Program Educational Objectives: (PEOs)
Bachelor of Apparel Technology curriculum is designed to prepare the graduates having attitude and knowledge to

I. Have successful professional and technical career
II. Have strong foundation in basic sciences, mathematics and management
III. Have knowledge on the theory and practices in the field of Apparel Technology and allied areas
IV. Engross in life-long learning to keep themselves abreast of new developments
V. Practice and inspire high ethical values and technical standards

Program Outcome: (POs)
1. Ability to apply knowledge of mathematics, sciences and Technology
2. Ability to apply knowledge on basics of yarn, fabric manufacture, chemical processing and testing of textiles in garment manufacture
3. Ability to understand and apply basic pattern engineering concepts, merchandising and marketing, sewing production, woven and knitted fabric design skills
4. Ability to identify and solve technological problems in Garment Industry
5. Ability to analyze and apply knowledge in the field of design and production of apparels and ability to understand and apply computational platforms and software tools for pattern making and marker planning applications
6. Ability to understand ethical and professional responsibilities
7. Ability to communicate effectively and work in interdisciplinary groups
8. Ability to review, comprehend and report technological development
### Mapping of Programme Educational Objective with Programme Outcomes

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**EMPLOYABILITY ENHANCEMENT COURSES (EEC)**

1. Technical Seminar
2. Industrial Training*
3. Basic Sewing Laboratory
4. Project work

**PROFESSIONAL ELECTIVES (PE)**

1. Apparel Accessories and Embellishments
2. Production and Application of Sewing Threads
3. Protective Textiles
4. Operations Research for Textile Industry
5. Total Quality Management for Textile Industry
6. Clothing Comfort
7. Brand Management
8. Home Textiles
9. Intimate Apparels
10. Quality Evaluation of Fibres and Yarns
11. Smart Textiles
12. Engineering Ethics and Human Values
13. Colour Science
15. Production and Operation Management
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ANNA UNIVERSITY, CHENNAI  
UNIVERSITY DEPARTMENTS  
B.TECH. APPAREL TECHNOLOGY  
REGULATIONS – 2015  
CHOICE BASED CREDIT SYSTEM  
CURRICULA AND SYLLABI I – VIII SEMESTERS

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**Director**  
Centre For Academic Courses  
Anna University, Chennai-600 025
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COURSE DESCRIPTION:
This course aims at developing the language skills necessary for the first year students of Engineering and Technology.

OBJECTIVES:
- To develop the four language skills – Listening, Speaking, Reading and Writing.
- To improve the students' communicative competence in English.
- To teach students the various aspects of English language usage.

CONTENTS

UNIT I  GREETING AND INTRODUCING ONESELF  12
Listening- Types of listening – Listening to short talks, conversations; Speaking – Speaking about one’s place, important festivals etc. – Introducing oneself, one’s family/ friend; Reading – Skimming a passage– Scanning for specific information; Writing- Guided writing - Free writing on any given topic ( My favourite place/ Hobbies/ School life, writing about one’s leisure time activities, hometown, etc.); Grammar – Tenses (present and present continuous) -Question types - Regular and irregular verbs; Vocabulary – Synonyms and Antonyms.

UNIT II  GIVING INSTRUCTIONS AND DIRECTIONS  12
Listening – Listening and responding to instructions; Speaking – Telephone etiquette - Giving oral instructions/ Describing a process – Asking and answering questions; Reading – Reading and finding key information in a given text - Critical reading - Writing – Process description( non-technical)- Grammar – Tense (simple past& past continuous) - Use of imperatives – Subject – verb agreement – Active and passive voice; Vocabulary – Compound words – Word formation – Word expansion ( root words).

UNIT III  READING AND UNDERSTANDING VISUAL MATERIAL  12
Listening- Listening to lectures/ talks and completing a task; Speaking –Role play/ Simulation – Group interaction; Reading – Reading and interpreting visual material; Writing- Jumbled sentences – Discourse markers and Cohesive devices – Essay writing (cause & effect/ narrative); Grammar – Tenses (perfect), Conditional clauses –Modal verbs; Vocabulary – Cause and effect words; Phrasal verbs in context.

UNIT IV  CRITICAL READING AND WRITING  12
Listening- Watching videos/ documentaries and responding to questions based on them; SpeakingInformal and formal conversation; Reading –Critical reading (prediction & inference); Writing–Essay writing ( compare & contrast/ analytical) – Interpretation of visual materials; Grammar – Tenses (future time reference); Vocabulary – One word substitutes (with meanings) – Use of abbreviations & acronyms – Idioms in sentences.

UNIT V  LETTER WRITING AND SENDING E-MAILS  12
Listening- Listening to programmes/broadcast/ telecast/ podcast; Speaking – Giving impromptu talks, Making presentations on given topics- Discussion on the presentation; Reading –Extensive reading; Writing- Poster making – Letter writing (Formal and E-mail); Grammar – Direct and Indirect speech – Combining sentences using connectives; Vocabulary –Collocation;

TEACHING METHODS:
Interactive sessions for the speaking module.
Use of audio – visual aids for the various listening activities.
Contextual Grammar Teaching.

EVALUATION PATTERN:
Internals – 50%
End Semester – 50%

TOTAL : 60 PERIODS
LEARNING OUTCOMES:
- Students will improve their reading and writing skills
- Students will become fluent and proficient in communicative English
- Students will be able to improve their interpersonal communication

TEXTBOOK:

REFERENCES:

MA7151 MATHEMATICS – I  L  T  P  C
4  0  0  4
(Common to all branches of B.E. / B.Tech. Programmes in I Semester)

OBJECTIVES
- The goal of this course is for students to gain proficiency in calculus computations. In calculus, we use three main tools for analyzing and describing the behavior of functions: limits, derivatives, and integrals. Students will use these tools to solve application problems in a variety of settings ranging from physics and biology to business and economics.
- To make the student acquire sound knowledge of techniques in solving ordinary differential equations that model engineering problems.
- To familiarize the student with functions of several variables. This is needed in many branches of engineering.
- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their usage.

UNIT I DIFFERENTIAL CALCULUS 12
- Representation of functions
- New functions from old functions
- Limit of a function
- Limits at infinity
- Continuity
- Derivatives
- Differentiation rules
- Polar coordinate system
- Differentiation in polar coordinates
- Maxima and Minima of functions of one variable.

UNIT II FUNCTIONS OF SEVERAL VARIABLES 12
- Partial derivatives
- Homogeneous functions and Euler’s theorem
- Total derivative
- Differentiation of implicit functions
- Change of variables
- Jacobians
- Partial differentiation of implicit functions
- Taylor’s series for functions of two variables
- Errors and approximations
- Maxima and minima of functions of two variables
- Lagrange’s method of undetermined multipliers.

UNIT III INTEGRAL CALCULUS 12
- Definite and Indefinite integrals
- Substitution rule
- Techniques of Integration
- Integration by parts
- Trigonometric integrals
- Trigonometric substitutions
- Integration of rational functions by partial fraction
- Integration of irrational functions
- Improper integrals.
UNIT IV  MULTIPLE INTEGRALS

UNIT V  DIFFERENTIAL EQUATIONS
Method of variation of parameters – Method of undetermined coefficients – Homogeneous equation of Euler’s and Legendre’s type – System of simultaneous linear differential equations with constant coefficients.

TOTAL : 60 PERIODS

OUTCOMES
- Understanding of the ideas of limits and continuity and an ability to calculate with them and apply them.
- Improved facility in algebraic manipulation.
- Fluency in differentiation.
- Fluency in integration using standard methods, including the ability to find an appropriate method for a given integral.
- Understanding the ideas of differential equations and facility in solving simple standard examples.

TEXT BOOKS

REFERENCES

PH7151  ENGINEERING PHYSICS
(Common to all branches of B.E / B.Tech programmes)  L T P C  3 0 0 3

OBJECTIVE:
- To introduce the concept and different ways to determine moduli of elasticity and applications.
- To instill the concept of sound, reverberation, noise cancellation, and ultrasonic generation, detection and applications
- To inculcate an idea of thermal properties of materials, heat flow through materials and quantum physics
- To promote the basic understanding of interferometers, principles and applications of lasers, optical fibers and sensors
- To establish a sound grasp of knowledge on the basics, significance and growth of single crystals
UNIT I PROPERTIES OF MATTER


UNIT II ACOUSTICS AND ULTRASONICS


UNIT III THERMAL AND MODERN PHYSICS


UNIT IV APPLIED OPTICS


UNIT V CRYSTAL PHYSICS

Single crystalline, polycrystalline and amorphous materials – Single crystals: unit cell, crystal systems, Bravais lattices, ditections and planes in a crystal, Miller indices - interplanar distance for a cubic crystal - coordination number and packing factor for SC, BCC, FCC, HCP and diamond structures - structure and significance of NaCl, CsCl, ZnS and graphite - crystal imperfections: point defects, line defects – Burger vectors, dislocations and stacking faults – Growth of single crystals: Bridgman and Czochralski methods.

OUTCOME:
• The students will understand different moduli of elasticity, their determination and applications.
• The students will gain knowledge on the properties of sound, noise cancellation, and production, detection and applications of ultrasonics
• The students will acquire sound knowledge on thermal expansion and thermal conductivity of materials. Further they will gain an idea of quantum physics.
• The students will gain knowledge on interferometers, lasers and fiber optics
• The students will secure knowledge on the basics of crystal structures and their significance. Further they gain basic ideas of growing single crystals.

TEXTBOOKS:

REFERENCES:

**CY7151 ENGINEERING CHEMISTRY**

**COURSE OBJECTIVES**
- To develop an understanding about fundamentals of polymer chemistry.
- Brief elucidation on surface chemistry and catalysis.
- To develop sound knowledge photochemistry and spectroscopy.
- To impart basic knowledge on chemical thermodynamics.
- To understand the basic concepts of nano chemistry.

**UNIT I POLYMER CHEMISTRY**
9
Introduction: Functionality-degree of polymerization. Classification of polymers- natural and synthetic, thermoplastic and thermosetting. Types and mechanism of polymerization: addition (free radical, cationic, anionic and living); condensation and copolymerization. Properties of polymers: Tg, tacticity, molecular weight-weight average, number average and polydispersity index. Techniques of polymerization: Bulk, emulsion, solution and suspension.

**UNIT II SURFACE CHEMISTRY AND CATALYSIS**
9

**UNIT III PHOTOCHEMISTRY AND SPECTROSCOPY**
9

**UNIT IV CHEMICAL THERMODYNAMICS**
9
Second law: Entropy-entropy change for an ideal gas, reversible and irreversible processes; entropy of phase transitions; 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 V NANO CHEMISTRY**
9

**TOTAL : 45 PERIODS**

**COURSE OUTCOMES**
- Will be familiar with polymer chemistry, surface chemistry and catalysis.
- Will know the photochemistry, spectroscopy and chemical thermodynamics.
Will know the fundamentals of nano chemistry.

TEXT BOOKS

REFERENCES

GE7152 ENGINEERING GRAPHICS

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

CONCEPTS AND CONVENTIONS (NOT FOR EXAMINATION)
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 HANDSKETCHING
Basic Geometrical constructions, Curves used in engineering practices-Conics – Construction of ellipse, parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square and circle – Drawing of tangents and normal to the above curves. 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
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
Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to both the principal planes by rotating object method and auxiliary plane method.

UNIT IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES
Sectioning of 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
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)**

Introduction to drafting packages and demonstration of their use.

L=45+T=30, TOTAL: 75 PERIODS

**OUTCOMES:**

On Completion of the course the student will be able to

- Perform free hand sketching of basic geometrical shapes and multiple views of objects.
- Draw orthographic projections of lines, Planes and Solids
- Obtain development of surfaces.
- Prepare isometric and perspective views of simple solids.

**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. The students will be permitted to use appropriate scale to fit solution within A3 size.
4. The examination will be conducted in appropriate sessions on the same day.
PHYSICS LABORATORY: (Any Seven Experiments)

OBJECTIVE:
- To inculcate experimental skills to test basic understanding of physics of materials including properties of matter, thermal and optical properties.
- To induce the students to familiarize with experimental determination of velocity of ultrasonic waves, band gap determination and viscosity of liquids.

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. Uniform bending – Determination of young’s modulus
4. Lee’s disc Determination of thermal conductivity of a bad conductor
5. Potentiometer-Determination of thermo e.m.f of a thermocouple
6. Laser- Determination of the wave length of the laser using grating
7. Air wedge - Determination of thickness of a thin sheet/wire
8. a) Optical fibre -Determination of Numerical Aperture and acceptance angle
   b) Compact disc- Determination of width of the groove using laser.
10. Ultrasonic interferometer – determination of the velocity of sound and compressibility of liquids
11. Post office box -Determination of Band gap of a semiconductor.
13. Viscosity of liquids - Determination of co-efficient of viscosity of a liquid by Poiseuille’s flow

TOTAL: 30 PERIODS

OUTCOME:
Upon completion of the course, the students will be able
- To determine various moduli of elasticity and also various thermal and optical properties of materials.
- To determine the velocity of ultrasonic waves, band gap determination and viscosity of liquids.

CHEMISTRY LABORATORY:
(Minimum of 8 experiments to be conducted)
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 Iodometry.
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-Phenanthrolino/thiocyanate method).
10. Estimation of sodium and potassium present in water using flame photometer.
12. Pseudo first order kinetics-ester hydrolysis.
14. Determination of CMC.
15. Phase change in a solid.

TOTAL: 30 PERIODS

TEXTBOOKS
COURSE OBJECTIVES

- 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 PRACTICES

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.
- Laying pipe connection to the delivery side of a pump.
- Practice in connecting pipes of different materials: Metal, plastic and flexible pipes used in household appliances.

WOOD WORK
- Sawing, planing and making joints like T-Joint, Mortise and Tenon joint and Dovetail joint.

STUDY
- Study of joints in door panels and wooden furniture
- Study of common industrial trusses using models.

2. ELECTRICAL ENGINEERING PRACTICES

- Basic household wiring using Switches, Fuse, Indicator and Lamp etc.,
- Stair case light wiring
- Tube – light wiring
- Preparation of wiring diagrams for a given situation.
- Study of Iron-Box, Fan Regulator and Emergency Lamp

GROUP – B (MECHANICAL AND ELECTRONICS)

3. MECHANICAL ENGINEERING PRACTICES

WELDING
- Arc welding of Butt Joints, Lap Joints, and Tee Joints
- Gas welding Practice.
- Basic Machining - Simple turning, drilling and tapping operations.
- Study and assembling of the following:
  a. Centrifugal pump
  b. Mixie
  c. Air Conditioner.

DEMONSTRATION ON FOUNDRY OPERATIONS.

4. ELECTRONIC ENGINEERING PRACTICES

- Soldering simple electronic circuits and checking continuity.
- Assembling electronic components on a small PCB and Testing.
- Study of Telephone, FM radio and Low Voltage Power supplies.

TOTAL: 60 PERIODS
COURSE OUTCOMES
- Ability to fabricate carpentry components and to lay pipe connections including plumbing works.
- Ability to use welding equipments to join the structures
- Ability to do wiring for electrical connections and to fabricate electronics circuits.

HS7251 TECHNICAL ENGLISH L T P C
4 0 0 4

OBJECTIVES
- To enable students acquire proficiency in technical communication.
- To enhance their reading and writing skills in a technical context.
- To teach various language learning strategies needed in a professional environment.

CONTENTS
UNIT I ANALYTICAL READING 12
Listening- Listening to informal and formal conversations; Speaking – Conversation Skills(opening, turn taking, closing )-explaining how something works-describing technical functions and applications;Reading –Analytical reading, Deductive and inductive reasoning; Writing- vision statement-structuring paragraphs.

UNIT II SUMMARISING 12
Listening- Listening to lectures/ talks on Science & Technology;Speaking –Summarizing/ Oral Reporting, Reading – Reading Scientific and Technical articles; Writing- Extended definition –Lab Reports – Summary writing.

UNIT III DESCRIBING VISUAL MATERIAL 12
Listening- Listening to a panel discussion; Speaking – Speaking at formal situations; Reading – Reading journal articles - Speed reading;Writing-data commentary-describing visual material-writing problem-process- solution-the structure of problem-solution texts- writing critiques

UNIT IV WRITING/ E-MAILING THE JOB APPLICATION 12
Listening- Listening to/ Viewing model interviews; Speaking –Speaking at different types of interviews – Role play practice (mock interview); Reading – Reading job advertisements and profile of the company concerned;Writing- job application – cover letter –Résumé preparation.

UNIT V REPORT WRITING 12
Listening- Viewing a model group discussion; Speaking –Participating in a discussion - Presentation;Reading – Case study - analyse -evaluate – arrive at a solution; Writing– Recommendations- Types of reports (feasibility report)- designing and reporting surveys- – Report format.- writing discursive essays.

TEACHING METHODS:
Practice writing
Conduct model and mock interview and group discussion.
Use of audio – visual aids to facilitate understanding of various forms of technical communication. Interactive sessions.

EVALUATION PATTERN:
Internals – 50%
End Semester – 50%
TOTAL:60 PERIODS

LEARNING OUTCOMES
- Students will learn the structure and organization of various forms of technical communication.
- Students will be able to listen and respond to technical content.
- Students will be able to use different forms of communication in their respective fields.
TEXTBOOK:

REFERENCES:

MA7251 MATHEMATICS – II

OBJECTIVES
- To develop the use of matrix algebra techniques this is needed by engineers for practical applications.
- 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 the 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 MATRICES

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

UNIT III ANALYTIC FUNCTION
Analytic functions – Necessary and sufficient conditions for analyticity - Properties – Harmonic conjugates – Construction of analytic function - Conformal mapping – Mapping by functions \( w = z+c, \ az, \ \frac{1}{z} \) - Bilinear transformation.

UNIT IV COMPLEX INTEGRATION
Line integral - Cauchy’s integral theorem – Cauchy’s integral formula – Taylor’s and Laurent’s series – Singularities – Residues – Residue theorem – Application of residue theorem for evaluation of real integrals – Use of circular contour and semicircular contour with no pole on real
UNIT V  LAPLACE TRANSFORMS

TOTAL : 60 PERIODS

OUTCOMES
Upon successful completion of the course, students should be able to:
- Evaluate real and complex integrals using the Cauchy integral formula and the residue theorem
- Appreciate how complex methods can be used to prove some important theoretical results.
- Evaluate line, surface and volume integrals in simple coordinate systems
- Calculate grad, div and curl in Cartesian and other simple coordinate systems, and establish identities connecting these quantities
- Use Gauss, Stokes and Greens theorems to simplify calculations of integrals and prove simple results.

TEXT BOOKS

REFERENCES

PH7257 PHYSICS OF MATERIALS L T P C 3 0 0 3
(Common to Chemical, Ceramic, Food, Leather, Textile, Apparel, Industrial Biotechnology, Pharmaceutical and PET)

OBJECTIVE:
- To make the students to understand the basics of phase diagrams and various materials preparation techniques
- To equip the students to have a knowledge on different types of electron theory, basics of quantum mechanics and about superconductors
- To introduce the physics of semiconducting materials and applications of semiconductors in device fabrication
- To familiarize the students with the theory and applications of magnetic and dielectric materials
- To provide the students a sound platform towards learning about advanced materials and their applications.
UNIT I  PREPARATION OF MATERIALS  9

UNIT II  ELECTRICAL AND SUPERCONDUCTING MATERIALS  9

UNIT III  SEMICONDUCTING MATERIALS  9

UNIT IV  DIELECTRIC AND MAGNETIC MATERIALS  9

UNIT V  NEW MATERIALS AND APPLICATIONS  9

TOTAL: 45 PERIODS

OUTCOME:
On completion of the course, the students will be able to
- acquire knowledge of phase diagram, and thin film and nanomaterial preparation techniques
- familiarize with conducting materials, basic quantum mechanics, and properties and applications of superconductors.
- gain knowledge on semiconducting materials based on energy level diagrams, its types, temperature effect. Also, fabrication methods for semiconductor devices will be understood.
- realize with theories and applications of dielectric and ferromagnetic materials
- familiarize with ceramics, composites, metallic glasses, shape memory alloys, biomaterials and their important applications.

REFERENCES:
Cy7255

Chemistry for Technologists

L T P C
3 0 0 3

Objective

- The students should be conversant with
- Boiler feed water requirements, water treatment techniques,
- Applications of oil and its properties, principles of different chemical analysis.
- Different kinds of preparations of important chemicals.

Outcome

- Will be familiar with boiler feed water requirements, water treatment techniques.
- Will know the oil and its properties, principles of different chemical analysis.
- Will know the preparations of important chemicals.

Unit I Water Technology

Water quality parameters - hardness - definition - units of hardness - determination of hardness (EDTA method), Alkalinity - definition - determination of alkalinity, TDS, BOD, COD and iron and their significance. Softening - zeolite and demineralization processes. Boiler troubles (scale, sludge, boiler corrosion, caustic embrittlement and carry over) and remedies - removal of oils and silica, internal conditioning. Desalination by electro-dialysis and reverse osmosis.

Unit II Oils, Fats, Soaps & Lubricants

Chemical constitution, chemical analysis of oils and fats - free acid, saponification and iodine values, definitions, determinations and significance. Soaps and detergents - cleaning action of soap. Lubricants - definition, characteristics, types and properties - viscosity, viscosity index, carbon residue, oxidation stability, flash and fire points, cloud and pour points, aniline point. Solid lubricants - graphite and molybdenum disulphide.

Unit III Chemical Analysis - An Analytical Insight


Unit IV Dye Chemistry

Witt's theory and modern theory of colors - synthesis of methyl red, methyl orange, congo red, malachite green, p-rosaniline, phenolphthalein, fluorescence, eosin dyes.

Unit V Chemicals and Auxiliaries

Preparations of bleaching powder, sodium hypochlorite, hydrogen peroxide, chlorine dioxide - estimation of available chlorine in hypochlorite - determination of strength of hydrogen peroxide.

Total: 45 Periods

Text Books


References

OBJECTIVE:
The objective of this course is to inculcate in the student the ability to analyze any problem in a simple and logical manner and to predict the physical phenomena and thus lay the foundation for engineering applications.

UNIT I  STATICS OF PARTICLES  12

UNIT II  EQUILIBRIUM OF RIGID BODIES  12

UNIT III  DISTRIBUTED FORCES  16
Centroids of lines and areas – symmetrical and unsymmetrical shapes, Determination of Centroids by Integration, Theorems of Pappus-Guldinus, Distributed Loads on Beams, Center of Gravity of a Three-Dimensional Body, Centroid of a Volume, Composite Bodies, Determination of Centroids of Volumes by Integration. Moments of Inertia of Areas and Mass - Determination of the Moment of Inertia of an Area by Integration, Polar Moment of Inertia, Radius of Gyration of an Area, Parallel-Axis Theorem, Moments of Inertia of Composite Areas, Moments of Inertia of a Mass - Moments of Inertia of Thin Plates, Determination of the Moment of Inertia of a Three-Dimensional Body by Integration.

UNIT IV  FRICTION  8

UNIT V  DYNAMICS OF PARTICLES  12

L – 45 + T – 15 TOTAL: 60 PERIODS

OUTCOMES:
- Upon completion of this course, students will be able to construct meaningful mathematical models of physical problems and solve them.

TEXT BOOK

REFERENCES
OBJECTIVES:
• To learn programming using a structured programming language.
• To provide C programming exposure.
• To introduce foundational concepts of computer programming to students of different branches of Engineering and Technology.

UNIT I INTRODUCTION
Introduction to Computers – Computer Software – Computer Networks and Internet - Need for logical thinking – Problem formulation and development of simple programs - Pseudo code - Flow Chart and Algorithms.

UNIT II C PROGRAMMING BASICS

UNIT III ARRAYS AND STRINGS

UNIT IV POINTERS
Macros - Storage classes –Basic concepts of Pointers– Pointer arithmetic - Example Problems - Basic file operations

UNIT V FUNCTIONS AND USER DEFINED DATA TYPES

OUTCOMES
At the end of the course, the student should be able to:
• Write C program for simple applications
• Formulate algorithm for simple problems
• Analyze different data types and arrays
• Perform simple search and sort.
• Use programming language to solve problems.

TEXTBOOKS:

REFERENCES:
OBJECTIVE

- To make the student acquire practical skills in the wet chemical and instrumental methods for quantitative estimation of nitrite in water, cement, oil, coal, Phenol

LIST OF EXPERIMENTS

1. Determination of Redwood / Saybolt numbers, kinematic viscosity and viscosity index of lubricating oils
2. Determination of flash point, fire point, cloud and pour point of oils
3. Determination of acid value, iodine value of oils and saponification value.
4. Determination of COD of water samples
5. Determination of total, temporary & permanent hardness of water by EDTA method.
6. Estimation of HCl using Na₂CO₃ as primary standard and determination of alkalinity in water sample.
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
11. Determination of Calorific value using Bomb calorimeter

TOTAL: 60 PERIODS

OUTCOME

- Familiarization with equipment like viscometers, flash and fire point apparatus etc
- Familiarization of methods for determining COD
- Familiarization of a few simple synthetic techniques for soap

TEXT BOOKS


OBJECTIVES

- To understand the basic programming constructs and articulate how they are used to develop a program with a desired runtime execution flow.
- To articulate where computer programs fit in the provision of computer-based solutions to real world problems.
- To learn to use user defined data structures.

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
10. Program using structures and unions.

TOTAL: 60 PERIODS
OUTCOMES
At the end of the course, the student should be able to:
- Write and compile programs using C programs.
- Write program with the concept of Structured Programming
- Identify suitable data structure for solving a problem
- Demonstrate the use of conditional statement.

LABORATORY REQUIREMENTS FOR BATCH OF 30 STUDENTS
30 Systems with C compiler

MA7357 PROBABILITY AND STATISTICS L T P C
4 0 0 4

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 12
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 12
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 12

UNIT IV DESIGN OF EXPERIMENTS 12
Completely randomized design – Randomized block design – Latin square design - $2^2$ - factorial design - Taguchi’s robust parameter design.

UNIT V STATISTICAL QUALITY CONTROL 12
Control charts for measurements ( $\bar{X}$ and R charts) – Control charts for attributes (p, c and np charts) – Tolerance limits - Acceptance sampling.

TOTAL: 60 PERIODS

OUTCOMES:
- Students will be able characterize probability models using probability mass (density) functions & cumulative distribution functions.
- The students can independently participate in the processes of analysis, planning, formulating strategies of development, decision-making, governing and management, and independent making of tactical and strategic decisions related to the statistics.

TEXT BOOKS:
REFERENCES:

EE7254 PRINCIPLES OF ELECTRICAL AND ELECTRONICS ENGINEERING L T P C
3 0 0 3

OBJECTIVES:
To impart knowledge on
• Electric circuit laws, single and three phase circuits and wiring
• Working principles of Electrical Machines
• Various electronic devices and measuring instruments

UNIT I ELECTRICAL CIRCUITS
Basic principles involved in power generation, transmission and distribution, Ohms Law, Kirchhoff’s Law, steady state solution of DC circuits, Thevinin’s Theorem, Norton’s Theorem, Superposition Theorem.

UNIT II AC CIRCUITS
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
Principles of operation and characteristics of DC machines. Transformers (single and three phase), Synchronous machines, three phase and single phase induction motors.

UNIT IV ELECTRONIC DEVICES & CIRCUITS

UNIT V MEASUREMENTS & INSTRUMENTATION
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 transformers (CT and PT)

OUTCOMES:
Ability to
• Understand electric circuits and working principles of electrical machines
• Understand the concepts of various electronic devices
• Choose appropriate instruments for electrical measurement for a specific application

REFERENCES

Annexure
AT7302 TECHNOLOGY OF FABRIC FORMATION

OBJECTIVE:
To enable the students to understand the preparation for weaving and various functions of weaving machine

UNIT I PREPARATION OF YARN FOR WEAVING
Principles of winding and winding machines; yarn clearing and process control.

UNIT II PREPARATION OF BEAM FOR WEAVING
Types of warping and machines; sizing recipe and sizing application; drawing and denting

UNIT III SHEDDING
Looms – types, basic motions; shedding mechanisms for shuttle and shuttles weaving machines

UNIT IV PICKING AND BEAT-UP
Principles of weft insertion by shuttle, projectile, jet and rapier; multi-phase weaving systems; Beat-up mechanisms

UNIT V SECONDARY AND AUXILIARY MOTIONS
Take-up and let-off motions; warp protectors; warp and weft stop motions; automations; woven fabric defects

TOTAL: 45 PERIODS

OUTCOMES
Upon completion of this course, the student shall
- Understand the concepts of preparation of yarn for weaving
- Understand different motions of loom in fabric formation

REFERENCES
OBJECTIVE:
To enable the students to understand various processes involved in conversion of fibre to yarn by ring spinning system and other modern spinning systems.

UNIT I  OPENING AND CLEANING  12
Linear density systems for textile materials; Ginning – objectives, types, working principle and ginning performance on yarn quality; opening and cleaning – objectives of blow room machines, principle and description of opening, cleaning and blending machines, contamination clearers and safety devices; chute feed system

UNIT II  CARDING AND DRAWING  12
Carding – objectives, principles of carding, working of carding machine; drawing machine– objectives, drafting system – types and applications, , principles of auto levellers

UNIT III  COMBING AND ROVING  12
Comber preparation – objectives, principles of sliver lap ribbon lap and super lap formers; comber - principle of combing, sequence of combing operation; roving machine – objectives, working principle and operation

UNIT IV  RING SPINNING AND YARN PLYING  12
Ring spinning machine – objectives, working principle and operation; condensed yarn spinning – principles, types, merits; two-folding of yarns –package preparation, working principle, resultant count calculation; fancy yarn – types, method of production and applications

UNIT V  NEW SPINNING PROCESS  12
Principles of yarn formation – rotor, friction, air vortex and air-jet spinning machines; , core, wrap, spinning system

OUTCOMES
Upon completion of this course, the student shall understand
- Process sequence for producing different types of yarns
- Principle of machines used for production of yarn

REFERENCES
OBJECTIVES:
To enable the students to understand the
- Structure and morphology of textile fibres
- Physical characteristics textile fibres

UNIT I  STRUCTURE OF FIBRES
Classification of fibres; study of morphological structures of fibers; physical properties of fibres.
order and disorder in fibre structure; molecular conformations – planar zig-zag, helical, lamellar,
and sphrulite conformations.

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

UNIT III  MOISTURE ABSORPTION CHARACTERISTICS
Theories of moisture sorption; Moisture absorption behavior of natural and man-made fibres;
influence of fibre structure, humidity and temperature on the moisture absorption; conditioning of
Heat of sorption – integral and differential, their relation; factors influencing heat of sorption -
measurement of heat of sorption

UNIT IV  TENSILE AND ELONGATION CHARACTERISTICS OF FIBRES
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 manmade fibres
- influence of fibre structure, humidity and temperature on tensile characteristics. Time effects-
Study of creep phenomena. 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. Introduction about torsional and flexural rigidity of fibers

UNIT V  OPTICAL, FRICTIONAL, AND THERMAL CHARACTERISTICS
Reflexion and Lustre-objective and subjective methods of measurement - refractive index and its
measurement - birefringence, factors influencing birefringence - Absorption and dichroism
Friction – static, limiting and kinetic friction, its measurement, comparison of fibres, directional
friction in wool – friction. Thermal transitions of fibres - thermal conductivity, thermal expansion
and contraction, Tg, melting; static electricity in textile fibres

OUTCOME:
Upon completion of this course, the student shall be able to
- Correlate the physical properties of fibre to its microstructure and its influence on other
characteristics
- Choose appropriate fibre for the required property
### AT7301  FUNDAMENTALS OF GARMENT MANUFACTURING  

#### OBJECTIVES:
To introduce briefly the fundamentals of garment manufacture to the students

#### UNIT I  
12
Introduction to Indian apparel industry; Anthropometry, Specification sheet, technical pack; Pre production planning - spreading, cutting, marker; types of samples and sample approval; garment accessories

#### UNIT II  
12
Stitch types and uses; seam types and uses; stitch and seam identification; sewing threads; sewing machinery and working aids

#### UNIT III  
6
Trims and components; fusing material, types of fusing; pressing and packing

**TOTAL: 30 PERIODS**

### OUTCOMES
Upon completion of this course, the students shall understand fundamental aspects of production of garment and various processes involved

### REFERENCES

EE7261  ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY  L T P C  0 0 4 2

OBJECTIVE:
To train the students in performing various tests on electrical drives, sensors and circuits.

LIST OF EXPERIMENTS:
1. Load test on separately excited DC shunt generator
2. Load test on DC shunt moor
3. Load test on S Transformer
4. Load test on Induction motor
5. Regulation of 3 Alternator
6. Study of CRO
7. Logic gates
8. Operational amplifiers
9. Time constant of RC circuit
10. Characteristics of LVDT
11. Calibration of Rotometer
12. RTD and Thermistor
13. Flapper Nozzle system

TOTAL : 60 PERIODS

AT7312  TEXTILE MANUFACTURING LABORATORY  L T P C  0 0 2 1

OBJECTIVES:
To enable the students to
- Get practical experience in the yarn spinning, weaving preparatory and weaving machines
- Learn material passage and identify the parts of machines of spinning and weaving machines

LIST OF EXPERIMENTS
Material passage and production calculation in
1. Ginning, scutcher
2. Carding machine
3. Comber
4. Draw frame
5. Speed frame
6. Material passage, draft, twist and production calculation in ring frame
7. Material passage and production calculation in rotor spinning machine
8. Material passage and production calculation in winding machine
9. Timing diagram of weaving machine

37
10. Shedding mechanisms - Tappet, dobbey
11. Jacquard mechanism
12. Picking mechanism and calculation of shuttle speed
13. Beat-up mechanism and loom timing of primary motion
14. Let-off and take-up mechanism
15. Auxiliary mechanisms

TOTAL: 30 PERIODS

OUTCOMES:
Upon completion of this practical course, the students shall be able to

- Understand the material passage in the machine, draw gearing diagram, identify the components of spinning and weaving machines
- Calculate draft, twist and production rate of spinning machines
- Understand the mechanism of weaving machine

AT7311  BASIC SEWING LABORATORY  L T P C  0 0 2 1

OBJECTIVES:
To enable the students to get practical experience in sewing machine

LIST OF EXPERIMENTS
1) Identification of sewing machine components and understanding their functions

2) Basics of sewing settings
   - Needle fixing and threading in
     Single needle, double needle, over-lock and feed-of the-arm machine
   - Pedal and knee lifter operations practice
   - Winding the bobbin thread – adjusting the bobbin thread tension.
   - Adjusting the stitch length, needle thread tension nut, pressure of presser foot, feed-dog, thread take-up spring and needle thread take-up lever

3) Sewing exercise on paper
   - Exercise 1 - Parallel line
   - Exercise 2 - Corners
   - Exercise 3 - Concentric squares
   - Exercise 4 - Curves
   - Exercise 5 - Concentric curves

4) Stitching exercise on fabric panels
   - Exercise 1 - Parallel line
   - Exercise 2 - Corners
   - Exercise 3 - Concentric squares
   - Exercise 4 - Curves
   - Exercise 5 - Concentric curves

TOTAL: 30 PERIODS

OUTCOMES:
Upon completion of this practical course, the student shall be able to

- Identify the machine components and understand the function of elements of sewing machine
- Understand the basic sewing operations
- Sew on fabric panels

CH7351  SOLID MECHANICS FOR TECHNOLOGISTS  L T P C  3 0 0 3

AIM
To give the students the 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.

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

UNIT V  TORSION AND COLUMNS  9

TOTAL : 45 PERIODS

OUTCOMES:

- Solve the problems related to the structural components under various loading conditions

TEXT BOOKS


REFERENCES

UNIT I  LAYING, MARKING AND CUTTING  9

UNIT II  SEAMS AND STITCHES  13
Seam types and classes; stitch types, machine elements in sewing, sewing threads- types and characteristics, stitch parameters, sewing defects

UNIT III  GARMENT COMPONENTS AND ITS STYLINGS  5
Ladies, men's and children's dress wear - collars, sleeves, cuffs, pleats, gatherings and darts, pockets, welts, yoke; purpose of darts and dart equivalents; children's dresses, innerwear and lingerie; balance and symmetry in garment construction

UNIT IV  STYLES AND OPERATION BREAKDOWN  13
Operation break down for shirts, trousers, blouses, jackets, dresses; material flow and assembly of garments, machinery and work force allocation

UNIT V  PRODUCTION PROCESSES  5
Production line set up, line balancing, production systems - full garment assembly, make through, batch production, progressive bundle, straight line assembly, unit production system, modular production system

TOTAL: 45 PERIODS

COURSE OUTCOMES
Upon completion of this course, the students shall
• Understand various process involved in garment construction
• Know operation breakdown for different styles of garments
• Know different apparel production systems

REFERENCES
OBJECTIVES:
- To introduce students the human anthropometrics from the scientific and technological viewpoint
- To equip students with comprehensive pattern making skills

UNIT I  
BASICS OF ANTHROPOMETRICS AND SIZING SYSTEM  
Anthropometry measurements, human anatomy, landmark terms, perception of body appearance, its relation to clothing, clothing sizing systems, illusions created by clothing, body ideals—Eight head theory, body proportions, height and weight distribution.

UNIT II  
BODY MEASUREMENTS AND PATTERN TERMINOLOGIES  
Important body measurements across all age groups, methods of measuring body dimensions, standard measurement chart-designation and control dimensions. Functions of pattern making tools, preparation of dress form, pattern grain line, balance line terms, notches, seam allowance, jog seam, dart points, pleats, flares, gather and true bias, truing, blending.

UNIT III  
DRAFTING  
Types of pattern making - drafting and draping methods; principles of pattern making, pattern details; basic blocks for men and women

UNIT IV  
PATTERNS FOR COLLARS AND SLEEVES  
Collar classification and terms, basic shirt collar, peter pan collar, sailor collar, mandarin collar, built-up neck lines, cowls, sleeve cap, sleeve cuffs, puff, petal, lantern and leg-of-mutton sleeves

UNIT V  
FLAT PATTERN TECHNIQUES  
Dart manipulation—single dart series-slash-spread technique, pivotal transfer technique; two dart series-slash spread and pivotal transfer technique; graduated and radiating darts; parallel, asymmetric and intersecting darts; types of added fulness and contouring principle

TOTAL: 45 PERIODS

OUTCOMES:
On completion of this course, the students shall have knowledge on
- Clothing sizing system
- Methods of body measurements
- Drafting and pattern preparation

REFERENCES

AT7402  
KNIT FABRIC PRODUCTION  
OBJECTIVES:
To make the students understand fundamentals of knitting and types of knitting processes
UNIT I  INTRODUCTION
Reasons for the growth of the knitting industry; comparison of fabric properties - woven, knitted and bonded fabrics; classification of knitting processes – weft knit & warp knit; yarn quality requirements for knitting.

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; production of various weft knitted structures using flat knitting machines; weft knitted fabric defects.

UNIT IV  WARP KNITTING
Basic principles; elements of warp knitted loop – open and closed laps; tricot and raschel warp knitting machines; warp knitted fabrics – structures and end uses; warp knitted fabric defects.

OUTCOMES:
Upon completion of this course, the student shall be able to understand the principle of knitting in different types of knitting machines and knitted fabric defects.

REFERENCES

TOTAL: 30 PERIODS

AT7403  TEXTILE CHEMICAL PROCESSING I  L T P C
3 0 0 3

OBJECTIVE:
To enable the students to learn about pre-treatments involved in the wet processing of textiles, dyeing and printing of textiles.

UNIT I
Operation sequence in chemical processing of cotton, silk, wool, rayon, polyester, polyamide, polyester and cellulosic blend materials with emphasis on the objectives of each operation.

UNIT II
Scouring; bleaching and mercerization of cotton; preparatory process for wool and silk.

UNIT III
Stages involved in dyeing process, principle of application of direct, reactive, vat, acid, disperse and natural dyes; principles of working of loose fibre, yarn and fabric processing machines.

UNIT IV
Printing methods and styles of printing; general constitution of printing paste, printing with pigments, principles of transfer and ink-jet printing, dyeing and printing faults, assessment of fastness properties of dyed and printed goods.
UNIT V
Fundamentals of colour science, assessment of colour of dyed and printed goods; basics of colour matching technique; assessment of whiteness and yellowness indices and colour difference; pass/fail decision making.

TOTAL: 45 PERIODS

OUTCOMES
Upon completion of this course, the student shall have the knowledge on

- Necessity and requirements of pre-treatments in wet processing of textiles
- Dyeing and printing of textile materials
- Fundamentals of colour science and assessment of colour of coloured goods

REFERENCES

TT7451 WOVEN FABRIC STRUCTURE

OBJECTIVES:
To enable the students to learn about different structures of woven fabric and design the structure for different applications

UNIT I
Basic weaves – plain, twill, 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 III
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

OUTCOMES:
Upon the completion of this course the student will be able to
- Understand different structures of woven fabric
- Design the structure for different end uses
- Construct the draft and peg-plan which are required to convert the design into fabric

REFERENCES

AT7411 PATTERN MAKING LABORATORY L T P C
0 0 4 2

OBJECTIVES:
To enable the students to practically carryout pattern making for men, women and children garments

LIST OF EXPERIMENTS
1. Measuring the Form – Male, female and child.
2. Formulating standard measurement chart.
3. Drafting the basic pattern set using the above measurement chart.
4. Drafting patterns for different types of sleeves
5. Drafting patterns for different types of collars
6. Single dart series slash spread technique, pivotal transfer technique
7. Double dart series slash spread technique, pivotal transfer technique

OUTCOMES:
Upon completion of this practical course, the students shall know about
- Patterns with seam and cutting allowance for men, women and children garments
- Method of solving fitting problems in patterns
- Different draping techniques

TOTAL: 60 PERIODS
OBJECTIVES:
To enable the students to analyse different fabrics for structure and constructional details

LIST OF EXPERIMENTS
1. Visualization of commercially available woven, knitted and nonwoven fabrics
2. Analysis of construction details of the following fabric structure
   i. Plain and its derivatives
   ii. Twill and its derivatives
   iii. Satin (Regular and irregular)
   iv. Sateen (Regular and irregular)
   v. Honeycomb (ordinary and Brighton)
   vi. Huck-a-back
   vii. Extra warp and extra weft figuring
   viii. Pile fabrics (warp and weft)
   ix. Backed fabrics
   x. Gauze and Leno
   xi. Double cloth
   xii. Crepe
   xiii. Tapestry
   xiv. Mock-leno
   xv. Bedford cord.
   xvi. Single jersey
   xvii. Double jersey structures
3. Analysis of blend composition in the yarn of the fabric
4. Analysis of finish on the fabric

TOTAL:60 PERIODS

OUTCOMES:
Upon completion of this practical course, the student will be able to
- Analyse the fabric and determine the constructional details
- Draw design, draft and peg plan of the structure of the fabrics

AT7552 GARMENT PRODUCTION MACHINERY

OBJECTIVE:
To acquaint students of the basic production machinery and equipments used in garment construction

UNIT I FABRIC INSPECTION, SPREADING AND CUTTING MACHINES
Fabric inspection machinery; spreading machines – manual, semi automatic and fully automatic machines; mechanism of straight knife, rotary, band knife, die, laser, plasma, water jet and ultrasonic cutting machines; notches, drills and thread markers; computer interfaced cutting machines; fusing and molding machines; safety measures

UNIT II SEWING MACHINES
Lock stitch and chain stitch sewing machine – types, driving arrangement, function of elements, stitch formation, timing, settings and feed mechanism; needles-geometry and types; selection of machine and process parameters for different applications; Button fixing and button holing machine; safety measures

UNIT III MULTI THREAD SEWING MACHINES
Overlock, flatlock, feed-off the arm, zig-zag and embroidery machines– driving arrangement, function of elements, stitch formation, timing, settings and feed mechanism; safety measures

UNIT IV FINISHING MACHINES
Pressing machineries – buck pressing, iron pressing, block or die pressing, form pressing, steamers; folding and packing machines; safety measures
OUTCOMES:
Upon completion of the course, the students would understand
- Fundamental principle and working of machines used for spreading and cutting
- Different types of basics sewing, multithread sewing, and finishing machines used for garment manufacture

TOTAL: 45 PERIODS

REFERENCES

AT7551 ADVANCED PATTERN ENGINEERING

OBJECTIVES:
To enable the students to develop better understanding on pattern construction, grading and pattern alteration techniques to provide good fit

UNIT I FOUNDATIONS FOR TOPS
Basic shirt foundation-front bodice draft, back bodice draft, sleeve draft, adding seam allowance and pattern information; kimono, raglan foundation; pattern for princess line foundation, strapless princess bodice foundation

UNIT II FOUNDATIONS FOR BOTTOM WEAR
Pant foundation - front and back, waist band; jean foundation, pant derivatives;

UNIT III PATTERNS FOR POCKET, PLACKET AND FACINGS
Pocket classification, plackets; facing patterns for cut-out necklines and armholes

UNIT IV PATTERNS FOR KNITS, ACTION WEAR AND SWIMWEAR
Knit top foundations, bodysuit foundations and variations; swimwear - maillot, bikini, little-boy, and full-figure swim foundations; pattern for bias-cut dresses;

UNIT V PATTERN ALTERATIONS AND GRADING
Pattern alteration - fit for bodice, trouser and skirt; grading process, grade rules and types of grading system

OUTCOMES:
Upon completion of the course, the students shall have knowledge on the
- Pattern making with respect to sleeves, collar and pockets
- Foundations for tops and bottom wear construction
- Pattern preparation for knits, swim and action wear
- Pattern alteration and grading

TOTAL: 45 PERIODS

REFERENCES
AT7501 TEXTILE CHEMICAL PROCESSING II

OBJECTIVE:
To enable the students to learn about chemical finishing of fabrics and dyeing of garments

UNIT I
13
Finishing - Calendering, shrink proofing, antistatic finish, softening, water and flame proofing, UV protection, antimicrobial finish, resin finishing – crease recovery, wash and wear and durable press finishes

UNIT II
5
Standard methods of assessment of all the above finishes

UNIT III
9
Selection of garment accessories for garment dyeing; preparation of garments for dyeing; garment dyeing machines; physical finishes for garments.

UNIT IV
9
Selection of dyes and auxiliaries for garment dyeing; printing machines for garments and unconventional printing techniques; washing of denim and other garments, laundering and stain removal.

UNIT V
9
Eco friendly chemical processes, banned dyes and chemicals, evaluation techniques for assessment of these agents, permissible limits for objectionable agents.

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the students will have knowledge on
• Chemical finishing treatment of textile materials
• Dyeing and printing of garments
• Eco friendly chemical processes

REFERENCES:
OBJECTIVES:
To study the nature and the facts about environment.
- To find and implement scientific, technological, economic and political solutions to environmental problems.
- To study the interrelationship between living organism and environment.
- To appreciate the importance of environment by assessing its impact on the human world; envision the surrounding environment, its functions and its value.
- To study the dynamic processes and understand the features of the earth’s interior and surface.
- To study the integrated themes and biodiversity, natural resources, pollution control and waste management.

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 10
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 7
From unsustainable to sustainable development – urban problems related to energy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of people; its problems and concerns, case studies – role of non-governmental organization- environmental ethics: Issues and possible solutions – climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies – wasteland reclamation – consumerism and waste products – environment production act – Air...

UNIT V HUMAN POPULATION AND THE ENVIRONMENT 6

TOTAL: 45 PERIODS

OUTCOMES:
Environmental Pollution or problems cannot be solved by mere laws. Public participation is an important aspect which serves the environmental Protection. One will obtain knowledge on the following after completing the course.
- Public awareness of environment at infant stage.
- Ignorance and incomplete knowledge has lead to misconceptions.
- Development and improvement in standard of living has lead to serious environmental disasters.

TEXT BOOKS:

REFERENCES:

TT7561 TEXTILE CHEMICAL PROCESSING LABORATORY L T P C 0 0 4 2

OBJECTIVE:
To train the students in pre-treatment, dyeing, printing and testing of textile materials

LIST OF EXPERIMENTS
2. Peroxide Bleaching of Cotton Yarn/Fabric.
3. Degumming of silk.
4. Identification of dyes.
5. Dyeing of Cotton using Reactive dyes
6. Dyeing of Cotton using Vat dye
7. Dyeing of polyester using disperse dyes.
8. Dyeing of polyester and cotton blend.
9. Determination of wash, light, perspiration and rubbing fastness of dyed fabrics
11. Determination of Whiteness and Yellowness index.
13. Water proof and Flame retardant finishing of cotton
15. Antimicrobial Finish Evaluation

TOTAL:60 PERIODS
OUTCOME:
Upon completing this practical course, the student would be able to
- Desize, scour, bleach, dye, print and finish the fabric with different types of chemicals and colourants
- Evaluate the fabrics for fastness and chemical process related properties

AT7511 GARMENT CONSTRUCTION LABORATORY

OBJECTIVES
To train the students on construction of different types of garments

LIST OF EXPERIMENTS
1. Formation of Stitch classes.
2. Sewing practice of seam types – superimposed seam, lapped seam, bound seam and flat seam.
3. Sewing of plackets
4. Sewing of pockets
5. Sewing of different types of sleeves
6. Sewing of different types of collars
7. Assembling of various garment components using appropriate seams
8. Practice in Button hole and button stitch machines
9. Practice in Feed-off the arm machine
10. Practice in Flat lock machine

OUTCOME:
Upon completion of this practical course, the students can
- Carry out different types of stitching, button holing and button stitching and would have hands on experience on different machines used for garment manufacture
- Understand drafting and draping

AT7651 INDUSTRIAL ENGINEERING IN APPAREL INDUSTRY

OBJECTIVES:
To enable the students to learn about
- Basics of industrial engineering
- Different tools of industrial engineering and its application in apparel industry

UNIT I
Industrial Engineering - evolution, functions, role of industrial engineer; work study- introduction, procedure

UNIT II
Methods study – introduction, approach to method study; techniques of recording; method analysis techniques; principles of motion economy; method study in garment manufacture

UNIT III
Ergonomics - importance, division; ergonomic principles - designing of workplace, working processes, handling material, tools and environment; ergonomic conditions related to garment industry

UNIT IV
Work measurement – introduction; time study – equipment and procedure; standard data; work sampling techniques; incentive wage system; work measurement applied to garment industry; calculation of standard allowance minutes (SAM)
UNIT V
Site selection for garment industry; plant layout - types of layouts suitable for garment industry, methods to construct layout; line balancing

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the students will be able to apply the following methodologies in garment industry
• Method study, work measurement
• Estimation of SAM
• Layout study and line balancing
• Ergonomics applied to garment industry

REFERENCES

TT7651 FABRIC QUALITY EVALUATION

OBJECTIVES:
To enable the students to learn about the constructional details of fabrics, evaluation of fabric properties and their importance

UNIT I CONSTRUCTION CHARACTERISTICS
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 density (GSM); warp and weft crimp measurements for spun and filament yarn fabrics, the cover factor calculations; fabric sampling techniques.

UNIT II STRENGTH CHARACTERISTICS
Tensile strength measurement – ravelled strip test and grab test, mechanical and electronic measuring systems; tear strength – importance, measuring systems; bursting strength and its measurement; ballistic impact strength; Universal tensile tester - principle and operation
UNIT III  SURFACE CHARACTERISTICS
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  LOW STRESS AND FUNCTIONAL CHARACTERISTICS
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
Fabric inspection – manual, semi-automatic and automatic inspection systems; classification of fabric defects; independent product quality certification, acceptable quality level, MIL standards and final inspection; quality assessment of garments - cutting, sewing, pressing, finishing and packaging defects.

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, students would be able to
- Evaluate the constructional parameters of fabrics
- Understand the principle of equipments used for measurement of fabric characteristics
- Analyze various reports generated during quality evaluation of fabrics
- Understand the evaluation of garment quality

REFERENCES

TT7652  FINANCIAL MANAGEMENT FOR TEXTILE AND APPAREL INDUSTRIES

OBJECTIVES:
To enable the students to understand
- Basics of financial management that are required for the textile industry
- Determination of cost of yarn, fabric and garment

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

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UNIT II
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
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

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the students shall be able to
- Determine the cost of yarn, fabrics and garments
- Construct cost sheet
- Understand the economic feasibility of capital investment, sources of capital and cost of capital
- Interpret the financial statements

REFERENCES

HS7551 EMPLOYABILITY SKILLS

COURSE DESCRIPTION
This course aims to help the students acquire the employability skills necessary for the workplace situations. It also attempts to meet the expectations of the employers by giving special attention to language skills, presentation skills, group discussion skills and soft skills. This will be achieved through expert guidance and teaching activities focusing on employability skills.

COURSE 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 reading skills, writing skills, and soft skills necessary for the
workplace situations

• To make them employable graduates

CONTENTS

UNIT I READING AND WRITING SKILLS
Reading: skimming & scanning strategies – note making skills – interpreting visual material (charts & tables) – critical reading – fast reading necessary for reading letters & files - preparing job applications - writing covering letter and résumé - applying for jobs online - email etiquette – writing official letters (placing an order, letters to consumers, etc. ) writing reports – collecting, analyzing and interpreting data

UNIT II SOFT SKILLS
Hard skills & soft skills – soft skills: self-management skills & people skills - training in soft skills - persuasive skills – sociability skills – interpersonal skills – team building skills – leadership skills – problem solving skills – adaptability - stress management – motivation techniques – life skills -

UNIT III PRESENTATION SKILLS
Preparing slides with animation related to the topic – organizing the material - Introducing oneself to the audience – introducing the topic – answering questions – individual presentation practice— presenting the visuals effectively – 5 minute presentation

UNIT IV GROUP DISCUSSION SKILLS
Participating in group discussions – understanding group dynamics - brainstorming the topic — questioning and clarifying – GD strategies (expressing opinions, accepting or refusing others opinions, turn taking) – activities to improve GD skills – viewing recorded GD - mock GD

UNIT V INTERVIEW SKILLS

LEARNING OUTCOMES

• Students will be able to make presentations and participate in group discussions with high level of self-confidence.
• Students will be able to perform well in the interviews
• They will have adequate reading and writing skills needed for workplace situations

REFERENCES:

TOTAL:45PERIODS

EXTENSIVE READING

WEB RESOURCES
1. www.humanresources.about.com
2. www.careerride.com
AT7611 FASHION DESIGN LABORATORY

OBJECTIVES:
To practically train the students in fashion drawing and fashion illustration techniques

LIST OF EXPERIMENTS:
1. Experimenting with solids-Men’s, women’s and children’s
2. Experimenting with stripes Men’s, women’s and children’s
3. Experimenting with checks and plaids Men’s, women’s and children’s

TOTAL: 30 PERIODS

OUTCOMES:
Upon completion of this practical course, the students can design men’s, women’s and children’s dresses

TT7661 FABRIC QUALITY EVALUATION LABORATORY

OBJECTIVE:
To make the students practically learn the various fabric evaluation procedures to determine the characteristics of fabric

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: 30 PERIODS

OUTCOMES:
Upon completion of the course, the students will be able to
- Measure important characteristics of fabrics and garments
- Interpret the results obtained during evaluation of fabrics

AT7702 APPAREL PRODUCTION PLANNING AND PROCESS CONTROL

OBJECTIVES:
- To enable the students to understand the production planning in garment industry
- To emphasis on the improved methods of material control in apparel production
- To acquaint student with quality concepts for implementing quality in apparel production

UNIT I
Control parameters and basic data of styles and generalised garment types, new program analysis, style-wise design-wise analysis on production parameters, product development and duplication; concepts of concurrent engineering, reverse engineering, production planning and...
time and action calendar, steps between prototypes to approved sample-production sample, product data management and understanding specification sheets and effective communication

UNIT II
Operation break down and production sequence, identification of bottle necks and critical operations, operation wise machinery allocation, usage of special attachments and tools for operation simplifications, production grid and flow chart.

UNIT III
Cutting methods cutting room controls, lay lot planning, bundle distributions, modern methods in cut piece distribution and tracking different manufacturing systems

UNIT IV
Production planning - line balancing, allocation of man power, production set up planning for a shirt factory, production set up planning for a bottoms and jacket factory, production set up planning for a fully integrated apparel manufacturing plant, conveyer system and control parameters

UNIT V
Quality control in pre production and production; packing - ratio packing, solid packing, short shipment, excess shipment, calculation of volumetric weight, carton and other packing requirements; concept of AQL

TOTAL: 45 PERIODS

OUTCOME:
Upon completion of this course, the students will understand
- Production planning in garment industry
- Process and quality control in garment industry

REFERENCES

AT7751 APPAREL MARKETING AND MERCHANDISING

OBJECTIVES:
To acquaint the students of the concepts of business, design merchandising, sourcing and export documentation

UNIT I INTRODUCTION TO APPAREL BUSINESS
Apparel business practices; business operations in Asian countries. Business practices of Indian apparel export and retail houses.
UNIT II  MARKETING FOR APPAREL AND TEXTILE PRODUCTS  13
Marketing for the 21st century, core concepts and orientation towards market place, strategies and planning, market research and forecast, customers, consumer markets and business markets, market segments and brand building, brand positioning and competition

UNIT III  DESIGN MERCHANDISING  9
Concepts of merchandising, apparel product lines, dimensions of product change, determination and development of product line and product range. Creative design of garments and accessories, new product development and seasons of sale, costing, coordination and communication with the production house and export house

UNIT IV  SOURCING  9
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  9

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the student shall be able to
- Apply the concept of marketing and merchandising in the apparel industry in India
- Understand the procedure involved in the export of apparel

REFERENCES

AT7703  RETAIL MANAGEMENT AND VISUAL MERCHANDISING  L T P C
3 0 0 3

OBJECTIVES:
- To introduce the students, the fashion business segments, retail management concepts
- To acquaint the students with fashion communication tools

UNIT I
Retailing, current global and Indian retail scenario in garment and fashion, key drivers of Indian apparel retail business, growth of organised apparel retail in India; understanding the Indian retail economics, foreign direct investment in Indian apparel retail.

UNIT II
Operational excellence, customer service strategies, pricing strategies, inventory levels and merchandise availability as a strategy, case studies on Indian and International retail stores, retail business formats, retail management information system

UNIT III
Objectives of store planning, location, design, retail image mix, layout plan for retail stores. Buying, mark-up and mark-down in merchandise management, private labels; apparel franchising, types, Key success factors
UNIT IV
Visual merchandising as a communication tool, presentations in visual merchandising, visual merchandising and enhanced customer buying decision, interiors with respect to brand, sensory elements, signs and graphics, focal point for season and type of sale; case studies on visual merchandising

UNIT V
An introduction to fashion e-commerce, apparel and fashion e-business, s-commerce vs. e-business, economic forces – advantages – myths – e-business models, design, develop and management of e-business, web and social networking, mobile commerce - business applications, classifications, and models, payments, security and legal requirements

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the student shall know
- The concept of retail management
- The concept of visual merchandising
e-commerce, s-commerce

REFERENCES

AT7701  APPAREL COSTING

OBJECTIVES:
To enable the students to learn about preparation of cost sheet, costing of garments

UNIT I
Cost accounting, elements of cost, classification of cost elements – examples from apparel industry, methods of costing; cost profit volume analysis, standard costing, analysis of variance; breakeven analysis

UNIT II
Costing of fabrics; costing of apparel – accounting of prime costs and overhead costs, allocation of overheads; tax structure; cost sheet preparation

UNIT III
Foreign exchange rates; foreign exchange management – risks, strategies to reduce risk

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

TOTAL: 30 PERIODS

OUTCOMES:
Upon completion of this course, the student shall be able to
- Calculate the cost garment
- Understand the concept of preparation of cost sheet, budget and breakeven analysis

REFERENCES
AT7711 COMPUTER AIDED GARMENT DESIGN LABORATORY

OBJECTIVES:
To train the students in CAD used for pattern making of garments and marker planning

LIST OF EXPERIMENTS
Using CAD software to develop
1. Basic Blocks for Men’s and Women (top and bottom)
2. Pattern for Men’s Formal shirt
3. Pattern for Men’s formal trouser (pleats and Flange)
4. Pattern for Women’s Tops (application of Dart manipulation principle)
5. Pattern for Women’s Bottoms (skirts, pants – Added fullness techniques Gatherings and pleats)
6. Patterns for children’s dresses (principles of contouring applied)
7. Patterns for Dungaree and work wear
8. Patterns for Close fitting body shapes
9. Graded patterns
10. Marker and optimise Using digitizer, carryout
11. Reverse pattern Engineering

TOTAL: 60 PERIODS

OUTCOME:
Upon completion of the course, the student will have practical experience on pattern making of different wears, maker planning and optimization

AT7001 APPAREL ACCESSORIES AND EMBELLISHMENTS

OBJECTIVES:
To enable the students to understand different types of apparel accessories used in the garment manufacture and embroidery of garments

UNIT I
Garment components and trims – 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; Indian and tribal embroideries - Kutch, Kasuti; Kantha, Kasida, Kathiawar, Phulkari, Sind; Chickankari; Zardosi embroidery; World embroideries

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

UNIT V
Batik, Iket, Kalamkari, tie and dye, patch work, appliqué work, bead work

OUTCOMES:
Upon completion of this course, the students shall understand
- Different types of accessories used for garment manufacture
- Embroideries
- Fashion accessories
- Different types of printing

REFERENCES

AT7071 PRODUCTION AND APPLICATION OF SEWING THREADS

OBJECTIVES:
To enable the students to understand the requirements and production of sewing threads for different applications

UNIT I
Sewing threads – property requirements for different applications; ticket numbering; characterization of sewing threads; sewability of the thread, seam efficiency index

UNIT II
Types of sewing thread – spun threads, core spun threads, filament threads; production, properties and applications; fancy yarns – types and production; metallic yarns

UNIT III
Characteristics and application of high performance sewing threads - aramid threads, ceramic threads, polypropylene threads, polyethylene threads, polytetrafluoroethylene threads, fibreglass threads, other sewing threads – tencel, acrylic, linen, elastic, soluble; embroidery threads

UNIT IV
Sewing defects related to sewing threads – Assessment and control

OUTCOMES:
Upon completion of the course, the students will be able to understand the
- Production of sewing thread
- Characterization of sewing thread and
- Selection of sewing thread for different end uses.
REFERENCES

AT7072 PROTECTIVE TEXTILES

OBJECTIVES:
To enable the students understand the selection of fibre, yarn, fabric and design of garments for different protective applications

UNIT I FIBRES, YARNS AND FABRICS FOR PROTECTIVE GARMENTS
Characteristic requirements of fibre, 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
Mechanism, Chemistry, Materials and methods - Flame retardant, Liquid repellent, Antistatic, Antibacterial, UV protection and mite protection finishes

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

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

UNIT V EVALUATION OF PROTECTIVE TEXTILES
Standards and test method for protective fabric performance - flame retardant finishes, liquid repellent finishes, antistatic, liquid repellent, antibacterial, UV protection, mite protection; 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

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the students shall
- Select fibres, yarns and fabrics for different protective applications
- Construct protective garments
- Evaluate protective textiles

REFERENCES

TT7073 OPERATIONS RESEARCH FOR TEXTILE INDUSTRY L T P C

OBJECTIVES:
To enable the students to learn about
- Various operations research (OR) methods that can be applied in the textile industry
- Expressing of problems arising in the textile industry in appropriate Operations Research formats
- Methods of solving such Operations Research problems

UNIT I
Introduction – History of Operations Research, Scope of Operation Research, applications and limitations; The linear programming problem – construction, solution by graphical method, the Simplex method and its extension by the Big M method; Sensitivity analysis; Application of the LP technique in the field of Textile technology.

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

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

UNIT IV
Decisions theory - decisions under assumed certainty, decision under risk, decision under uncertainty, illustrations from textile industry; simulation-theory, models, queuing system; 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 levelling

TOTAL: 45 PERIODS
OUTCOMES:
Upon completion of the course, the students will be able to
- Design Operations Research problems from the cases arising in the Textile Industry,
- Solve the above Operations Research problems by providing optimized solutions for them

REFERENCES

TT7076 TOTAL QUALITY MANAGEMENT FOR TEXTILE INDUSTRY

OBJECTIVES:
- To enable the students to understand about total quality management, different TQM tools and techniques and Quality standards
- To train the students to apply TQM tools in textile industry

UNIT I INTRODUCTION

UNIT II TQM PRINCIPLES

UNIT III TQM TOOLS & TECHNIQUES I
Concepts, improvement needs – Performance measures – BPR; application of TQM tools in textile industry

UNIT IV  LEAN MANUFACTURING, QUALITY SYSTEMS  14

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the students will be able to
- Understand the principle of TQM, different TQM tools and techniques
- Develop innovative tools to implement TQM in the textile industry
- Understand lean manufacturing system applied to textile industry

REFERENCES

TT7071  CLOTHING COMFORT  L T P C
3 0 0 3

OBJECTIVES:
To enable the students to learn about the
- Important characteristics of the fabric responsible for its comfort properties and
- Different phenomena which take place in the fabric related to the comfort properties of the fabric

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

UNIT II
Psychological comfort; neuro-physiological comfort-basis of sensory perceptions; measurement techniques - mechanical stimuli and thermal stimuli

UNIT III
Thermo physiological comfort – thermoregulatory mechanisms of the human body, role of clothing on thermal regulations

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

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

OUTCOMES:
Upon completion of this course, the student shall be able to
- Understand different phenomena such as perception of comfort, fabric mechanical properties and, heat and moisture interaction and
- Correlate the property of the fabric with comfort to the wearer

REFERENCES

AT7002 BRAND MANAGEMENT L T P C 3 0 0 3

OBJECTIVE:
To introduce students the concept of brand, brand building, branding strategies and legal issues in brand management

UNIT I
Product – definition, types; product line, product mix; new product development; estimating market and sales potential, sales forecasting

UNIT II
Brand – definition, evolution, importance; product vs. brand; terminologies used in branding; branding –creation, challenges, understanding consumer, competition, components; brand identity - brand naming, logos, characters, slogans, tools to maintain identity, illustrations from apparel industry

UNIT III
Brand Building: brand insistence model; advertising – definition, objectives, modes, economic and ethics; non-traditional marketing approach

UNIT IV
Branding strategies; brand extension, brand revitalization, brand repositioning, brand recall, brand elimination, brand imitation

UNIT V
Brand equity measurement systems; legal issues in brand management; global branding
OUTCOME:
On completion of this course, the students would have the knowledge on consumer behavior, brand identity and brand equity management

REFERENCES

AT7004 HOME TEXTILES

OBJECTIVES
To enable the students to learn about the
- Recent developments in home furnishing, floor covering and other home textile products
- Various kinds of materials used as home textiles

UNIT I INTRODUCTION
Home textiles market scenario, Consumer expectation from home textiles, Fibers and fabrics used.

UNIT II HOME FURNISHING

UNIT III FLOOR COVERING AND DRAPE
Recent Developments in manufacturing of floor coverings - Hard Floor Coverings, Resilient Floor Coverings; Soft Floor Coverings- laying procedure, maintenance and care, Carpets and Rugs- types; Cushion and Pads; factors affecting the selection of floor covering; Advances in Home decoration -Draperies – choice of fabrics – curtains – finishing of Draperies- tucks and pleats; Types of drapery rods, Hooks, Tape Rings and Pins

UNIT IV FINISHES USED IN HOME TEXTILES
Introduction, thermal draperies, protection against unpleasant odour, antimicrobial finish, moisture management finish, flame retardant finish, towel finishing, Sensory perception technology; insect and mite repellent finish, antistatic finish; temperature regulated beddings

UNIT V EVALUATION OF HOME TEXTILES
Test methods - towels, rugs; other test methods for home textiles, flammability standards for curtains, test methods for pot holders and woven mittens; labelling of home textiles

OUTCOMES:
Upon completion of this course, the student shall be able to understand
- Different types of materials used as home textiles
- Production and evaluation of home textile products

REFERENCES


AT7005 INTIMATE APPARELS

OBJECTIVES:
To acquaint students on the design, material, accessories and sewing aspects of intimate garments

UNIT I
Intimate apparels – classification, materials-fibre, fabric and accessories; physical and physiological requirements of intimate apparels

UNIT II
Design analysis, measurements, pattern drafting of men’s intimate apparel – Long johns, tank top, boy shorts, knickers, bikini underwear, thong, boxer briefs, boxer shorts and jock strap.

UNIT III
Design analysis, measurements, pattern drafting of women’s intimate apparel – petticoats, panties, camisoles, tube top, shape wear, bikini and brassier.

UNIT IV
Intimate apparel accessories - Bra wire, hook and eye tape, ring and slider, buckle, plastic bone, elastics and sewing threads

UNIT V
Sewing of intimate apparels - seams, stitches, machines; lamination; moulding and welding technique

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the students will have the skills essential to design and develop intimate apparels

REFERENCES


TT7012 QUALITY EVALUATION OF FIBRES AND YARNS

OBJECTIVES:
To make the students understand the principle and method of working of equipments used for testing of fibres and yarns

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UNIT I INTRODUCTION
Definition of quality; importance of quality assessment; method of developing quality and productivity norms; 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; tensile strength testing modes – CRT, CRE, CRL and ARL; fibre strength, importance, relation to yarn strength; measurement techniques

UNIT III FIBRE FINENESS, MATURITY AND TRASH ANALYSIS
Fibre fineness – definition, comparison of various fibres, its importance in yarn manufacture, measurement techniques; cotton fibre maturity, estimation by microscopic method, maturity ratio and index, estimation by other methods – optical, air flow differential dyeing, its importance in spinning; fibre trash – influence on quality, measurement, principle and estimation microdust for rotor spinning; high volume instrument for total fibre quality measurement

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 directions, 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
Yarn mass evenness parameters, measurement; Yarn fault classification; Yarn Appearance; yarn abrasion resistance – importance and measuring technique; yarn hairiness – importance and assessment techniques; yarn friction– static and dynamic friction, methods of measurement

OUTCOMES:
Upon completion of this course, the student shall 99be able to
- Understand the principle of equipments used for testing of fibres and yarns
- Apply knowledge gained through this course, while operating the equipments
- Analyze and interpret the results obtained from quality evaluating systems of fibre and yarns

REFERENCES
OBJECTIVES:
To enable the students understand the concept and construction of smart fabrics, intelligent textiles and interactive garments

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 fibre substrates as multifunctional and multi-use intelligent material; mechanical properties of fibre Bragg gratings, optical responses of FBG (Fibre Bragg grating) sensors under deformation ; smart textile composites integrated with optic sensors

UNIT II
Adaptive and responsive textile structures, bio-processing 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, hospital and patient care; smart garments in sports and fitness activities; smart garments for children; smart home textiles

OUTCOMES:
Upon completion of this course, the students shall have the knowledge on
- Construction of smart textiles
- Wearable electronics and smart interactive garments

REFERENCES

OBJECTIVES
• To emphasise into awareness on Engineering Ethics and Human Values.
• To understand social responsibility of an engineer.
• To appreciate ethical dilemma while discharging duties in professional life.

UNIT I  HUMAN VALUES

UNIT II  ENGINEERING ETHICS
Senses of ‘Engineering Ethics’ - variety of moral issued - types of inquiry - moral dilemma - moral autonomy - Kohlberg’s theory - Gilligan’s theory - consensus and controversy – Models of Professional Roles - theories about right action - Self-interest –Professional Ideals and Virtues -
uses of ethical theories. Valuing Time – Co-operation – Commitment –

UNIT III ENGINEERING AS SOCIAL EXPERIMENTATION 9
Engineering as experimentation - engineers as responsible experimenters - codes of ethics –
Importance of Industrial Standards - a balanced outlook on law – anticorruption- occupational
crime - the challenger case study.

UNIT IV ENGINEER’S RIGHTS AND RESPONSIBILITIESON 12
Collegiality and loyalty – Respect for authority – Collective Bargaining – Confidentiality - Conflict of
and risk - risk benefit analysis and reducing risk - the Three Mile Island, Bhopal Gas plant and
chernobyl as case studies.

UNIT V GLOBAL ISSUES 12
Multinational corporations - Environmental ethics - computer ethics - weapons development -
engineers as managers-consulting engineers-engineers as expert witnesses and advisors -moral
leadership-Sample code of conduct.

TOTAL : 45 PERIODS

OUTCOMES
 • Students will have the ability to perform with professionalism, understand their rights, legal,
ethical issues and their responsibilities as it pertains to engineering profession with engaging
in life-long learning with knowledge of contemporary issues.

TEXT BOOKS
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, “Engineering Ethics –
Concepts and Cases”, Wadsworth Thompson Leatning, United States, 2000 (Indian
New Delhi, 2004.

REFERENCES
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, “Engineering Ethics –
Concepts and Cases”, Wadsworth Thompson Leating, United States, 2000
4. Edmund G Seebauer and Robert L Barry, “Fundamentals of Ethics for Scientists and
Engineers”, Oxford Press, 2000

TT7072 COLOUR SCIENCE  L T P C
3 0 0 3

OBJECTIVES:
To enable the students to understand the theory of colour and measurement of colour

UNIT I LIGHT-MATTER INTERACTION 9
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 9
Colour sensation – physiological and psychological mechanism of colour vision; colour vision
theories; defects in colour vision; colour vision tests; additive and subtractive colour mixing, and
confusion in colour perception
UNIT III  COLOUR ORDER SYSTEMS  9
Description of colour, various colour 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  9
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; CIE model for computer colour
matching and the calculation of colour recipes; non CIE models for colour matching, limitations of
computer colour matching

UNIT V  METAMERISM AND COLOUR DIFFERENCE ASSESSMENT  9
Metamerism – types and its assessment, metamerism in textile materials; colour differences –
visual assessment, standard conditions, methods and problems, assessment of colour difference,
non-linearity of subjective perception of colour, need for specific colour difference systems, setting
up of objective pass/fail standards.

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the students shall be able to
• Understand the theory of colour
• Numerical colour matching

REFERENCES
   9788185401003.
   13: 9780669033359
   9780126976908.

TT7011  HUMAN RESOURCE MANAGEMENT  L T P C
3 0 0 3

OBJECTIVES:
To enable the students understand various aspects of human resources management and
different acts related to personnel

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.

OUTCOMES:
Upon completion of this course, the students shall be able to understand various human resource management activities in the industry and labour acts

REFERENCES

AT7007 PRODUCTION AND OPERATIONS MANAGEMENT

OBJECTIVES:
To impart knowledge on production planning, types of layouts, production concepts and materials management

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

OUTCOMES:
Upon completion of this course, the students shall understand
- Procedure for capacity planning, selection of layouts
- Concept of material management
- Different production concepts

REFERENCES

TT074 SUPPLY CHAIN MANAGEMENT FOR TEXTILE INDUSTRY

OBJECTIVES:
- To provide an insight on the fundamentals of supply chain networks, tools and techniques.
- To train the students to new and recent developments in supply chains, e-business and information technology

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 9
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 9
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

OUTCOMES:
Upon completion of this course, the student shall have the

- Knowledge of the framework and scope of supply chain networks and functions
- Capacity to develop clear, concise and organized approach to operations management

REFERENCES

TT7075 TEXTILE AND APPAREL EXIM MANAGEMENT L T P C 3 0 0 3

OBJECTIVES:
To give the students an exposure on international market for textile products, regulations with respect to export and import of textiles

UNIT I 5
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 5
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 9
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 13
Marketing – strategies, global brand building; logistics & SCM; role of export finances & EXIM banking, ECGC, Indian council of arbitration, FEMA; impact of foreign trade on Indian economy

UNIT V 13
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
OUTCOMES:
Upon completion of this course, the student shall have the knowledge on
- International market for textile products
- Global marketing strategies and
- EXIM policy and procedures

REFERENCES

TT7551 TECHNOLOGY OF BONDED FABRICS L T P C
3 0 0 3

OBJECTIVES:
To enable the students to learn about the
- Fundamentals of bonded fabrics
- Different method of web formation and bonding

UNIT I FUNDAMENTALS OF BONDED FABRICS
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
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
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
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  
Dry and Wet finishing; characterisation, structure - property relationship in bonded fabrics; End uses of bonded fabrics; safety measures to be taken at the nonwoven industry; process control in the manufacture of bonded fabrics.  

TOTAL: 45 PERIODS  

OUTCOMES:  
Upon completion of the course the student will be able to  
- Explain different types of nonwovens and their method of production  
- Explain different type of finishes applied on the nonwovens and their end uses  
- Choose appropriate web preparation and bonding techniques for getting desired properties in fabric.  

REFERENCES  

GE7071  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  
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)  
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
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
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
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.

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, Scenarious in the Indian context,
• Disaster damage assessment and management.

TEXTBOOKS:

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

GE7074 HUMAN RIGHTS L T P C 3 0 0 3
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:

AT7006 KNIT WEAR DEVELOPMENT

OBJECTIVES:
To enable the students to learn about design and production of different garments

UNIT I INTRODUCTION
Introduction to knitted materials types and features; grain, support and shape trims, linings and interlinings; requirements for sewing knitted fabrics; compression garments

UNIT II CHILDRENS WEAR
Construction of Children’s wear - stitches, seams, sewing and special machine selection and assembly operations; Rompers, Creeper, Jumpsuit, legging and skirts

UNIT III WOMENS WEAR
Women’s wear construction- stitches, seams, sewing and special machine selection and assembly operations – Tunic, Tank Tops, Sports top’s, Capri, Legging

UNIT IV MENS WEAR
Construction and assembly of men's wear - stitches, seams, sewing and special machine selection and assembly operations: T-Shirts, Polo Shirts, Raglon, Kimono Tee’s, Cap’s, Active wear, Sweat shirts, Hooded and non-hooded jackets

UNIT V INTIMATE APPARELS
Construction of Intimate apparels of men’s and women’s- assembly of men's wear - stitches, seams, sewing and special machine selection and assembly operations; Vests, Briefs, women’s Hipster, panties, bikini, thong, brassier and trunks

TOTAL : 45 PERIODS

OUTCOMES:
Upon completion of this course, the students shall be able to select the fabric and design the garment for children, women and men.

REFERENCES
AT7003 DENIM MANUFACTURING

OBJECTIVES:
To enable the students to learn about
• Requirement of fibre, yarn
• Production of fabric, dyeing and finishing
• Stitching for denim garments

UNIT I
An overview on denim and jeans; fiber qualities for denim yarn production; yarns for denim production and their characteristics

UNIT II
Indigo dye and its reduction; dyeing technology of denim yarns; non-indigo dyes for denims; weaving and finishing of denim fabrics.

UNIT III
Denim garment manufacture - types of garments and production sequence, seams and stitches, sewing threads and needles, sewing machines, fastenings, trims, pressing and Inspection.

UNIT IV
Dry and wet finishes to produce effects and colours on denim garments; novel denims

UNIT V
Dyeing of denim garments; digital printing of denim garments; comfort aspects of denim

OUTCOMES:
Upon completion of this course, the students shall know about
• Fibres and yarns used for production of denim garments
• Weaving and chemical processing of denim fabrics
• Stitching and finishing of denim garments

REFERENCES:
OBJECTIVES:

- To understand the global trends and development methodologies of various types of products and services
- To conceptualize, prototype and develop product management plan for a new product based on the type of the new product and development methodology integrating the hardware, software, controls, electronics and mechanical systems
- To understand requirement engineering and know how to collect, analyze and arrive at requirements for new product development and convert them into design specification
- To understand system modeling for system, sub-system and their interfaces and arrive at the optimum system specification and characteristics
- To develop documentation, test specifications and coordinate with various teams to validate and sustain up to the EoL (End of Life) support activities for engineering customer

UNIT I  FUNDAMENTALS OF PRODUCT DEVELOPMENT


UNIT II  REQUIREMENTS AND SYSTEM DESIGN


UNIT III  DESIGN AND TESTING


UNIT IV  SUSTENANCE ENGINEERING AND END-OF-LIFE (EOL) SUPPORT


UNIT V  BUSINESS DYNAMICS – ENGINEERING SERVICES INDUSTRY


TOTAL: 45 PERIODS
OUTCOMES:
Upon completion of the course, the students will be able to:
- Define, formulate and analyze a problem
- Solve specific problems independently or as part of a team
- Gain knowledge of the Innovation & Product Development process in the Business Context
- Work independently as well as in teams
- Manage a project from start to finish

TEXTBOOKS:
1. Book specially prepared by NASSCOM as per the MoU.

REFERENCES:

AT7008 ERP FOR APPAREL INDUSTRY

UNIT I
9+36
Enterprise Resource Planning – principle, frame work, scope; application of ERP in garment industry - business concepts, costing, order booking, MRP, purchase, production planning, production orders, inventory control, packing, shipping, scheduling, sample preparation and approval, business reports

UNIT II
3+12
ERP in apparel production – time study, cutting, production tracking, cut panel process, garment quality control, order completion, machine repairs and maintenance, reports

UNIT III
3+12
ERP in retail management – style template, finished goods barcoding, stock taking, stock inward, retail order booking, stock allocation, scan and pack, dispatch, invoice, point of sale, reports

Total number of periods (Theory + Lab):15+60

TEXT BOOKS:

REFERENCES: