsymmetrical sections – Euler’s theory of long columns – critical loads for prismatic columns with different end conditions – effect of eccentricity.

TOTAL : 45 PERIODS

TEXT BOOKS
UNIT I  INTRODUCTION TO WEAVING 6
Yarns quality requirements for high speed automatic shuttle looms and shuttle less loom; warp and weft preparation for high speed looms; Principle of weaving with hand and power looms, passage of material, motions in loom – primary, secondary and auxiliary motions, plain power loom driving, timing of motions.

UNIT II  SHEDDING MOTIONS 12
Shed geometry and shedding requirement. Types of shed. Shedding mechanisms - positive and negative. Principles of tappet, dobbý and jacquard shedding mechanisms, reversing mechanisms- limitations of various shedding mechanisms; Conventional and modern dobbý and jacquard mechanism.

UNIT III  WEFT INSERTION AND BEAT UP 18
Shuttle picking and checking mechanisms, shuttle flight and timing; Weft feeder – types, Principles of weft insertions in shuttle less looms; mechanism of weft insertion by projectile, rapier loom and jet – air and water. Multi-Phase weaving systems; Kinematics of sley, sley eccentricity; beat up mechanism in modern looms;

UNIT IV  SECONDARY AND AUXILIARY MOTIONS LOOMS 12
Take up and let - off motions used in plain power looms; cloth formation, weaving condition - factors and control; warp protector and warp and weft stop motion; plain power loom accessories. Automatic weft replenishment in shuttle looms – pirn changing and shuttle changing looms; mechanisms involved in automatic pirn changing – feelers, cutters, design of shuttle, three try motions; multi shuttle looms- box changing principle, Automatic pirn changing
in multi shuttle loom. Weft arrival control and automation in shuttle less looms; selvedges in shuttle less looms; quick style change;

UNIT V PROCESS CONTROL & SPECIAL WEAVING PROCESS

Techno economics of shuttle less loom weft insertion systems; loom monitoring and control
Loom stoppages and efficiency; fabric defects and value loss; fabric shrinkage in the loom -
causes and control; fabric engineering. Filament weaving – Silk & Texturised yarns. Principles and mechanisms in weaving Pile fabrics, tapes and triaxial fabrics

TOTAL: 60 PERIODS

REFERENCES

TT8402 TECHNOLOGY OF YARN SPINNING

UNIT I RING SPINNING
Principle of yarn formation in ring spinning machines; working of ring spinning machine; cop building; design features of important elements used in ring spinning machine; draft, twist and production calculations in ring spinning machine; end breakage rate – causes and remedies

UNIT II CONDENSED YARN SPINNING
Condensed yarn spinning – principle, different methods, properties; comparison with ring spun yarn

UNIT III YARN PLYING
Merits of plying of yarns; methods followed for plying – TFO, ring twisting; selection of twist
level for plying; calculation of resultant count of plied yarns; types of fancy yarns, method of production

UNIT IV ROTOR SPINNING
Principle of open end spinning; principle of yarn production by rotor spinning system; design features of important elements used in rotor spinning; properties of rotor yarn

UNIT V OTHER SPINNING SYSTEMS
Friction and air-jet spinning methods – principle of yarn production, raw material used, structure, properties and applications; principle of yarn production by self-twist, core, wrap, integrated compound spinning systems.

TOTAL : 45 PERIODS

REFERENCES
5. Lord P.R., “Yarn Production: Science, Technology and Economics”, The Textile Institute, Manchester, 1999

TT8451 CHARACTERESTICS OF TEXTILE FIBRES II

UNIT I TORSIONAL CHARACTERISTICS
UNIT II  FLEXURAL CHARACTERISTICS

Flexural rigidity of fibres – measurement techniques - Flexural rigidity and its relation to other fibre properties - comparison of various fibres.

UNIT III  OPTICAL CHARACTERISTICS

Reflexion and Lustre-objective and subjective methods of measurement - refractive index and its measurement - birefringence, factors influencing birefringence - Absorption and dichroism

UNIT IV  FRICTIONAL CHARACTERISTICS

Friction – static, limiting and kinetic friction , its measurement, comparison of fibres, directional friction in wool - frictional and surface characteristics of natural and synthetic fibres - friction and lubrication.

UNIT V  ELECTRICAL AND THERMAL CHARACTERISTICS

Electrical resistance of fibres – measurement, factors influencing electrical resistance;di-electric behaviour–factors influencing di-electric properties; static electricity–measurement,problems and elimination techniques; thermal conductivity, thermal expansion and contraction, melting.

TOTAL : 45 PERIODS

REFERENCES


UNIT I
Elementary weaves – plain and its derivatives, twill and its derivatives, satin, sateen and their derivatives – loom requirements

UNIT II
Ordinary and Brighten Honey Comb; Huck-a-Back and its modifications; Mock Leno; crepe weaves; colour theory – light and pigment theory; modification of colour; application of colours; colour and weave effects – loom requirements

UNIT II
Bedford cords - plain and twill faced, wadded; welts and piques, wadded piques; backed fabrics - warp and weft, reversible and non-reversible fabrics; extra warp and extra weft figuring - single and double colour – loom requirements

UNIT IV
Pile fabrics; warp pile - wire pile, terry pile, loose backed; weft pile – plain back and twill back velveteen, lashed pile, corduroy, weft plush – loom requirements

UNIT V
Double cloth, types of stitches; Damasks; Gauze and Leno principles – loom requirements, 3D fabrics.

TOTAL: 45 PERIODS

REFERENCES

TT8411 SPINNING PROCESS LAB II

LIST OF EXPERIMENTS
1. Construction details of ring spinning machine and material passage
2. Draft, Twist and production calculations in ring spinning machine
3. Study of builder mechanism of ring spinning machine
4. Selection of ring travellers
5. Construction details of rotor spinning machine and material passage
6. Draft, Twist and production calculations in rotor spinning machine
7. Production of carded web using miniature card
8. Production of sliver using miniature drawing machine
9. Production of yarn using ring spinning machine
10. Production of yarn using rotor spinning machine
11. Analysis of MIS reports from spinning mills

TOTAL: 45 PERIODS

TT8461 CLOTH ANALYSIS LAB

Analysis of construction details of the following fabric structure
1. Plain and its derivatives
2. Twill and its derivatives
3. Satin (Regular and irregular)
4. Sateen (Regular and irregular)
5. Honeycomb (ordinary and Brighton)
6. Huck-a-back
7. Extra warp and extra weft figuring
8. Pile fabrics (warp and weft)
9. Backed fabrics
10. Gauze and Leno
11. Double cloth
12. Crepe
13. Tapestry
14. Mock-leno
15. Bedford cord.
16. Single jersey
17. Double jersey structures
18. Analysis of blend composition in the yarn of the fabric
19. Analysis of finish on the fabric

TOTAL: 45 PERIODS

TT8501  CHEMICAL PROCESSING OF TEXTILE MATERIALS I  L T P C
3 0 0 3

UNIT I
Chemical structure of fibres; action of chemicals on fibres; natural and added impurities in textiles; singeing and desizing of natural and synthetic fibres and its blends; heat setting.

UNIT II
Scouring, bleaching and mercerization of cotton, bioscouring of cotton; carbonization, scouring and bleaching of wool; degumming of silk

UNIT III
Loose stock machine; hank and package processing machines; yarn singeing machine; woven and knitted fabric singeing machines; stretching devices; shearing and raising machines; kiers; mangles; jigger; winch; jet and soft flow machines; yarn mercerizer, chain and chainless mercerizers; continuous scouring and bleaching machines; washing ranges, hydro extractors; detwisters; dryers; stenters.
UNIT IV
Calendering, crease proofing, shrink proofing and softening; wool finishing.

UNIT V
Water and oil repellant finishes; fire retardant finish; antibacterial finish; Application of nanotechnology in finishing; assessment of finishes

TOTAL : 45 PERIODS

REFERENCES

TT8502 KNITTING TECHNOLOGY

UNIT I INTRODUCTION

UNIT II FUNDAMENTALS OF KNITTING
General definitions and principles of knitting; Types of knitting needles – Bearded, Latch & Compound Needle. Elements of knitted loop structure.
UNIT III  WEFT KNITTING

Basic weft knitted structures and their production - plain, rib, interlock and purl; Fundamentals of formation of knit, tuck and float stitches; factors affecting the formation of loop; effect of loop length and shape on fabric properties; Analysis of various types of weft knitted structure. Weft knitted fabric geometry.

UNIT IV  WEFT KNITTING MACHINES

Construction, Characteristics and working of circular knitting machines used for the production of basic structures; production of derivatives of weft knitted structures; needle control in circular knitting machines; quality control in knitted fabric production; production calculation. Basic principles and elements of flat knitting machines; different types of flat knitting machines - manual, mechanical and computer controlled; production of various weft knitted structures using flat knitting machines.

UNIT V  WARP KNITTING

Basic principles; elements of warp knitted loop – open loop, closed loop; warp knitting elements- chain link, chain links for simple patterns, guide bar movement mechanism.

Tricot and Rachel warp knitting machines. Principles of double needle bar patterning, Terry pile fabric production. Let off system; run in value based on the lapping diagram; take up system; theoretical concepts of warp knitted loop configuration.; Uses of warp knitted fabrics in technical applications.

TOTAL : 60 PERIODS

REFERENCES

9. Die Maschenbindungen der Kettenwirkerai, “An Introduction to the Stitch Formations in Warp Knitting”, Published Employee’s Association, Karl Mayer.e.V., Germany, 1966

TT8503 PROCESS CONTROL IN SPINNING

UNIT I LEVELLING
Different levelling methods adopted in the spinning machines to achieve better uniformity of the products; influence of the uniformity of the intermediate products on the yarn quality; effect of machines and processing parameters on product uniformity; importance of fibre-mix homogeneity on yarn quality; types and levels of mixing in the preparatory processes; assessment of fibre-blend variations.

UNIT II NEP AND HOOK REMOVAL
Causes of nep and hook formation in the fibre-opening processes; improving the removal of neps in the carding and combing machines; maximizing the fibre hook straightening during the preparatory operations; measurement of neps and hooks.

UNIT III WASTE CONTROL
Control of waste in blowroom, card and combers; influence of machine and processing parameters on waste removal; controlling the lint content in waste; cleaning efficiency and cleaning intensity.

UNIT IV PRODUCTION CONTROL
Factors affecting the production limits of the spinning machinery; achieving maximum production in the given machinery; new concepts in achieving higher production in the spinning machinery; role of machinery maintenance and humidity control on production efficiency; computation of the productivity indices.
UNIT V  YARN QUALITY ANALYSIS & MAN-MADE FIBRE PROCESSING  
Analysis and control of within length and between length variations and spectrogram; yarn faults classifications; causes and remedies for yarn defects. Optimum processing conditions required for man-made-fibres like polyester, viscose in the spinning machinery.

TOTAL : 45 PERIODS

REFERENCES
2. Lord P.R., “Yarn Production; Science, Technology and Economics”, The Textile Institute, Manchester, 1999
4. Van der Sluijs M and Hunter L., “Neps in Cotton Lint, Textile Progess “,The Textile Institute, Manchester, 1999
5. Klein W., “Man-made Fibres and their Processing” ,The Textile Institute, Manchester, 1994

UNIT I  INTRODUCTION  
Definition of quality- importance of quality assessment- selection of samples for quality assessment – random and biased samples – squaring technique and zoning technique for fibre selection; yarn sampling - use of random numbers - sampling for various types of yarn tests.

UNIT II  FIBRE LENGTH AND STRENGTH ANALYSIS  
Fibre testing, the fibre quality index and spinnability; Fibre length and length uniformity- measuring techniques. Strength Tensile Testing modes – CRT, CRE, CRL and ARL; Fibre strength, importance, relation to yarn strength; Measurement techniques.
UNIT III  FIBRE FINENESS, MATURITY AND TRASH ANALYSIS


UNIT IV  YARN COUNT, TWIST AND STRENGTH

Yarn numbering systems-Indirect and direct systems-count conversions; Count measuring systems. Twist in single and ply yarns –twist direction – twist factor – twist and yarn strength; twist measurement and breaking twist angle measurement. Single yarn strength; Lea count-strength product (CSP) and Corrected Count Strength Product (CCSP).

UNIT V  YARN MASS EVENNESS AND SURFACE QUALITY


TOTAL : 45 PERIODS

REFERENCES

UNIT I POLYMER RHEOLOGY
Transport Phenomena in Fibre Manufacturing- Heat and mass; Polymer rheology-Newtonian and non-Newtonian fluids; Necessary conditions of fibre forming polymer; Melt instabilities.

UNIT II MELT SPINNING
Melt Spinning- Polymer Selection and Preparation, equipments, properties and applications of polyester, polyamide and polypropylene fibres.

UNIT III SOLUTION SPINNING
Solution spinning- Polymer Selection and Preparation, equipments, properties and applications of acrylic, polyurethane and regenerated cellulose fibres.

UNIT IV POST SPINNING OPERATIONS
Neck drawing, drawing systems, influence of drawing on structure and properties of fibres; Types of heat setting, influencing parameters on heat setting, influence of heat setting on fibre behavior; Spin finish application; texturising.

UNIT V ADVANCES IN FIBER SPINNING
Liquid crystal spinning; Gel spinning; Profile fibres, hollow & porous fibres; Speciality fibres-polyglycolic acid, polylactic acid, chitosan fibres preparation properties and applications.

TOTAL : 45 PERIODS

REFERENCES
OBJECTIVES

• To enhance the employability skills of students with a special focus on Presentation skills, Group discussion skills and Interview skills
• To help them improve their soft skills, including report writing, necessary for the workplace situations

2. Creating effective PPTs – presenting the visuals effectively
3. Using body language with awareness – gestures, facial expressions, etc.
4. Preparing job applications - writing covering letter and résumé
5. Applying for jobs online - email etiquette
6. Participating in group discussions – understanding group dynamics - brainstorming the topic
7. Training in soft skills - persuasive skills – sociability skills - questioning and clarifying skills – mock GD
8. Writing reports – collecting, analyzing and interpreting data – drafting the report
9. Attending job interviews – answering questions confidently
10. Interview etiquette – dress code – body language – mock interview

TOTAL: 30 PERIODS

Requirements for a class of 30 students

1. A PC or a lap top with one or two speakers
2. A Collar mike and a speaker
3. An LCD projector and a screen
4. CD’s and DVD’s on relevant topics
5. Individual chairs for conducting group discussions
REFERENCE BOOKS

EXTENSIVE READERS

WEB RESOURCES
1. www.humanresources.about.com
2. www.careerride.com

TT8511 FABRIC MANUFACTURE LABORATORY

0 0 3 2

LIST OF EXPERIMENTS
1. Analysis of Yarn faults
2. Control of production, package density, yarn faults in cone / cheese winding machine
3. Determination of depth of shed and heald shaft movements in tappet shedding mechanism
4. Preparation of pattern card for dobbi shedding mechanism and way in which adjust the depth of shed
5. Study of jacquard shedding mechanism
6. Power required to insert the weft through shuttle in over and under picking mechanism
7. Study of picking mechanism in shuttleless loom
8. Control of sley eccentricity and Beat-up force in weaving
9. Study of let-off mechanisms
10. Determination of pick space through 5 and 7 wheel take-up mechanisms
11. Study of weft replenishment mechanism in shuttle looms
12. Method of achieving the required colour patterns in 4 X 1 drop box motion
13. Study of warp protector mechanism
14. Study of plain, rib and interlock circular knitting machines
15. Study of flat knitting machines

TOTAL: 45 PERIODS

TT8512 FIBRE AND YARN QUALITY EVALUATION LABORATORY L T P C 0 0 3 2

LIST OF EXPERIMENTS
Determination of
1. Fibre fineness
2. Fibre length
3. Fibre maturity
4. Fibre trash content
5. Bundle fibre strength
6. Fiber migration parameters
7. Roving, sliver and yarn linear density
8. Single yarn strength
9. Yarn lea strength
10. Yarn single and ply yarn twist
11. Yarn impact strength
12. Yarn to yarn abrasion
13. Unevenness of yarn
14. Assessment of yarn appearance

TOTAL: 45 PERIODS
UNIT I COLOUR SCIENCE
Theories of colour measurement, Beer–Lambert’s law and Kubelka-Munk theory and their application in colour assessment and colour matching; whiteness and yellowness indices.

UNIT II THEORY OF DYEING
Dyeing equilibrium; dye-fibre interaction; adsorption isotherm; dye affinity; heat of dyeing; half dyeing time.

UNIT III DYEING
Basic characteristics of dyes and pigments; classification of dyes and principle of application of dyes; Chemistry and technology of application of direct, reactive, disperse, acid and basic dyes; processing of denims; determination of fastness properties.

UNIT IV PRINTING
Methods and styles of printing; printing machines; constituents of printing paste; printing with direct, reactive, acid and disperse dyes; printing with pigments

UNIT V KNITS AND GARMENTS
Dimensional stabilization of tubular and open width knits; garment dyeing and printing; garment washing

TOTAL : 45 PERIODS

REFERENCES

UNIT I
Anthropometry, mass-production, mass-customization; pattern making, grading, marker planning, spreading & cutting

UNIT II
Different types of seams and stitches; single needle lock stitch machine - mechanism and accessories; needle – functions, special needles, needle size, numbering, needlepoint; sewing thread-construction, material, thread size, packages.

UNIT III
Labels, linings, interlinings, wadding, lace, braid, elastic, hook and loop fastening, shoulder pads, eyelets and laces, zip fasteners, buttons

UNIT IV
Raw material, in process and final inspection; needle cutting; sewability of fabrics; strength properties of apparel; dimensional changes in apparel due to laundering, dry-cleaning, steaming and pressing; care labeling of apparel

UNIT V
Garment dyeing, printing and finishing; pressing categories and equipment, packing

TOTAL : 60 PERIODS

REFERENCES

TT8603 MECHANICS OF TEXTILE MACHINERY

UNIT I
Equations of forces, motion and energy; energy stored in rotating masses.

UNIT II
Clutches and brakes – types, application in textile machines; gears, gear trains; power transmission – different modes, advantages and limitations, applications

UNIT III
Differential and variable speed drives – principles, application in textile machines; design of cone drums – piano feed regulation, roving machine builder mechanism;

UNIT IV
Friction – calculations; bearings, design of drive transmitting shafts, balancing of rotating masses

UNIT V
Design of winder drums; kinematics of shedding; design of tappets; beat up force, sley eccentricity; power for picking

TOTAL : 45 PERIODS
REFERENCES

TT8651 FABRIC QUALITY EVALUATION LTPC 3 0 0 3

UNIT I CONSTRUCTION CHARACTERISTICS 9
Basic fabric particulars – Measurement of ends and picks per inch, count of warp and weft, determination of the type of weave, measurement of length, width, thickness and Area density (GSM); warp and weft crimp measurements for spun and filament yarn fabrics, the cover factor calculations; Fabric sampling techniques.

UNIT II STRENGTH CHARACTERISTICS 9

UNIT III COMFORT AND SURFACE CHARACTERISTICS 9
Fabric stiffness – principle of measurement of flexural rigidity; Drapeability – measurement of drape coefficient; Crease recovery measurement techniques. Wrinkle recovery assessment using standard grades; Principle and functioning of air permeability testers, water repellency, contact angle and fabric shrinkage testing; Fabric abrasion resistance – measuring technique; Fabric pilling resistance – methods of determination.

UNIT IV SPECIAL CHARACTERISTICS 5
Fabric bending hysteresis testing; Shear hysteresis measurements; Fabric compression and decompression behaviour; Fabric surface roughness and friction measurements; Fabric tensile hysteresis measurements; Fabric flame resistance testing methods; Moisture and thermal characteristics.
UNIT V  FABRIC INSPECTION AND GARMENT QUALITY


TOTAL : 45 PERIODS

REFERENCES


TT8652 FINANCIAL MANAGEMENT FOR TEXTILE AND APPAREL INDUSTRIES  LTPC

UNIT I  18
Costing - concepts; classification of costs; preparation of cost sheet; costing of yarn, fabric and garment; cost profit volume analysis, breakeven analysis

UNIT II  9
Depreciation – method of computing depreciation; techniques of investment analysis - payback period method, accounting rate of return, Discounted Cash Flow methods - IRR, NPV, PI

UNIT III  5
Capital structure; Sources and cost of capital; working capital management
UNIT IV
Tools for financial analysis and control - profit and loss account, balance sheet; financial ratio analysis - illustrations from textile unit

REFERENCES
2. Bhave P.V. and Srinivasan V., “Costing Accounting to Textile Mills”, ATIRA, Ahmadabad, 1976

TT8653 TECHNOLOGY OF BONDED FABRICS L T P C
3 0 0 3

UNIT I FUNDAMENTALS OF BONDED FABRICS 5
Definitions and classification of bonded fabrics; fibres, fibre preparations and their characteristics for the production of bonded fabrics, uses; methods of bonded fabric production

UNIT II WEB FORMATION WITH STAPLE FIBRES 9
Production of staple-fibre web by dry and wet methods; influence of web laying methods on fabric properties; quality control of web
UNIT III  MECHANICAL, CHEMICAL AND THERMAL BONDING  13
Bonded fabric production by mechanical bonding - needling, stitching, water jet consolidation; Thermal Bonding technologies; Chemical bonding – Binder polymers and bonding technologies

UNIT IV  POLYMER – LAID WEB AND FABRIC FORMATION  9
Manufacture of Spun bonded fabrics, fibre orientation in spun bonded fabrics and characterization of filament arrangement; Manufacture of Melt blown fabrics – fibre formation and its attenuation; Effect of processing parameters on fabric characteristics

UNIT V  FINISHING AND APPLICATION OF BONDED FABRICS  9
Dry and Wet finishing; Characterisation, structure - property relationship in bonded fabrics; End uses of bonded fabrics

TOTAL : 45 PERIODS

REFERENCES

TT8611  TEXTILE CHEMICAL PROCESSING LAB  L T P C
0 0 3 2

LIST OF EXPERIMENTS
2. Peroxide Bleaching of Cotton Yarn/Fabric.
3. Degumming of silk.
4. Identification of dyes
7. Dyeing of polyester using disperse dyes.
8. Dyeing of polyester and cotton blend
11. Determination of Whiteness and Yellowness index
12. Determination of K/S of dyed fabrics using Spectrophotometer
15. Antimicrobial Finish Evaluation

TOTAL : 45 PERIODS

TT8661 FABRIC QUALITY EVALUATION LAB L T P C
0 0 3 2

LIST OF EXPERIMENTS
Determination of
1. Fabric tensile strength
2. Fabric bursting strength
3. Fabric tear strength
4. Fabric flexural rigidity and bending modulus
5. Drapability of fabrics
6. Fabric crease recovery
7. Fabric wrinkle recovery
8. Fabric abrasion resistance
9. Fabric pilling resistance
10. Fabric air permeability
11. Fabric compression and decompression characteristics
12. Fabric surface roughness and friction coefficient
13. Seam strength and seam slippage

TOTAL : 45 PERIODS

72
UNIT I   GEOMETRY OF CLOTH STRUCTURE  10
Geometry of Plain and Non-Plain weaves; Peirce and Olofsson models; crimp ratio and thread spacing; Jamming of threads; Crimp interchange; Balance of crimp.

UNIT II   FABRIC DEFORMATION  10
Fabric deformation under tensile stress; prediction of modulus; tensile properties in bias direction; other fabric deformation – compression, shear, bending and buckling; fabric handle; Spirality and skewness formation and its control.

UNIT III   KNITTED FABRIC STRUCTURES  5
Geometry of weft and warp knitted structures, influence of friction on knit geometry; load-extension of warp knit fabrics; biaxial stress behavior of plain-knit fabrics

UNIT IV   NONWOVEN STRUCTURES  5
Structure of felts; mechanical behavior of needle felts; structure of stitch bonded fabrics

TOTAL : 30 PERIODS

REFERENCES
UNIT II  PACKING OF FIBERS IN YARNS  6
Idealized packing; measurement of packing density and radial packing density of yarn; Packing in actual yarns; Specific volume of yarns; measurement of yarn diameter.

UNIT III  FIBRE MIGRATION  6
Ideal migration, tracer fiber technique, characterization of migration behavior, migration in spun yarns, mechanisms of migration, effect of various parameters on migration behavior.

UNIT IV  MECHANICS OF CONTINUOUS FILAMENT YARNS  6
Analysis of tensile behavior; prediction of breakage; analysis of yarn modulus by energy method; observed extension and breakage of continuous filament yarns;

UNIT V  MECHANICS OF STAPLE FIBRE YARNS  6
Theoretical analysis of tensile behaviour; deduction based on fiber obliquity and slippage; influence of fiber length, fineness and friction on tensile behaviour; strength prediction model for blended yarns.

TOTAL : 30 PERIODS

REFERENCES

TT8703  TECHNICAL TEXTILES  L T P C  3 0 0 3

UNIT I  9
Design and characteristics required in textiles for transport applications; applications of textile reinforced composites in transport sector; quality requirement of yarns used in fishing industry like nets, ropes; conveyor belts, power transmission belts.
UNIT II
Design and characteristics required in textiles for medical and hygiene applications – antimicrobial, disposable and reusable products; Textiles in sports wear

UNIT III
Design and characteristics of home textiles; Garment design and choice of materials in protection from hazards due to mechanical, extreme climate, nuclear, biological, chemical and flame

UNIT IV
Use of geo textiles in filtration, drainage, separation and reinforcement application in construction; Type of fibre and fabric to be used in such applications; evaluation of geo textiles; use of textile materials in permanent and temporary civil construction - tents, awnings, sound and thermal insulation

TOTAL : 45 PERIODS

REFERENCES

TT8751 CLOTHING COMFORT LTPC 3003

UNIT I
Comfort – types and definition; human clothing system, comfort perception and preferences

UNIT II
Thermo physiological comfort – thermoregulatory Mechanisms of the Human Body, role of clothing on thermal regulations

UNIT III
Heat and moisture transfer – moisture exchange, wearer’s temperature regulations, effect of physical properties of fibres, behavior of different types of fabrics

UNIT IV
Psychological comfort; neuro physiological comfort - basis of Sensory Perceptions, measurement techniques - Mechanical Stimuli and thermal stimuli.

UNIT V
Fabric tactile and mechanical properties - fabric prickliness, itchiness, stiffness, softness, smoothness, roughness, and scratchiness. Predictability of clothing comfort performance

TOTAL: 45 PERIODS

REFERENCES
UNIT I
Scope of operation research, applications, limitations; linear programming problems – construction, solutions by graphical method, simplex method, Big M method; sensitivity analysis; application of LP technique for mixing optimization in spinning mill

UNIT II
Transportation problem – construction, initial basic feasible solution – North West Corner rule, lowest cost entry method, Vogel's Approximation Method; optimality test - MODI method, stepping stone method; replacement analysis

UNIT III
Assignment problem – construction, solution by Hungarian method, application in textile industry; sequencing problems; integer programming – construction, solving by cutting plane method

UNIT IV
Game theory- two person zero sum games, solving by matrix method, graphical method; Decisions theory - decisions under assumed certainty, decision under risk, decision under uncertainty, illustrations from textile industry; inventory control - EOQ models-deterministic models –probabilistic models

UNIT V
Project planning and control models: CPM, PERT – network representation, determining critical path, project duration; crashing of project duration; resource leveling

TOTAL : 45 PERIODS

REFERENCES
TT8753 TOTAL QUALITY MANAGEMENT FOR TEXTILE INDUSTRY L T P C
3 0 0 3

UNIT I INTRODUCTION

UNIT II TQM PRINCIPLES

UNIT III TQM TOOLS & TECHNIQUES I
The seven traditional tools of quality – New management tools – Six-sigma: Concepts, methodology, applications to spinning, weaving, chemical processing and garment industries – Bench marking – Reason to bench mark, Bench marking process – FMEA – Stages, Types

UNIT IV TQM TOOLS & TECHNIQUES II

UNIT V QUALITY SYSTEMS
– Leadership, Employee involvement – Motivation, Empowerment, Team and Teamwork, Recognition and Reward.

TOTAL : 45 PERIODS

REFERENCE BOOKS

TT8001 CHARACTERISATION OF POLYMERS

UNIT I MOLECULAR WEIGHT
Polymer solution thermo dynamics; molecular weight and molecular dimensions by end group analysis, osmometry, light scattering, viscometry, gel permeation chromatography, high performance liquid chromatography

UNIT II MOLECULAR STRUCTURE CHARACTERISATION
Infrared, NMR, UV –visible, raman spectroscopy, mass spectroscopy

UNIT III THERMAL PROPERTIES
Thermal properties by differential scanning calorimetry, differential thermal analysis, thermo gravimetry, thermo-mechanical analyzer, dynamic mechanical and di-electric analysis

UNIT IV CHROMATOGRAPHIC TECHNIQUES
Chromatographic techniques – adsorption chromatography – TLC, GC, LC – HPLC, GPC – hyphenated techniques
UNIT V  OTHERS

Optical and electron microscopy; SEM, TEM, X-ray scattering from polymers, birefringence, crystallinity by density measurements,

TOTAL : 45 PERIODS

REFERENCES

UNIT I


UNIT II

Rheological Behavior of Fluids- Rheology of Plastisols-Hydrodynamic Analysis of Coating,

Clothing Comfort- Impermeable Coating-Breathable Fabrics

UNIT III


UNIT IV

UNIT V
Test methods for coated fabric evaluation; environmental norms for the chemicals used in coating industry.

TOTAL : 45 PERIODS

REFERENCES

TT8003 HIGH PERFORMANCE FIBERS L T P C 3 0 0 3

UNIT I LINEAR POLYMER FIBRES
Aramid fibres - Polymer preparation, Spinning, Structure and properties and applications. Polyethylene fibres – Manufacture, Fibre characteristics, Properties, Yarn and fabric processing and applications.

UNIT II CARBON FIBRE
Manufacture of PAN-based, Pitch-based carbon fibres; physical properties and applications.

UNIT III GLASS AND CERAMIC FIBRES
Glass fibres - Fibre manufacture; fibre properties; glass-fibre composites and other applications. Manufacture of ceramic fibres; Silicon carbide-based fibres, other non-oxide fibres, Alumina-based fibres, other polycrystalline oxide fibres, Single-crystal oxide fibres

UNIT IV CHEMICAL AND THERMAL RESISTANCE FIBRES
Chlorinated fibres, fluorinated fibres, Polyetheretherketones, Polyphenylenesulphide, Polyetherimide, properties and applications. Thermo plastic and thermoset polymers, aromatic polyamides and polyaramids, semicarbon fibres, Polybenzimidazole.
UNIT V  SPECIALITY FIBRES
Speciality fibres - Hollow and profile fibres; blended and bi-component fibres; super absorbent fibres; film fibres

TOTAL : 45 PERIODS

REFERENCES

TT8004     LONG STAPLE SPINNING TECHNOLOGY     L T P C
8 0 0 3

UNIT I     FIBRE CLEANING AND BLENDING
Impurities in the long-staple fibre like wool and their removal; methods adopted to process raw flax and jute; blending methods followed for long staple fibres

UNIT II     FIBRE INDIVIDUALISATION
Fibre individualization in the carding machine; working principle and details of different type of carding machine-worsted carding, semi –worsted carding, woolen carding, flax carding and jute carding; card clothing and its maintenance; carding performance

UNIT III     COMBING
Objective of combing; basic principles of combing; details of wool combing preparation and combing operation; worsted top finishing

UNIT IV     DRAWING
Principle of long-staple drafting; effect of doubling; drafting irregularities; working details of worsted, semi worsted, jute and flax drawing; operating principle of roving machine
UNIT V YARN SPINNING

Mule spinning –drafting, twisting, backing-off, winding on; description of centrifugal spinning; flyer spinning; ring spinning – twisting, rings and ravelers; condenser yarn spinning; cap spinning; open end spinning –general features of rotor and friction spinning as applicable to long-staple fibres; double-rove spinning; self twist spinning system

TOTAL : 45 PERIODS

REFERENCES

TT8005 MEDICAL TEXTILES

UNIT I
Polymers and Textile-based techniques used for medical applications, Cell-Polymer interaction.

UNIT II

UNIT III
Extra-corporeal materials: Scaffolds for Tissue engineering, Rapid prototyping, Cartilages, Liver, Blood Vessel, Kidney, Urinary bladder, Tendons, Ligaments, Cornea,

UNIT IV
Healthcare and hygiene products: Surgical Gowns, masks, wipes, Antibacterial Textiles, Super absorbent polymers.
UNIT V
Safety, Legal and ethical issues involved in the medical textile materials

TOTAL : 45 PERIODS

REFERENCES

TT8006 TEXTILE COSTING L T P C
3 0 0 3

UNIT I
Cost accounting, elements of cost, classification of cost elements – examples from textile industry, methods of costing

UNIT II
Cost profit volume analysis, breakeven analysis; standard costing, analysis of variance

UNIT III
Costing of yarn – material, labour, power and overhead expenses, cost of fabric; costing of garment
UNIT IV
Foreign exchange mechanisms, exchange rates; foreign exchange exposure management – risks, strategies to reduce risk

UNIT V
Budget, types of budgets, budgeting and control in apparel industry

TOTAL : 45 PERIODS

REFERENCES

TT8007 TEXTILE REINFORCED COMPOSITES L T P C
3 0 0 3

UNIT I INTRODUCTION
Fiber reinforced polymers materials, properties; Resins - Thermoset and Thermo plastics / additives release agents; Composite material classification and its properties: Reinforcement – matrix interface wetability.

UNIT II PREPREGS AND PREFORMS
UNIT III  TECHNIQUES FOR MANUFACTURE OF COMPOSITES  
Introduction → manufacturing processes – open mould process, closed mould process and continuous process. Metal matrix composites, Ceramic matrix composites - types-importance and processing.

UNIT IV  MECHANICAL PROPERTIES OF TEXTILE COMPOSITES  

UNIT V  APPLICATION OF POLYMER COMPOSITES  
Composites application in aerospace, construction industry, and sports products. electrical, Polymer composite for biomedical and vibration damping.

TOTAL : 45 PERIODS

REFERENCES

TT8071  COLOUR SCIENCE  

UNIT I  LIGHT-MATTER INTERACTION  
The electromagnetic spectrum – the optical region, interaction of light with matter a) Transparent case – Beer’s Law and Lambert’s Law b) Opaque case – reflection absorption and scattering, the concept of “Radiative Transfer Theory” and its simplification into the Kubelka – Munk model.

UNIT II  HUMAN COLOUR VISION  
Colour Sensation – physiological and psychological mechanism of color vision, color vision...
theories, defects in color vision, color vision tests, additive and subtractive color mixing, confusion in color perception.

UNIT III  COLOUR ORDER SYSTEMS

Description of color, various color order systems, CIE numerical system for colour definition and its components – illuminants, the versions of the standard observer, the colour scales, chromaticity diagram.

UNIT IV  NUMERICAL COLOUR MATCHING

Reflectance and K/S value, relationship between dye concentrations and a) reflectance values and b) K/S values, reflectance and K/S curves of dyed samples, the CIE model for computer color matching and the calculation of colour recipes, non CIE models for colour matching, limitations of computer color matching

UNIT V  METAMERISM AND COLOUR DIFFERENCE ASSESSMENT

Metamerism – types and its assessment, metamerism in textile materials; colour differences – visual assessment, standard conditions, methods and problems, assessment of colour difference, the non linearity of subjective perception of colour, the need for specific colour difference systems, setting up of objective pass/fail standards.

TOTAL : 45 PERIODS

REFERENCES


87
UNIT I
Enterprise Resource Planning - principle, framework, application and suitability in garment production

UNIT II
Client/Server architecture; technology choices; SCM, CRM – concepts, Business Process Reengineering, Data ware Housing, Data mining

UNIT III
ERP system packages - SAP, Oracle People soft, BAAN; integration of different ERP applications; integrated Ecommerce, ERP and internet applications.

UNIT IV
ERP implementation strategies – organizational and social issues, data safety & security, ERP implementation in a garment production facility

UNIT V
ERP procurement issues – market trends – outsourcing ERP – economics – hidden cost issues, ROI

TOTAL : 45 PERIODS

REFERENCES
UNIT I
Human resource development systems - The Indian society in transition, understanding the concepts of HRD past, present and future, strategies adopted, structure, objectives and working of the HRD system in India and abroad, role of HR managers in textile and apparel industries.

UNIT II
Human resource planning – objectives of planning on the macro level, demand forecasting of HR planning, MIS in HR planning, future skill mapping, human resource outsourcing, recruitment and processes involved in textile and apparel industries, induction; training objectives, methods, carrier planning, performance and potential appraisal.

UNIT III
Job analysis, description, evaluation, enrichment; Performance measurement- objectives, methods, multi-skill development, motivation. Organised labour, understanding groups, development, cohesion, alienation, group work behaviour & managing international work force.

UNIT IV
Compensation, wage policy, industrial pay-structure, types, components, laws and methods of payment; methods of wage fixation in a textile mill and apparel units; laws governing employee benefits and welfare, incentives, overtime, bonus, cost to the company.

UNIT V
Different Acts governing labour welfare and employment; employee discipline- disciplinary actions, procedures, suspension, dismissal and retrenchment, role of trade unions, collective bargaining, industrial democracy and workers participation in management, related case studies.

TOTAL : 45 PERIODS

REFERENCES

TT8074 PRODUCTION AND OPERATIONS MANAGEMENT L T P C

UNIT I
Factors of production; environmental and social concerns of operations; design of production system; forecasting in production and operation management – various qualitative and quantitative techniques

UNIT II
Capacity planning; facility planning – objectives; different types of layouts, developing process layout, product layout; job design techniques

UNIT III
Aggregate production planning – procedure, importance; scheduling in operation management – mass production system, batch and job shop

UNIT IV
Material management – material planning, purchase, stores, material handling and disposal; inventory models; MRP-objectives, elements of MRP, MRP computation, implementation

UNIT V
Concepts - Total Productive Maintenance, Just In Time, Total Quality Management; Automated Technology, CIM, CAD, FMS, GT, CAM, CAPP

TOTAL : 45 PERIODS

REFERENCES
5. Narasimhan S.L., Mcleavy, D.W. and Billington P.J., “Production Planning and Inventory Control”, Prentice Hall of India, New Delhi, 1997

TT8075 SUPPLY CHAIN MANAGEMENT FOR TEXTILE INDUSTRY L T P C 3 0 0 3

UNIT I
Basic principles of supply chain management and logistics, supply chain models, supply chain for volatile market; supply chain drivers and metrics in apparel industries; roll of supply chain in the textile and apparel industries’ financial stability.

UNIT II
Planning supply and demand in apparel production house, managing economies of scale, supply cycle and inventory levels; managing uncertainty in supply chain, safety pricing and inventory; make Vs buy decision, make Vs hire decision; geographical identification of suppliers, supplier evaluation, supplier selection, contract negotiations and finalisation.

UNIT III
Distribution network and design for global textile and apparel products, models of distribution – facility location and allocation of capacity, uncertainty on design and network optimisation; the role of transportation in supply chain, modes of transportation, characteristics of transportation, transport design options for global textile and apparel network, trade-off in transport design, risk management in transportation, transport decision in practice for textile and apparel industries.

UNIT IV
Coordination in supply chain- the bullwhip effect, forecasting, obstacles to coordination in supply chain; supply chain management for apparel retail stores, high fashion fad; supply chain in e-business and b2b practices
UNIT V
Import - Export management, documentation, insurance, packing and foreign exchange; methods of payments – domestic, international, commercial terms; dispute handling modes and channels; supply chain and Information system; Customer relationship management

TOTAL : 45 PERIODS

REFERENCES

TT8076 TEXTILE AND APPAREL EXIM MANAGEMENT L T P C
3 0 0 3

UNIT I
International markets for yarns, woven fabrics; international market for cotton, silk, jute, wool and other fibres; export and import of textiles by India – current status, promotional activities

UNIT II
International markets for carpets and home textiles – product types, market potential and statistics, India - current status and promotional activities, role of export promotional councils

UNIT III
International markets for woven piece goods, knitted garments, leather garments; statistics of international apparel market and trade; export incentives, role of AEPC, CII, FIEO, Textile Committee

UNIT IV
Marketing – strategies, global brand building; logistics & SCM; role of export finances & EXIM banking, ECGC, Indian council of arbitration, FERA; impact of foreign trade on Indian economy
UNIT V
Exim policy - customs act, acts relating to export/import of textile and apparel; Indian customs formalities - export documentation for excisable goods, import documentation, clearance of import goods; concepts - 100% export oriented units, export processing zones, special economic zones; duty drawback procedure; import/export incentives; licenses; case study

TOTAL : 45 PERIODS

REFERENCES

GE8751 ENGINEERING ETHICS AND HUMAN VALUES L T P C 3 0 0 3

UNIT I HUMAN VALUES

UNIT II ENGINEERING ETHICS
UNIT III  ENGINEERING AS SOCIAL EXPERIMENTATION  9
Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law – The Challenger Case Study

UNIT IV  SAFETY, RESPONSIBILITIES AND RIGHTS  9


UNIT V  GLOBAL ISSUES  8

TOTAL: 45 PERIODS

TEXTBOOK

REFERENCES

WEB SOURCES
1. www.onlineethics.org
2. www.nspe.org
3. www.globalethics.org
4. www.ethics.org
UNIT I
An overview on smart textiles, electrically active polymers materials- application of non ionic polymer gel and elastomers for artificial muscles. Heat storage and thermo regulated textiles and clothing, Thermally sensitive materials, Cross – linked polymers of fiber substrates as multifunctional and multi use intelligent material. Mechanical properties of fiber bragg gratings, optical responses of FBG (Fiber Bragg grating) sensors under deformation. Smart textile composites integrated with optic sensors.

UNIT II
Adaptive and responsive textile structures, bioprocessing for smart textiles and clothing, Tailor made intelligent polymers for biomedical application

UNIT III
Smart fabrics – passive, active, very smart – classification of smart materials, concept of wearable computing, basic structure of fabric used for integrating different electronic sensors

UNIT IV
Smart Interactive garments for combat training, for hospital and patient care, smart garments in sports and fitness activities, smart garments for children, smart home textiles.

TOTAL : 45 PERIODS

REFERENCES
1. Edited by Sanjay Gupta, “Smart Textiles their Production and Marketing Strategies”, NIFT, New Delhi, 2000
UNIT I  FABRIC INSPECTION AND SPREADING MACHINES 9

UNIT II  CUTTING MACHINES 9
Mechanism of straight knife cutting machines, rotary cutting machines, band knife cutting machines, die cutting, laser cutting, plasma cutting, water jet cutting and ultra sonic cutting; Notches, drills and thread markers; Computer interfaced cutting machines.

UNIT III  SEWING MACHINES 9
Sewing machines – primary and secondary components; Working principle, stitch formation and timing diagram - lock stitch and chain stitch; single needle and double needle lock stitch mechanism: needle bar, hook – rotary and feed mechanism; Needles – geometry, types and selection

UNIT IV  SPECIAL SEWING MACHINES 9
Over lock, Flatlock, Feed off arm, button fixing and button holing; Embroidery machines – mechanism and stitch formation; Sewing machines feed mechanisms; sewing machine attachments

UNIT V  FINISHING MACHINES 9
Molding machineries; Shrinking machineries – London shrinking, hot-water shrinking, steam shrinking and compaction shrinkage; Pressing machineries – buck pressing, iron pressing, block or die pressing, form pressing, steamers and advanced pressing machineries; Pleating – principles and mechanics machineries

TOTAL : 45 PERIODS

REFERENCES
UNIT I
Garment components and trimmings – labels and motifs, linings, interlining wadding, lace, braid and elastic, seam binding and tape, shoulder pads, eyelets and laces, zip fasteners, buttons – tack buttons, snap fastener and rivets; buckles, frag closures, belts, ribbons, fringe, emblems and sequins, decorative and functional trimmings; performance properties of components and trims.

UNIT II
Hook and loop fastening (Velcro), Zippers – anatomy of zipper, types, function of zipper, position of slider, standards on zipper, selection of zipper, application of zipper, shortening of zipper; evaluation of quality of accessories

UNIT III
Embroideries - basic embroidery stitches – chain stitch, button hole stitch, herringbone stitch, feather stitch, lazy daisy, double knot stitch, interlacing stitch, stem stitch, French knot stitch, types of embroidery machines, limitations of hand embroidery; kaustic embroidery; kasida, kathiwar; Sind; chickankari; zardosai; tribal embroideries.

UNIT IV
Fashion accessories – footwear, handbags, gloves, hats, scarves, hosiery, jewelry, watches; testing of zippers, elastic waist band testing, fusible interlinings; safety issues for different accessories in children garment.

UNIT V
Printing – introduction; different methods – block printing, roller, screen, discharge, resist and pigment; styles of printing - batik, tie and dye, patch work, appliqué work, bead work

TOTAL : 45 PERIODS

REFERENCES
UNIT I
Sewing thread – requirements and characteristics - sewability of the thread, seam efficiency index, tensile properties, abrasion resistance, friction, heat resistance, shrinkage, snarling tendency. fastness, mass evenness.

UNIT II
Types of sewing thread – spun threads, core spun threads, filament threads; sewing thread production method; characteristics and application of high performance sewing threads - aramid threads, ceramic threads, polypropylene threads, polyethylene threads, polytetrafluoroethylene threads, fiberglass threads, other sewing threads – tencel, acrylic, linen, elastic, soluble; embroidery threads.

UNIT III
Ticket number in sewing threads; testing of sewing threads – physical and chemical properties; sewing performance – control of missing stitches and seam puckering, factors affecting seam strength.

UNIT IV
Selection of sewing thread for different end uses

TOTAL: 45 PERIODS

REFERENCES
UNIT I
Industrial Engineering - evolution, functions, role of industrial engineer

UNIT II
Methods study – introduction, techniques of recording; method analysis techniques; principles of motion economy; method study in garment manufacture; ergonomics- importance, workplace design, fatigue

UNIT III
Work measurement – introduction; time study – equipment and procedure; standard data; predetermined time standards; work sampling techniques; incentive wage system; work measurement applied to garment industry

UNIT IV
Site selection for textile industry; plant layout - types of layouts suitable for textile industry, methods to construct layout; line balancing

UNIT V
Statistical Process Control – data collection; concept of AQL, control charts in quality control; process capability

TOTAL : 45 PERIODS

REFERENCES

AT8652
PROTECTIVE GARMENTS

UNIT I FIBRES, YARNS AND FABRICS FOR PROTECTIVE GARMENTS 9
Characteristic requirements of fiber, yarn and fabric for flame proof, heat resistant, ballistic resistance, electrical conduction, bacterial protection, radiation protection and radiation contamination protection

UNIT II CHEMICAL FINISHES FOR PROTECTIVE FABRICS 9
Mechanism, Chemistry, Materials and methods - Flame retardant, Liquid repellent, Antistatic, Antibacterial, UV protection and mite protection finishes

UNIT III PROTECTIVE FABRICS IN DIFFERENT APPLICATIONS 9
Protective fabrics used in the medical field and in hygiene; military combat clothing; protective fabrics against biological and chemical warfare; textiles for high visibility

UNIT IV PROTECTIVE GARMENT CONSTRUCTION 9
Garment construction - method of construction of garments according to various protective end uses; use of accessories for protective garment

UNIT V EVALUATION OF PROTECTIVE GARMENTS 9
Standards and test method for protective fabric performance - Flame retardant finishes, Liquid repellent finishes, Antistatic, Liquid repellent, antibacterial, UV protection, mite protection; Materials and methods. Manikins – Thermal manikins, segmented thermal manikins, evaporative resistance measurement- moisture permeability index, skin model, Concept of
dynamic manikins; Permeation resistance test – index of penetration and index of repellency; Liquid tight integrity and gas tight integrity; Ergonomics of protective clothing

TOTAL : 45 PERIODS

REFERENCES

AT8751 APPAREL MARKETING AND MERCHANDISING L T P C 3 0 0 3

UNIT I INTRODUCTION TO APPAREL BUSINESS
International apparel business pattern, basic business concepts in Indian apparel export house, business operations in China and other south Asian countries. Business patterns for Indian apparel retail and home textiles. Understanding from concept board to finished product and its sequence.
UNIT II MARKETING FOR APPAREL AND TEXTILE PRODUCTS

Defining marketing, marketing mix the objectives of marketing department, market research, different types of markets, marketing strategies with respect to a product/brand, Indian apparel houses international marketing strategies and domestic marketing strategies, marketing models, B to B marketing, B to C marketing, direct marketing, digital marketing.

UNIT III MERCHANDISING

Concepts of merchandising, concepts and apparel product lines, dimensions of product change, determination and development of product line and product range. Creative and technical design in garments and accessories, new product development and seasons of sale, costing, coordination and communication with the production house and export house.

UNIT IV SOURCING

Understanding the basics of sourcing, sourcing strategy and best sourcing practice in apparel and textile businesses, supply chain and demand chain understanding, sourcing negotiations, global co-ordination in sourcing, materials management and quality in sourcing, quick response and supplier partnership in sourcing, JIT technology.

UNIT V EXPORT DOCUMENTATION AND POLICIES.


TOTAL : 45 PERIODS

REFERENCES


GE8072 DISASTER MANAGEMENT

OBJECTIVES:

- To provide students an exposure to disasters, their significance and types.
• To ensure that students begin to understand the relationship between vulnerability, disasters, disaster prevention and risk reduction
• To gain a preliminary understanding of approaches of Disaster Risk Reduction (DRR)
• To enhance awareness of institutional processes in the country and
• To develop rudimentary ability to respond to their surroundings with potential disaster response in areas where they live, with due sensitivity

UNIT I  INTRODUCTION TO DISASTERS  9
Definition: Disaster, Hazard, Vulnerability, Resilience, Risks – Disasters: Types of disasters – Earthquake, Landslide, Flood, Drought, Fire etc - Classification, Causes, Impacts including social, economic, political, environmental, health, psychosocial, etc.- Differential impacts- in terms of caste, class, gender, age, location, disability - Global trends in disasters: urban disasters, pandemics, complex emergencies, Climate change- Dos and Don’ts during various types of Disasters.

UNIT II  APPROACHES TO DISASTER RISK REDUCTION (DRR)  9
Disaster cycle - Phases, Culture of safety, prevention, mitigation and preparedness community based DRR, Structural- nonstructural measures, Roles and responsibilities of- community, Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs), States, Centre, and other stakeholders- Institutional Processess and Framework at State and Central Level- State Disaster Management Authority(SDMA) – Early Warning System – Advisories from Appropriate Agencies.

UNIT III  INTER-RELATIONSHIP BETWEEN DISASTERS AND DEVELOPMENT  9
Factors affecting Vulnerabilities, differential impacts, impact of Development projects such as dams, embankments, changes in Land-use etc.- Climate Change Adaptation- IPCC Scenario and Scenarios in the context of India - Relevance of indigenous knowledge, appropriate technology and local resources.

UNIT IV  DISASTER RISK MANAGEMENT IN INDIA  9
Hazard and Vulnerability profile of India, Components of Disaster Relief: Water, Food, Sanitation, Shelter, Health, Waste Management, Institutional arrangements (Mitigation, Response and Preparedness, Disaster Management Act and Policy - Other related policies, plans, programmes and legislation – Role of GIS and Information Technology Components in Preparedness, Risk Assessment, Response and Recovery Phases of Disaster – Disaster Damage Assessment.

UNIT V  DISASTER MANAGEMENT: APPLICATIONS AND CASE STUDIES AND FIELD WORKS  9
Landslide Hazard Zonation: Case Studies, Earthquake Vulnerability Assessment of Buildings and Infrastructure: Case Studies, Drought Assessment: Case Studies, Coastal Flooding: Storm Surge Assessment, Floods: Fluvial and Pluvial Flooding: Case Studies; Forest Fire: Case Studies, Man Made disasters: Case Studies, Space Based Inputs for Disaster Mitigation and Management and field works related to disaster management.

TOTAL: 45 PERIODS
OUTCOMES:
The students will be able to
- Differentiate the types of disasters, causes and their impact on environment and society
- Assess vulnerability and various methods of risk reduction measures as well as mitigation.
- Draw the hazard and vulnerability profile of India, Scenariouos in the Indian context,
- Disaster damage assessment and management.

TEXTBOOKS:

REFERENCES
1. Govt. of India: Disaster Management Act , Government of India, New Delhi, 2005

GE8073 HUMAN RIGHTS L T P C
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OBJECTIVES:
- To sensitize the Engineering students to various aspects of Human Rights.

UNIT I

UNIT II

UNIT III
Theories and perspectives of UN Laws – UN Agencies to monitor and compliance.

UNIT IV
Human Rights in India – Constitutional Provisions / Guarantees.
UNIT V

TOTAL : 45 PERIODS

OUTCOME :
• Engineering students will acquire the basic knowledge of human rights.

REFERENCES: