PROGRAMME OBJECTIVES:

- Prepare the students to demonstrate technical competence in their profession by applying knowledge of basic and contemporary science, engineering and experimentation skills for identifying manufacturing problems and providing practical and innovative solutions.
- Prepare the students to understand the professional and ethical responsibilities in the local and global context and hence utilize their knowledge and skills for the benefit of the society.
- Enable the students to work successfully in a manufacturing environment and function well as a team member and also exhibit continuous improvement in their understanding of their technical specialization through self learning and the skill to apply it to further research and development.
- Enable the students to have sound education in selected subjects essential to develop their ability to initiate and conduct independent investigations.
- Impart fundamental knowledge in the field of textile and Fashion technology
- Provide a broad abstract and academic viewpoint of apparel manufacturing that will serve as a basis for future apparel professionals
- Enable the students to bridge the gap between graduate studies and practical work operations for the design and subsequent profitable operation of apparel industry

PROGRAMME OUTCOMES:

The students will be able to

- Apply knowledge of mathematics, science and engineering in Apparel design and production processes
- Design and conduct experiments, as well as to analyze and interpret data
- Design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- Function on multidisciplinary teams
- Identify, formulate, and solve engineering problems related to apparel production processes
- Understand the professional and ethical responsibility
- Prepare technical documents and present effectively
- Use the techniques, skills, and modern engineering tools necessary for practicing in the apparel design manufacturing industry.
- Build high moral character
- Practise better methods in apparel production and planning to take informed business decisions in the apparel industry
# ANNA UNIVERSITY, CHENNAI
## AFFILIATED INSTITUTIONS
### R - 2013
#### B. TECH. FASHION TECHNOLOGY
##### I – VIII SEMESTERS CURRICULUM AND SYLLABUS

## SEMESTER - I

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**B.TECH. FASHION TECHNOLOGY**

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<td>Professional Ethics in Engineering</td>
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<td>FT6010</td>
<td>Brand Management</td>
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<td>FT6011</td>
<td>Apparel Entrepreneurship</td>
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<td>Disaster Management</td>
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**OBJECTIVES:**
- To enable learners of Engineering and Technology develop their basic communication skills in English.
- To emphasize specially the development of speaking skills amongst learners of Engineering and Technology.
- To ensure that learners use the electronic media such as internet and supplement the learning materials used in the classroom.
- To inculcate the habit of reading and writing leading to effective and efficient communication.

**UNIT I**

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

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

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

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

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

TOTAL (L:45+T:15): 60 PERIODS

OUTCOMES:
Learners should be able to
- speak clearly, confidently, comprehensibly, and communicate with one or many listeners using appropriate communicative strategies.
- write cohesively and coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topic.
- read different genres of texts adopting various reading strategies.
- listen/view and comprehend different spoken discourses/excerpts in different accents.

TEXTBOOKS:

REFERENCES:

EXTENSIVE Reading (Not for Examination)

WEBSITES:

TEACHING METHODS:
- Lectures
- Activities conducted individually, in pairs and in groups like self introduction, peer introduction, group poster making, grammar and vocabulary games, etc.
- Discussions
- Role play activities
- Short presentations
- Listening and viewing activities with follow up activities like discussion, filling up worksheets, writing exercises (using language lab wherever necessary/possible) etc.

EVALUATION PATTERN:
Internal assessment: 20%
3 tests of which two are pen and paper tests and the other is a combination of different modes of assessment like
- Project
- Assignment
- Reviews
- Creative writing
- Poster making, etc.

All the four skills are to be tested with equal weightage given to each.
✓ Speaking assessment: Individual speaking activities, Pair work activities like role play, Interview, Group discussions
✓ Reading assessment: Reading passages with comprehension questions graded from simple to complex, from direct to inferential
✓ Writing assessment: Writing paragraphs, essays etc. Writing should include grammar and vocabulary.
✓ Listening/Viewing assessment: Lectures, dialogues, film clippings with questions on verbal as well as audio/visual content.

End Semester Examination: 80%

MA6151 MATHEMATICS – I

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

UNIT I MATRICES

UNIT II SEQUENCES AND SERIES

UNIT III APPLICATIONS OF DIFFERENTIAL CALCULUS
Curvature in Cartesian co-ordinates – Centre and radius of curvature – Circle of curvature – Evolutes – Envelopes - Evolute as envelope of normals.

UNIT IV DIFFERENTIAL CALCULUS OF SEVERAL VARIABLES

UNIT V MULTIPLE INTEGRALS

TOTAL (L:45+T:15): 60 PERIODS

OUTCOME:
- This course equips students to have basic knowledge and understanding in one fields of materials, integral and differential calculus.
TEXT BOOKS:

REFERENCES:

PH6151 ENGINEERING PHYSICS – I

L T P C
3 0 0 3

OBJECTIVES:
• To enhance the fundamental knowledge in Physics and its applications relevant to various streams of Engineering and Technology.

UNIT I CRYSTAL PHYSICS
Lattice – Unit cell – Bravais lattice – Lattice planes – Miller indices – d spacing in cubic lattice – Calculation of number of atoms per unit cell – Atomic radius – Coordination number – Packing factor for SC, BCC, FCC and HCP structures – Diamond and graphite structures (qualitative treatment) - Crystal growth techniques –solution, melt (Bridgman and Czochralski) and vapour growth techniques (qualitative)

UNIT II PROPERTIES OF MATTER AND THERMAL PHYSICS
Elasticity- Hooke’s law - Relationship between three modulii of elasticity (qualitative) – stress - strain diagram – Poisson’s ratio –Factors affecting elasticity –Bending moment – Depression of a cantilever –Young’s modulus by uniform bending- I-shaped girders

UNIT III QUANTUM PHYSICS

UNIT IV ACOUSTICS AND ULTRASONICS
Production of ultrasonics by magnetostriction and piezoelectric methods - acoustic grating -Non Destructive Testing – pulse echo system through transmission and reflection modes - A,B and C – scan displays, Medical applications - Sonogram
UNIT V  PHOTONICS AND FIBRE OPTICS  

OUTCOME:

- The students will have knowledge on the basics of physics related to properties of matter, optics, acoustics etc., and they will apply these fundamental principles to solve practical problems related to materials used for engineering applications.

TEXT BOOKS:
1. Arumugam M. Engineering Physics. Anuradha publishers, 2010

REFERENCES:
1. Searls and Zemansky. University Physics, 2009
5. Rajagopal K. Engineering Physics. PHI, New Delhi, 2011

UNIT  I  POLYMER CHEMISTRY  
Introduction: Classification of polymers – Natural and synthetic; Thermoplastic and Thermosetting. Functionality – Degree of polymerization. Types and mechanism of polymerization: Addition (Free Radical, cationic and anionic); 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. Preparation, properties and uses of Nylon 6,6, and Epoxy resin.

UNIT II  CHEMICAL THERMODYNAMICS  
Terminology of thermodynamics - Second law: Entropy - entropy change for an ideal gas, reversible and irreversible processes; entropy of phase transitions; Clausius inequality. Free energy and work function: Helmholtz and Gibbs free energy functions (problems); Criteria of spontaneity; Gibbs-Helmholtz equation (problems); Clausius-Clapeyron equation; Maxwell relations – Van’t Hoff isotherm and isochores (problems).

UNIT III  PHOTOCHEMISTRY AND SPECTROSCOPY  
TOTAL: 45 PERIODS

OUTCOME:

- The students will have knowledge on the basics of physics related to properties of matter, optics, acoustics etc., and they will apply these fundamental principles to solve practical problems related to materials used for engineering applications.

TEXT BOOKS:
1. Arumugam M. Engineering Physics. Anuradha publishers, 2010

REFERENCES:
1. Searls and Zemansky. University Physics, 2009
5. Rajagopal K. Engineering Physics. PHI, New Delhi, 2011

UNIT IV PHASE RULE AND ALLOYS

UNIT V NANO CHEMISTRY
Basics - distinction between molecules, nanoparticles and bulk materials; size-dependent properties. Nanoparticles: nano cluster, nano rod, nanotube(CNT) and nanowire. Synthesis: precipitation, thermolysis, hydrothermal, solvothermal, electrode position, chemical vapour deposition, laser ablation; Properties and applications

OUTCOME:
- The knowledge gained on polymer chemistry, thermodynamics. spectroscopy, phase rule and nano materials will provide a strong platform to understand the concepts on these subjects for further learning.

TEXT BOOKS:

REFERENCES:
UNIT II C PROGRAMMING BASICS

UNIT III ARRAYS AND STRINGS

UNIT IV FUNCTIONS AND POINTERS

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

OUTCOMES:
At the end of the course, the student should be able to:

• Design C Programs for problems.
• Write and execute C programs for simple applications.

TEXTBOOKS:

REFERENCES:

GE6152 ENGINEERING GRAPHICS

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

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

UNIT I PLANE CURVES AND FREE HAND SKETCHING
Basic Geometrical constructions, Curves used in engineering practices: Conics – Construction of
ellipse, parabola and hyperbola by eccentricity method — Construction of cycloid — construction of
involute of square and circle — Drawing of tangents and normal to the above curves, Scales:
Construction of Diagonal and Vernier scales.
Visualization concepts and Free Hand sketching: Visualization principles —Representation of
Three Dimensional objects — Layout of views- Free hand sketching of multiple views from pictorial
views of objects

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

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

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

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

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

TOTAL: 75 PERIODS

OUTCOMES:
On Completion of the course the student will be able to
• perform free hand sketching of basic geometrical constructions and multiple views of
  objects.
• do orthographic projection of lines and plane surfaces.
• draw projections and solids and development of surfaces.
• prepare isometric and perspective sections of simple solids.
• demonstrate computer aided drafting.

TEXT BOOK:

REFERENCES:
1. Gopalakrishna K.R., “Engineering Drawing” (Vol. I&II combined), Subhas Stores,
   introduction to Interactive Computer Graphics for Design and Production, Eastern

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.

GE6161 COMPUTER PRACTICES LABORATORY

OBJECTIVES:
The student should be made to:

- Be familiar with the use of Office software.
- Be exposed to presentation and visualization tools.
- Be exposed to problem solving techniques and flow charts.
- Be familiar with programming in C.
- Learn to use Arrays, strings, functions, structures and unions.

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 – Includes Parameter Passing
9. Program using Recursive Function and conversion from given program to flow chart.
10. Program using structures and unions.

TOTAL : 45 PERIODS

OUTCOMES:
At the end of the course, the student should be able to:

- Apply good programming design methods for program development.
- Design and implement C programs for simple applications.
- Develop recursive programs.

LIST OF EQUIPMENTS FOR A BATCH OF 30 STUDENTS:
Standalone desktops with C compiler 30 Nos.
(or)
Server with C compiler supporting 30 terminals or more.
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 & MECHANICAL)

I CIVIL ENGINEERING PRACTICE

Buildings:
- Study of plumbing and carpentry components of residential and industrial buildings. Safety aspects.

Plumbing Works:
(a) Study of pipeline joints, its location and functions: valves, taps, couplings, unions, reducers, elbows in household fittings.
(b) Study of pipe connections requirements for pumps and turbines.
(c) Preparation of plumbing line sketches for water supply and sewage works.
(d) Hands-on-exercise:
   - Basic pipe connections – Mixed pipe material connection – Pipe connections with different joining components.
(e) Demonstration of plumbing requirements of high-rise buildings.

Carpentry using Power Tools only:
(a) Study of the joints in roofs, doors, windows and furniture.
(b) Hands-on-exercise:
   - Wood work, joints by sawing, planing and cutting.

II MECHANICAL ENGINEERING PRACTICE

Welding:
(a) Preparation of arc welding of butt joints, lap joints and tee joints.
(b) Gas welding practice

Basic Machining:
(a) Simple Turning and Taper turning
(b) Drilling Practice

Sheet Metal Work:
(a) Forming & Bending:
(b) Model making – Trays, funnels, etc.
(c) Different type of joints.

Machine assembly practice:
(a) Study of centrifugal pump
(b) Study of air conditioner

Demonstration on:
(a) Smithy operations, upsetting, swaging, setting down and bending. Example – Exercise – Production of hexagonal headed bolt.
(b) Foundry operations like mould preparation for gear and step cone pulley.
(c) Fitting – Exercises – Preparation of square fitting and vee – fitting models.
GROUP B (ELECTRICAL & ELECTRONICS)

III ELECTRICAL ENGINEERING PRACTICE 10
1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent lamp wiring.
3. Stair case wiring
5. Measurement of energy using single phase energy meter.

IV ELECTRONICS ENGINEERING PRACTICE 13
1. Study of Electronic components and equipments – Resistor, colour coding measurement of AC signal parameter (peak-peak, rms period, frequency) using CR.
2. Study of logic gates AND, OR, EOR and NOT.
4. Soldering practice – Components Devices and Circuits – Using general purpose PCB.
5. Measurement of ripple factor of HWR and FWR.

TOTAL: 45 PERIODS

OUTCOMES:
- ability to fabricate carpentry components and pipe connections including plumbing works.
- ability to use welding equipments to join the structures.
- ability to fabricate electrical and electronics circuits.

REFERENCES:

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

CIVIL
1. Assorted components for plumbing consisting of metallic pipes, plastic pipes, flexible pipes, couplings, unions, elbows, plugs and other fittings. 15 Sets.
2. Carpentry vice (fitted to work bench) 15 Nos.
4. Models of industrial trusses, door joints, furniture joints 5 each
5. Power Tools: (a) Rotary Hammer 2 Nos
   (b) Demolition Hammer 2 Nos
   (c) Circular Saw 2 Nos
   (d) Planer 2 Nos
   (e) Hand Drilling Machine 2 Nos
   (f) Jigsaw 2 Nos

MECHANICAL
1. Arc welding transformer with cables and holders 5 Nos.
2. Welding booth with exhaust facility 5 Nos.
3. Welding accessories like welding shield, chipping hammer, wire brush, etc. 5 Sets.
4. Oxygen and acetylene gas cylinders, blow pipe and other welding outfit. 2 Nos.

5. Centre lathe 2 Nos.
6. Hearth furnace, anvil and smithy tools 2 Sets.
7. Moulding table, foundry tools 2 Sets.
8. Power Tool: Angle Grinder 2 Nos
9. Study-purpose items: centrifugal pump, air-conditioner One each.

ELECTRICAL
1. Assorted electrical components for house wiring 15 Sets
2. Electrical measuring instruments 10 Sets
3. Study purpose items: Iron box, fan and regulator, emergency lamp 1 each
4. Megger (250V/500V) 1 No.
5. Power Tools: (a) Range Finder 2 Nos
   (b) Digital Live-wire detector 2 Nos

ELECTRONICS
1. Soldering guns 10 Nos.
2. Assorted electronic components for making circuits 50 Nos.
3. Small PCBs 10 Nos.
5. Study purpose items: Telephone, FM radio, low-voltage power supply

GE6163 PHYSICS AND CHEMISTRY LABORATORY – I

PHYSICS LABORATORY – I

OBJECTIVES:
- To introduce different experiments to test basic understanding of physics concepts applied in optics, thermal physics and properties of matter.

LIST OF EXPERIMENTS
(Any FIVE Experiments)
1. (a) Determination of Wavelength, and particle size using Laser
   (b) Determination of acceptance angle in an optical fiber.
2. Determination of velocity of sound and compressibility of liquid – Ultrasonic interferometer.
3. Determination of wavelength of mercury spectrum – spectrometer grating
5. Determination of Young’s modulus by Non uniform bending method
6. Determination of specific resistance of a given coil of wire – Carey Foster’s Bridge

OUTCOME:
- The hands on exercises undergone by the students will help them to apply physics principles of optics and thermal physics to evaluate engineering properties of materials.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:
1. Diode laser, lycopodium powder, glass plate, optical fiber.
2. Ultrasonic interferometer
3. Spectrometer, mercury lamp, grating
4. Lee’s Disc experimental set up
5. Traveling microscope, meter scale, knife edge, weights
6. Carey foster’s bridge set up
   (vernier Caliper, Screw gauge, reading lens are required for most of the experiments)
CHEMISTRY LABORATORY- I

OBJECTIVES:
• To make the student to acquire practical skills in the determination of water quality parameters through volumetric and instrumental analysis.
• To acquaint the students with the determination of molecular weight of a polymer by vacometry.

LIST OF EXPERIMENTS
(Any FIVE Experiments)

1. Determination of DO content of water sample by Winkler’s method.
2. Determination of chloride content of water sample by argentometric method.
3. Determination of strength of given hydrochloric acid using pH meter.
4. Determination of strength of acids in a mixture using conductivity meter.
5. Estimation of iron content of the water sample using spectrophotometer.
   (1,10-phenanthroline / thiocyanate method).
7. Conductometric titration of strong acid vs strong base.

TOTAL: 30 PERIODS

OUTCOME:
• The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related parameters.

REFERENCES:

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

1. Iodine flask - 30 Nos
2. pH meter - 5 Nos
3. Conductivity meter - 5 Nos
4. Spectrophotometer - 5 Nos
5. Ostwald Viscometer - 10 Nos

Common Apparatus : Pipette, Burette, conical flask, percelain tile, dropper (each 30 Nos.)
OBJECTIVES:
- To make learners acquire listening and speaking skills in both formal and informal contexts.
- To help them develop their reading skills by familiarizing them with different types of reading strategies.
- To equip them with writing skills needed for academic as well as workplace contexts.
- To make them acquire language skills at their own pace by using e-materials and language lab components.

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

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

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

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

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

TOTAL (L:45+T:15): 60 PERIODS

OUTCOMES:
Learners should be able to
• speak convincingly, express their opinions clearly, initiate a discussion, negotiate, argue using appropriate communicative strategies.
• write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.
• read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentation.
• listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings.

TEXTBOOKS:

REFERENCES:

EXTENSIVE Reading (Not for Examination)

WEBSITES
2. http://owl.english.purdue.edu

TEACHING METHODS:
• Lectures
• Activities conducted individually, in pairs and in groups like individual writing and presentations, group discussions, interviews, reporting, etc
• Long presentations using visual aids
• Listening and viewing activities with follow up activities like discussions, filling up worksheets, writing exercises (using language lab wherever necessary/possible) etc
• Projects like group reports, mock interviews etc using a combination of two or more of the language skills
EVALUATION PATTERN:

Internal assessment: 20%
3 tests of which two are pen and paper tests and the other is a combination of different modes of assessment like
- Project
- Assignment
- Report
- Creative writing, etc.

All the four skills are to be tested with equal weightage given to each.
✓ Speaking assessment: Individual presentations, Group discussions
✓ Reading assessment: Reading passages with comprehension questions graded following Bloom’s taxonomy
✓ Writing assessment: Writing essays, CVs, reports etc. Writing should include grammar and vocabulary.
✓ Listening/Viewing assessment: Lectures, dialogues, film clippings with questions on verbal as well as audio/visual content graded following Bloom’s taxonomy.

End Semester Examination: 80%

MA6251                                        MATHEMATICS – II                  L T P C
                                                3 1 0 4

OBJECTIVES:
- To make the student acquire sound knowledge of techniques in solving ordinary differential equations that model engineering problems.
- To acquaint the student with the concepts of vector calculus needed for problems in all engineering disciplines.
- To develop an understanding of the standard techniques of complex variable theory so as to enable the student to apply them with confidence, in application areas such as heat conduction, elasticity, fluid dynamics and flow of electric current.
- To make the student appreciate the purpose of using transforms to create a new domain in which it is easier to handle the problem that is being investigated.

UNIT I VECTOR CALCULUS 9+3
Gradient, divergence and curl – Directional derivative – Irrotational and solenoidal vector fields – Vector integration – Green’s theorem in a plane, Gauss divergence theorem and Stokes’ theorem (excluding proofs) – Simple applications involving cubes and rectangular parallelepipeds.

UNIT II ORDINARY DIFFERENTIAL EQUATIONS 9+3
Higher order linear differential equations with constant coefficients – Method of variation of parameters – Cauchy’s and Legendre’s linear equations – Simultaneous first order linear equations with constant coefficients.

UNIT III LAPLACE TRANSFORM 9+3
UNIT IV  ANALYTIC FUNCTIONS  9+3
Functions of a complex variable – Analytic functions: Necessary conditions – Cauchy-Riemann equations and sufficient conditions (excluding proofs) – Harmonic and orthogonal properties of analytic function – Harmonic conjugate – Construction of analytic functions – Conformal mapping: \( w = z+k, kz, 1/z, z^2, e^z \) and bilinear transformation.

UNIT V  COMPLEX INTEGRATION  9+3
Complex integration – Statement and applications of Cauchy’s integral theorem and Cauchy’s integral formula – Taylor’s and Laurent’s series expansions – Singular points – Residues – Cauchy’s residue theorem – Evaluation of real definite integrals as contour integrals around unit circle and semi-circle (excluding poles on the real axis).

TOTAL (L:45+T:15): 60 PERIODS

OUTCOMES:
• The subject helps the students to develop the fundamentals and basic concepts in vector calculus, ODE, Laplace transform and complex functions. Students will be able to solve problems related to engineering applications by using these techniques.

TEXT BOOKS:

REFERENCES:

PH6251  ENGINEERING PHYSICS – II  L T P C
3 0 0 3

OBJECTIVES:
• To enrich the understanding of various types of materials and their applications in engineering and technology.

UNIT I  CONDUCTING MATERIALS  9

UNIT II  SEMICONDUCTING MATERIALS  9
Intrinsic semiconductor – carrier concentration derivation – Fermi level – Variation of Fermi level with temperature – electrical conductivity – band gap determination – compound semiconductors - direct and indirect band gap- derivation of carrier concentration in n-type and p-type
semiconductor – variation of Fermi level with temperature and impurity concentration — Hall effect
– Determination of Hall coefficient – Applications.

UNIT III MAGNETIC AND SUPERCONDUCTING MATERIALS 9
Origin of magnetic moment – Bohr magneton – comparison of Dia, Para and Ferro magnetism –
Domain theory – Hysteresis – soft and hard magnetic materials – antiferromagnetic materials –
Ferrites and its applications
Superconductivity: properties – Type I and Type II superconductors – BCS theory of superconductivity(Qualitative) - High T_c superconductors – Applications of superconductors –
SQUID, cryotron, magnetic levitation.

UNIT IV DIELECTRIC MATERIALS 9
Electrical susceptibility – dielectric constant – electronic, ionic, orientational and space charge

UNIT V ADVANCED ENGINEERING MATERIALS 9
Metallic glasses: preparation, properties and applications. Shape memory alloys (SMA):
Characteristics, properties of NiTi alloy, application, Nanomaterials– Preparation -pulsed laser
deposition – chemical vapour deposition – Applications – NLO materials –Birefringence- optical
Kerr effect – Classification of Biomaterials and its applications

OUTCOME:
• The students will have the knowledge on physics of materials and that knowledge will be
used by them in different engineering and technology applications.

TEXT BOOKS:

REFERENCES:

CY6251 ENGINEERING CHEMISTRY - II LT P C
3 0 0 3

OBJECTIVES:
• To make the students conversant with boiler feed water requirements, related problems
and water treatment techniques.
• Principles of electrochemical reactions, redox reactions in corrosion of materials and
methods for corrosion prevention and protection of materials.
• Principles and generation of energy in batteries, nuclear reactors, solar cells, wind mills
and fuel cells.
• Preparation, properties and applications of engineering materials.
• Types of fuels, calorific value calculations, manufacture of solid, liquid and gaseous fuels.

UNIT I WATER TECHNOLOGY 9
Introduction to boiler feed water-requirements-formation of deposits in steam boilers and heat
exchangers- disadvantages (wastage of fuels, decrease in efficiency, boiler explosion) prevention
of scale formation -softening of hard water -external treatment zeolite and demineralization -
internal treatment- boiler compounds (phosphate, calgon, carbonate, colloidal) - caustic
embrittlement -boiler corrosion-priming and foaming- desalination of brackish water –reverse
osmosis.
UNIT II  ELECTROCHEMISTRY AND CORROSION

UNIT III  ENERGY SOURCES

UNIT IV  ENGINEERING MATERIALS
Abrasives: definition, classification or types, grinding wheel, abrasive paper and cloth. Refractories: definition, characteristics, classification, properties – refractoriness and RUL, dimensional stability, thermal spalling, thermal expansion, porosity; Manufacture of alumina, magnesite and silicon carbide, Portland cement- manufacture and properties - setting and hardening of cement, special cement- waterproof and white cement–properties and uses. Glass - manufacture, types, properties and uses.

UNIT V  FUELS AND COMBUSTION

OUTCOME:
- The knowledge gained on engineering materials, fuels, energy sources and water treatment techniques will facilitate better understanding of engineering processes and applications for further learning.

TEXT BOOKS:
1. Vairam S, Kalyani P and SubaRamesh.,”Engineering Chemistry”., Wiley India PvtLtd.,New Delhi., 2011
2. DaraS.S,UmareS.S.”Engineering Chemistry”, S. Chand & Company Ltd., New Delhi , 2010

REFERENCES:
OBJECTIVES:
• To explain the basic theorems used in Electrical circuits and the different components and function of electrical machines.
• To explain the fundamentals of semiconductor and applications.
• To explain the principles of digital electronics
• To impart knowledge of communication.

UNIT I  ELECTRICAL CIRCUITS & MEASUREMENTS  12
Operating Principles of Moving Coil and Moving Iron Instruments (Ammeters and Voltmeters), Dynamometer type Watt meters and Energy meters.

UNIT II  ELECTRICAL MECHANICS  12

UNIT III  SEMICONDUCTOR DEVICES AND APPLICATIONS  12

UNIT IV  DIGITAL ELECTRONICS  12
Binary Number System – Logic Gates – Boolean Algebra – Half and Full Adders – Flip-Flops – Registers and Counters – A/D and D/A Conversion (single concepts)

UNIT V  FUNDAMENTALS OF COMMUNICATION ENGINEERING  12
Communication Systems: Radio, TV, Fax, Microwave, Satellite and Optical Fibre (Block Diagram Approach only).

TOTAL: 60 PERIODS

OUTCOMES:
• ability to identify the electrical components explain the characteristics of electrical machines.
• ability to identify electronics components and use of them to design circuits.

TEXT BOOKS:

REFERENCES:
OBJECTIVES:
- To develop capacity to predict the effect of force and motion in the course of carrying out the design functions of engineering.

UNIT I  BASICS AND STATICS OF PARTICLES  12

UNIT II  EQUILIBRIUM OF RIGID BODIES  12
Free body diagram – Types of supports – Action and reaction forces – stable equilibrium – Moments and Couples – Moment of a force about a point and about an axis – Vectorial representation of moments and couples – Scalar components of a moment – Varignon’s theorem – Single equivalent force - Equilibrium of Rigid bodies in two dimensions – Equilibrium of Rigid bodies in three dimensions

UNIT III  PROPERTIES OF SURFACES AND SOLIDS  12

UNIT IV  DYNAMICS OF PARTICLES  12

UNIT V  FRICTION AND ELEMENTS OF RIGID BODY DYNAMICS  12
Friction force – Laws of sliding friction – equilibrium analysis of simple systems with sliding friction –wedge friction- - Rolling resistance -Translation and Rotation of Rigid Bodies – Velocity and acceleration – General Plane motion of simple rigid bodies such as cylinder, disc/wheel and sphere.

TOTAL : 60 PERIODS

OUTCOMES:
- ability to explain the differential principles applies to solve engineering problems dealing with force, displacement, velocity and acceleration.
- ability to analyse the forces in any structures.
- ability to solve rigid body subjected to dynamic forces.

TEXT BOOKS:

REFERENCES:
GE6261 COMPUTER AIDED DRAFTING AND MODELING LABORATORY LT P C 0 1 2 2

OBJECTIVES:

- To develop skill to use software to create 2D and 3D models.

List of Exercises using software capable of Drafting and Modeling

1. Study of capabilities of software for Drafting and Modeling – Coordinate systems (absolute, relative, polar, etc.) – Creation of simple figures like polygon and general multi-line figures.
2. Drawing of a Title Block with necessary text and projection symbol.
3. Drawing of curves like parabola, spiral, involute using Bspline or cubic spline.
4. Drawing of front view and top view of simple solids like prism, pyramid, cylinder, cone, etc, and dimensioning.
5. Drawing front view, top view and side view of objects from the given pictorial views (eg. V-block, Base of a mixie, Simple stool, Objects with hole and curves).
6. Drawing of a plan of residential building ( Two bed rooms, kitchen, hall, etc.)
7. Drawing of a simple steel truss.
8. Drawing sectional views of prism, pyramid, cylinder, cone, etc,
10. Creation of 3-D models of simple objects and obtaining 2-D multi-view drawings from 3-D model.

Note: Plotting of drawings must be made for each exercise and attached to the records written by students.

TOTAL: 45 PERIODS

OUTCOMES:

- ability to use the software packers for drafting and modeling
- ability to create 2D and 3D models of Engineering Components

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Description of Equipment</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pentium IV computer or better hardware, with suitable graphics facility</td>
<td>30 No.</td>
</tr>
<tr>
<td>2</td>
<td>Licensed software for Drafting and Modeling.</td>
<td>30 Licenses</td>
</tr>
<tr>
<td>3</td>
<td>Laser Printer or Plotter to print / plot drawings</td>
<td>2 No.</td>
</tr>
</tbody>
</table>
OBJECTIVES:
• To introduce different experiments to test basic understanding of physics concepts applied in optics, thermal physics and properties of matter.

LIST OF EXPERIMENTS
(Any FIVE Experiments)
1. Determination of Young’s modulus by uniform bending method
2. Determination of band gap of a semiconductor
3. Determination of Coefficient of viscosity of a liquid – Poiseuille’s method
4. Determination of Dispersive power of a prism - Spectrometer
5. Determination of thickness of a thin wire – Air wedge method
6. Determination of Rigidity modulus – Torsion pendulum

OUTCOME:
• The students will have the ability to test materials by using their knowledge of applied physics principles in optics and properties of matter.

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

1. Traveling microscope, meter scale, Knife edge, weights
2. Band gap experimental set up
3. Burette, Capillary tube, rubber tube, stop clock, beaker and weighing balance
4. Spectrometer, prism, sodium vapour lamp
5. Air-wedge experimental set up.
6. Torsion pendulum set up.
   (vernier Caliper, Screw gauge, reading lens are required for most of the experiments)

CHEMISTRY LABORATORY - II

OBJECTIVES:
• To make the student acquire practical skills in the wet chemical and instrumental methods for quantitative estimation of hardness, alkalinity, metal ion content, corrosion in metals and cement analysis.

LIST OF EXPERIMENTS
(Any FIVE Experiments)
1. Determination of alkalinity in water sample
2. Determination of total, temporary & permanent hardness of water by EDTA method
3. Estimation of copper content of the given solution by EDTA method
4. Estimation of iron content of the given solution using potentiometer
5. Estimation of sodium present in water using flame photometer
6. Corrosion experiment – weight loss method
7. Conductometric precipitation titration using BaCl₂ and Na₂SO₄

TOTAL: 30 PERIODS
OUTCOME:
- The students will be conversant with hands-on knowledge in the quantitative chemical analysis of water quality related parameters, corrosion measurement and cement analysis.

REFERENCES:

LIST OF EQUIPMENT FOR A BATCH OF 30 STUDENTS:

1. Potentiometer - 5 Nos
2. Flame photo meter - 5 Nos
3. Weighing Balance - 5 Nos
4. Conductivity meter - 5 Nos

Common Apparatus : Pipette, Burette, conical flask, percelain tile, dropper (30 Nos each)

GE6263 COMPUTER PROGRAMMING LABORATORY

OBJECTIVES:
The Students should be made to
- Be exposed to Unix shell commands
- Be familiar with an editor on Unix
- Learn to program in Shell script
- Learn to write C programme for Unix platform

LIST OF EXPERIMENTS

1. UNIX COMMANDS
Study of Unix OS - Basic Shell Commands - Unix Editor 15

2. SHELL PROGRAMMING
Simple Shell program - Conditional Statements - Testing and Loops 15

3. C PROGRAMMING ON UNIX
Dynamic Storage Allocation-Pointers-Functions-File Handling 15

TOTAL: 45 PERIODS

OUTCOMES:
At the end of the course the students should be able to:
- Use Shell commands
- Design of Implement Unix shell scripts
- Write and execute C programs on Unix
MA6468 PROBABILITY AND STATISTICS LT P C 3 1 0 4

OBJECTIVES:
- This course aims at providing the required skill to apply the statistical tools in engineering problems.

UNIT I RANDOM VARIABLES 9 + 3
Discrete and continuous random variables – Moments – Moment generating functions – Binomial, Poisson, Geometric, Uniform, Exponential, Gamma and Normal distributions.

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

UNIT III TESTING OF HYPOTHESIS 9 + 3
Sampling distributions - Estimation of parameters - Statistical hypothesis - Large sample test based on Normal distribution for single mean and difference of means - Tests based on t, Chi-square and F distributions for mean, variance and proportion - Contingency table (test for independent) - Goodness of fit.

UNIT IV DESIGN OF EXPERIMENTS 9 + 3
One way and Two way classifications - Completely randomized design – Randomized block design – Latin square design - $2^2$ factorial design.

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

TOTAL (L:45 + T:15): 60 PERIODS

OUTCOME:
The students will have a fundamental knowledge of the concepts of probability. Have knowledge of standard distributions which can describe real life phenomenon. Have the notion of sampling distributions and statistical techniques used in management problems.

TEXT BOOKS:
REFERENCES:

FT6301 TEXTILE FIBRES

OBJEKTIVE:
- To facilitate the students to understand the structural features, investigation techniques of textile fibres, and their influence on the behaviour of textiles.

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

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

UNIT III  MOISTURE ABSORPTION CHARACTERISTICS OF FIBRES

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

UNIT V  ELASTIC RECOVERY BEHAVIOUR OF FIBRES
Elastic recovery and its relation to stress and strain of fibres; mechanical conditioning of fibres and its influence on elastic recovery. Load cycling and extension cycling-their effect on elastic recovery.

OUTCOMES:
Upon completion of the course, the students will be able
- To understand the molecular conformations of textile fibres
- To carryout structural investigations techniques
- To understand the moisture, tensile and elastic behaviour of textile fibres

TOTAL : 45 PERIODS

TEXTBOOKS:
REFERENCES:

TC6302 TECHNOLOGY OF YARN MANUFACTURE  L T P C
                                           3 1 0 4

OBJECTIVES:
- To expose the students to the numbering system used to specify textile yarns
- To enable the students to understand the processes involved in the production of yarn from fibres
- To enable the students to understand the machinery used for the production of yarns using short staple spinning system

UNIT I  GINNING AND BLOWROOM  9

UNIT II  CARDING AND DRAWFRAME  9

UNIT III  COMBER AND SPEEDFRAME  9

UNIT IV  RING FRAME  9

UNIT V  OTHER SPINNING SYSTEMS  9
Principles of yarn manufacture, yarn characteristics and applications of Rotor Spinning, Friction Spinning, Air-jet spinning, Wrap spinning, Core yarn spinning and Self-twist spinning, Twistless spinning.

TOTAL (L : 45 + T : 15) : 60 PERIODS
OUTCOMES:
Upon completion of the course, the students will be able to
- Carry out yarn numbering by different systems
- Understand the processes involved in the production of yarn using short staple spinning system
- Understand the details of machinery used for the production of yarn

TEXTBOOKS:

REFERENCES:

GE6351  ENVIRONMENTAL SCIENCE AND ENGINEERING

OBJECTIVES:
To the study of nature and the facts about environment.
- To finding and implementing 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

Definition, scope and importance of Risk and hazards; Chemical hazards, Physical hazards, Biological hazards in the environment – concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers-Oxygen cycle and Nitrogen cycle – energy flow in the ecosystem – ecological succession processes – 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  10
Definition – causes, effects and control measures of: (a) Air pollution (Atmospheric chemistry-
Chemical composition of the atmosphere; Chemical and photochemical reactions in the
atmosphere - formation of smog, PAN, acid rain, oxygen and ozone chemistry; - Mitigation
procedures- Control of particulate and gaseous emission, Control of SO₂, NOₓ, CO and HC) (b)
Water pollution : Physical and chemical properties of terrestrial and marine water and their
environmental significance; Water quality parameters – physical, chemical and biological;
absorption of heavy metals - Water treatment processes. (c) Soil pollution - soil waste
management: causes, effects and control measures of municipal solid wastes – (d) Marine
pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards –role of an individual in

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 overutilization of
surface and ground 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. Energy Conversion processes – Biogas – production and uses, anaerobic digestion; 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. Introduction to Environmental Biochemistry: Proteins –
Biochemical degradation of pollutants, Bioconversion of pollutants.
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 – 12 Principles of green chemistry- nuclear
accidents and holocaust, case studies. – wasteland reclamation – consumerism and waste
conservation act –The Biomedical Waste (Management and Handling) Rules; 1998 and
amendments- scheme of labeling of environmentally friendly products (Ecomark). enforcement
machinery involved in environmental legislation- central and state pollution control boards-
disaster management: floods, earthquake, cyclone and landslides.
Public awareness.

UNIT V  HUMAN POPULATION AND THE ENVIRONMENT  6
Population growth, variation among nations – population explosion – family welfare programme –
welfare – Environmental impact analysis (EIA)- GIS-remote sensing-role of information technology
in environment and human health – Case studies.

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 environmental is at infant stage.
- Ignorance and incomplete knowledge has lead to misconceptions
- Development and improvement in std. of living has lead to serious environmental disasters

TEXT BOOKS:
REFERENCES:

FT6302 GARMENT CONSTRUCTION

OBJECTIVES:
To develop knowledge of apparel construction processes

UNIT I LAYING AND CUTTING

UNIT II SEAMS AND STITCHES
The properties of seams, seam types and classes, Stitch types and classes, machine elements in sewing, sewing threads and their basic requirements in sewing, problems in sewing, quality of sewing and standards.

UNIT III GARMENT COMPONENTS AND FUNCTIONAL PURPOSES

UNIT IV STYLES AND OPERATION BREAK DOWN
Operations break down for shirts, trousers, blouses, jackets, dresses. Material flow, cut component progresses, tracking and machinery allocation, labour allocation and skill levels.

UNIT V PRODUCTION PROCESSES
Line set up, production line balancing, different production system, manual system, make through system, batch production system, progressive bundle system, straight line system, progressive bundle system, conveyor belt system, unit production system, modular production system, quick response system and Just in time system.

OUTCOMES:
Upon completion of the course, the student would have

- Overview of the manufacturing process and the industrial equipment used in garment construction.
- Sound knowledge of apparel pre-processing
- Understood different apparel production systems

TEXTBOOKS:
REFERENCES:

FT6303  FASHION EVOLUTION  LT P C
            3 0 0 3

OBJECTIVE:
- To acquaint the student with the history of fashion, its elements, traditional costumes, accessories and embellishments.

UNIT I 12

UNIT II 12
Indian garments from ancient to modern times. Traditional Indian textiles – Motifs, colour combinations, designs. Accessories and embellishments.

UNIT III 12

UNIT IV 9
African and European traditional costumes, colour combination, designs, motifs and accessories.

UNIT V 9
Traditional costumes of Asian countries – Japan, China, Srilanka, Pakistan, Afghanistan and Thailand.

TOTAL: 45 PERIODS

OUTCOME:
Upon completion of the course, the student would develop an understanding of fashion evolution and fashion designing

TEXTBOOKS:

REFERENCES:
FT6311  FASHION ILLUSTRATION LABORATORY  L T P C  0 0 3 2

OBJECTIVE
To train the students in fashion illustration

LIST OF EXPERIMENTS
1. Drawing still objects.
2. Sketching Human body.
3. Sketching of Ideal figure – Men and Women.
4. Creating garment designs.
5. Proportions and style lines illustrations.

TOTAL : 45 PERIODS

OUTCOMES:
Upon completion of this practical course, the student would be able to sketch human body, ideal figures and create garment designs.

LIST OF EQUIPMENT REQUIRED FOR 30 STUDENTS
• Drawing tables - 30 No.

FT6312  FIBRE SCIENCE LABORATORY  L T P C  0 0 3 2

OBJECTIVE:
To train the students on identification of different kinds of fibres based on different tests and measurement of properties of fibres.

LIST OF EXPERIMENTS
1. Identification of fibres by feel, microscopic view, burning behaviour and solubility
   a. Natural cellulose fibres
   b. Natural protein fibres
   c. Regenerated cellulose fibres
   d. Polyamide fibres
   e. Polyester fibres
   f. Polyolefin fibres
2. Determination of density of various fibres by density gradient column
3. Determination of denier of synthetic fibres by gravimetric method
4. Determination of Moisture Regain and Moisture content of fibres
5. Determination of the percentage of spin finish of synthetic fibres
6. Determination of wax content of the cotton fibres
7. Determination of the blend proportion
   a. Natural/ regenerated cellulose
   b. Cellulose/ protein fibres
   c. Cellulose/polyester fibres
   d. Natural cellulose/ regenerated cellulose/polyester
8. Thermo gravimetric analysis of fibres
9. FTIR analysis of polymers and fibres
10. Determination of count of yarn and CV %
11. Determination of yarn Strength (Lea strength) CV% and CSP
13. Determination of yarn evenness and Imperfections
14. Determination of single yarn Twist and CV%
15. Determination of crimp in Yarn

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the student shall be able to
• Identify the given fibres using cross section, dissolution in solvent and burn test practically.
- Determine important properties of fibres
- Determine blend proportion of different fibres in a blended material

**LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS**

1. Microscope – 1 No.
2. Density gradient column-1 No.
3. Weighing balance – 1 No.
4. Conditioning Oven – 1No.
5. Spin finish tester – 1 No.
6. Thermogravimetric analyzer -1 No.
7. FTIR Spectrometer -1 No.

**GE6674 COMMUNICATION AND SOFT SKILLS- LABORATORY BASED**

**OBJECTIVES:**
To enable learners to,
- Develop their communicative competence in English with specific reference to speaking and listening
- Enhance their ability to communicate effectively in interviews.
- Strengthen their prospects of success in competitive examinations.

**UNIT I LISTENING AND SPEAKING SKILLS**

Conversational skills (formal and informal)- group discussion- making effective presentations using computers, listening/watching interviews conversations, documentaries. Listening to lectures, discussions from TV/ Radio/ Podcast.

**UNIT II READING AND WRITING SKILLS**

Reading different genres of tests ranging from newspapers to creative writing. Writing job applications- cover letter- resume- emails- letters- memos- reports. Writing abstracts- summaries- interpreting visual texts.

**UNIT III ENGLISH FOR NATIONAL AND INTERNATIONAL EXAMINATIONS AND PLACEMENTS**

International English Language Testing System (IELTS) - Test of English as a Foreign Language (TOEFL) - Civil Service(Language related)- Verbal Ability.

**UNIT IV INTERVIEW SKILLS**

Different types of Interview format- answering questions- offering information- mock interviews-body language( paralinguistic features)- articulation of sounds- intonation.

**UNIT V SOFT SKILLS**

Motivation- emotional intelligence-Multiple intelligences- emotional intelligence- managing changes-time management-stress management-leadership straits-team work- career planning - intercultural communication- creative and critical thinking

**TOTAL: 60 PERIODS**

**Teaching Methods:**
1. To be totally learner-centric with minimum teacher intervention as the course revolves around practice.
2. Suitable audio/video samples from Podcast/YouTube to be used for illustrative purposes.
3. Portfolio approach for writing to be followed. Learners are to be encouraged to blog, tweet, text and email employing appropriate language.
4. GD/Interview/Role Play/Debate could be conducted off the laboratory (in a regular classroom) but learners are to be exposed to telephonic interview and video conferencing.
5. Learners are to be assigned to read/write/listen/view materials outside the classroom as well for graining proficiency and better participation in the class.
Lab Infrastructure:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description of Equipment (minimum configuration)</th>
<th>Qty Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Server</td>
<td>1 No.</td>
</tr>
<tr>
<td></td>
<td>• PIV System</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• 1 GB RAM / 40 GB HDD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• OS: Win 2000 server</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Audio card with headphones</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• JRE 1.3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Client Systems</td>
<td>60 Nos.</td>
</tr>
<tr>
<td></td>
<td>• PIII or above</td>
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</tr>
<tr>
<td></td>
<td>• 256 or 512 MB RAM / 40 GB HDD</td>
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<tr>
<td></td>
<td>• OS: Win 2000</td>
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Evaluation:

Internal: 20 marks

Record maintenance: Students should write a report on a regular basis on the activities conducted, focusing on the details such as the description of the activity, ideas emerged, learning outcomes and so on. At the end of the semester records can be evaluated out of 20 marks.

External: 80 marks

Online Test - 35 marks
Interview - 15 marks
Presentation - 15 marks
Group Discussion - 15 marks

Note on Internal and External Evaluation:
1. Interview – mock interview can be conducted on one-on-one basis.
2. Speaking – example for role play:
   a. Marketing engineer convincing a customer to buy his product.
   b. Telephonic conversation- fixing an official appointment / placing an order / enquiring and so on.
3. Presentation – should be extempore on simple topics.
4. Discussion – topics of different kinds; general topics, and case studies.

OUTCOMES:
At the end of the course, learners should be able to
- Take international examination such as IELTS and TOEFL
- Make presentations and Participate in Group Discussions.
- Successfully answer questions in interviews.

REFERENCES:
2. Graded Examinations in Spoken English and Spoken English for Work downloadable materials from Trinity College, London.
4. Interactive Multimedia Programs on **Managing Time and Stress**.
5. **Personality Development** (CD-ROM), Times Multimedia, Mumbai.

**Web Sources:**
- [http://www.slideshare.net/rohitjsh/presentation-on-group-discussion](http://www.slideshare.net/rohitjsh/presentation-on-group-discussion)
- [http://www.washington.edu/doit/TeamN/present_tips.html](http://www.washington.edu/doit/TeamN/present_tips.html)
- [http://www.oxforddictionaries.com/words/writing-job-applications](http://www.oxforddictionaries.com/words/writing-job-applications)
- [http://www.kent.ac.uk/careers/cv/coveringletters.htm](http://www.kent.ac.uk/careers/cv/coveringletters.htm)
- [http://www.mindtools.com/pages/article/newCDV_34.htm](http://www.mindtools.com/pages/article/newCDV_34.htm)

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**FT6401 PATTERN ENGINEERING I**

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**OBJECTIVE:**
- To introduce students to human anthropometrics from the scientific and technological viewpoint
- To equip students with comprehensive pattern making skills

**UNIT I BASICS OF ANTHROPOMETRICS AND SIZING SYSTEMS**

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 STUDY OF BODY MEASUREMENTS**

Important body measurements across all age groups, Methods of measuring body dimensions, Standard measurement chart-designation and control dimensions.

**UNIT III RUDIMENTS TO PATTERN MAKING**

Functions of pattern making tools, Preparing and Measuring the Form, Trueing, blending, pattern grain line, balance line terms, notches, seam allowance, jog seam, dart points, pleats, flares, gather and true bias.

**UNIT IV BASIC PATTERN SET**

Pattern making - Drafting and draping methods. Basic men’s and women’s block.

**UNIT V PATTERN MAKING - PRINCIPLES**


**TOTAL : 45 PERIODS**

**OUTCOME:**

The course would help the students to develop better understanding on how clothing should be designed, so as to provide not only good fit but also enhance body image

**TEXTBOOKS:**

**REFERENCE:**
OBJECTIVE:
- To acquaint students of the different trims, components, accessories and embellishments used as fashion accessories
- To make them acquire skills essential to evaluate the performance of accessories

UNIT I
Garment components and trimmings – labels and motifs, linings, interlining wadding, lace, braid and elastic, seam binding and tape, shoulder pads, eyelets and laces, zip fasteners, buttons – tack buttons, snap fastener, rivets and other closures. Decorative and functional trimmings – Applique, sequins, beadwork, smocking, and other surface ornamentation – performance, properties, types and application techniques on fabrics and garments.

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

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

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

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

TOTAL : 45 PERIODS

OUTCOMES:
Upon completion of the course, the students would be able
- To develop a thorough understanding of the different accessories and embellishments their performance, properties and application
- To independently hint accessories apt for different garment styles

TEXTBOOK:

REFERENCE:
UNIT I  FABRIC INSPECTION AND SPREADING MACHINES  9

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

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

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

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

TOTAL : 45 PERIODS

OUTCOME:
Upon completion of the course, the students would understand the fundamental principles and working of garment production machinery and the interrelationship of assembly methods.

TEXTBOOKS:

REFERENCE:

TT6402  FABRIC STRUCTURE  LT P C
3  0  0  3

OBJECTIVE:
To enable the students to learn about structure of fabric and design the structure for different applications.

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

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

TEXTBOOKS:

REFERENCES:

FT6404 TEXTILE CHEMICAL PROCESSING I

OBJECTIVES:
• To acquaint student of the operational sequence in wet processing of different textile materials
• To impart knowledge in the field of pre-processing, processing and post-processing of textile substrate
• To impart fundamental knowledge of colour science and assessment of dyed and printed goods

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:
At the completion of the course, the student would be able to develop a thorough knowledge on
- Chemical processing of textile materials
- Dyeing and printing methods and principles of colour application
- Assessment of fastness properties of dyed and printed goods

TEXTBOOKS:

REFERENCES:

TC6405 TECHNOLOGY OF FABRIC MANUFACTURE LT P C 3 1 0 4

OBJECTIVES:
The main objective of this course is to enable the students to understand
- Preparatory processes involved in the production of fabric
- Basics of weaving and knitting processes
- Basics of nonwoven production methods

UNIT I PREPARATION OF YARNS FOR WEAVING AND KNITTING

UNIT II  PLAIN POWER LOOM  9
Types of looms - Primary, secondary and auxiliary mechanisms of loom, - Classification of weaving machines. Shedding - Tappet shedding, Shuttle Picking mechanism – Beat-up mechanism. Stop motions – Friction Let – off motion - Negative let off and positive let off motions. Take- up motion - Five wheel take up motion, Seven wheel take up motion, Positive continuous take up motion. Warp protector Mechanisms - Loose Reed and Fast Reed Mechanisms, Warp Stop Motions, Weft stop motions, temples, lease rods and brake. Weaving faults. Brief study about drop box loom and Terry loom.

UNIT III  DOBBY AND JACQUARD SHEDDING  9

UNIT IV  SHUTTLELESS WEAVING  9

UNIT V  BONDED FABRICS & KNITTING  9

TOTAL (L : 45 + T : 15) : 60 PERIODS

OUTCOMES:
Upon completion of the course, the students will be able to
- Explain the preparatory processes involved in the production of fabrics
- Explain the principles of different fabric production methods
- Identify various fabric defects and their causes and remedies

TEXT BOOKS:

REFERENCES:

TT6461  FABRIC STRUCTURE LABORATORY  L T P C 0 0 3 2

OBJECTIVE:
To train the students in analyzing the cloth to identify construction parameters and prepare design, draft and peg plan.

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

TOTAL : 45 PERIODS

OUTCOMES:
Upon completion of the lab the student will be able
- Identify the constructional parameters of fabric
- Construct design, draft and peg plan for weaving the fabric
- Analyse the blend composition of yarn used in the fabric and the type of finish applied in the fabric

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS
2. GSM Cutter – 1 No.
4. Crimp Tester – 1 No.
5. Electronic balance – 1 No.

FT6411 PATTERN ENGINEERING LABORATORY – I

OBJECTIVE:
To train the students in pattern making of apparels.

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. Single dart series slash spread technique
5. Single dart series pivotal transfer technique
6. Double dart series slash spread technique
7. Double dart series pivotal transfer technique.

TOTAL : 45 PERIODS

OUTCOME:
Upon completion of this practical course, the student would have practical experience on pattern making of garments

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS
• Working surface – pattern making / cutting table (polished or laminated top)
• Fabric and paper scissors - 15 No.
• Rulers – 12” and 36” - 15 No.
• Tailor’s square – 24” x 14” - 15 No.
• Curve rules – French curves, hip curves and vary form curve - 15 No.
• Pattern notcher, tracing wheel, awl - 5 No.
• Measuring tape - 30 No.
• Pattern weights - 10 No.
• Dress forms (Full and Half) – Kids, Children’s, Women’s and Men’s - 3 Each

FT6412 GARMENT CONSTRUCTION LABORATORY - I

OBJECTIVE:
To train the students in construction of garments

LIST OF EXPERIMENTS
1. Stitch classification and stitch properties.
2. Formation of Stitch classes.
3. Seam classification and common uses.
5. Button hole and button stitch machine.
6. Study of Feed-of-the-arm machine.
7. Assembling of various garment components using appropriate seams.

TOTAL : 45 PERIODS

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.

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS

• High speed industrial sewing machines
  - Single needle lock stitch machine - 30 No.
  - Double needle lock stitch machine - 02 No.
  - Over-lock machine - 02 No.
  - Feed-of-the-arm machine - 01 No.
  - Button stitch machine - 01 No.
  - Button hole machine - 01 No.
  - Flat lock machine - 01 No.
  - Zigzag machine - 01 No.
• Straight knife cutting machine - 01 No.
• Steam pressing table (Desirable) - 01 No.
• Iron box (electric) - 04 No.

FT6501 TEXTILE CHEMICAL PROCESSING - II

OBJECTIVES:
• To acquaint student with different types of textile finishing and its assessment
• Have knowledge of garment dyeing, printing and washing
• Have knowledge of dyes, auxiliaries and eco friendly chemical processes

UNIT I
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
Standard methods of assessment of all the above finishes

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

UNIT IV
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
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 this course, the students will be able
• To develop thorough knowledge in textile and garment finishing.
• To sensitize the hazardous and banned dyes, chemical and auxiliaries
• To work in a textile wet processing industry

TEXTBOOKS:

REFERENCES:

UNIT III FABRIC TESTING

UNIT IV DRAPE MEASUREMENT

UNIT V APPAREL TESTING

TOTAL : 45 PERIODS

OUTCOMES:
The student will have knowledge on
- Methods by which the physical and mechanical properties of textile materials and products are measured and investigated
- Sampling and yarn quality parameters testing
- Fabric and garment quality parameters testing

TEXTBOOKS:

REFERENCES:
Reasons for the growth of the knitting industry. Comparisons of fabric properties - wovens, knits and bonded fabrics; classification of knitting processes – weft and warp knitting; yarn quality requirements for knitting. Preparation of staple yarns for weft and warp knitting.

UNIT II  
FUNDAMENTALS OF KNITTING  
9
General definitions and principles of knitting; Types of knitting needles – bearded, latch & compound needle. Elements of knitted loop structure.

UNIT III  
WEFT KNITTING  
9
Basic weft knitted structures and their production - plain, rib, interlock and purl; Fundamentals of formation of knit, tuck and float stitches; factors affecting the formation of loop; effect of loop length and shape on fabric properties; Analysis of various types of weft knitted structure. Weft knitted fabric geometry.

UNIT IV  
WEFT KNITTING MACHINES  
9
Construction, Characteristics and working of circular knitting machines used for the production of basic structures; production of derivatives of weft knitted structures; needle control in circular knitting machines; quality control in knitted fabric production; production calculation. Basic principles and elements of flat knitting machines; different types of flat knitting machines - manual, mechanical and computer controlled; production of various weft knitted structures using flat knitting machines.

UNIT V  
WARP KNITTING  
9
Basic principles; elements of warp knitted loop – open loop, closed loop; warp knitting elements-chain link, chain links for simple patterns, guide bar movement mechanism,. Tricot and Rachel warp knitting machines. Principles of double needle bar patterning, Terry pile fabric production. Let off system; run in value based on the lapping diagram; take up system; theoretical concepts of warp knitted loop configuration; Uses of warp knitted fabrics in technical applications.

TOTAL : 45 PERIODS

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

- Principle of knitting by different types of knitting machines
- Structure and properties of fabric produced by different knitting machines

TEXTBOOKS:

REFERENCES:
7. Die Maschenbindungen der Kettenwirkerai, “An Introduction to the Stitch Formations in Warp Knitting”, Published Employee’s Association, Karl Mayere.V., Germany, 1966
OBJECTIVES:
To educate the students in techniques and machinery for dyeing and finishing of garments and to impart knowledge on different garment care techniques.

UNIT I

UNIT II

UNIT III

UNIT IV
Principles of laundering – stain removal – various solvents for stain removing blood, tea, rust, oil/grease etc. – different methods of washing – application of friction by hand rubbing – scribing – tumble wash

UNIT V

OUTCOMES:
The students would have knowledge on
- Dyeing techniques for apparel
- Applying of different finishes on garments
- Machinery and equipments for garment care

TEXT BOOKS:

REFERENCES:
FT6504       APPAREL PRODUCTION PLANNING AND CONTROL       L T P C
                      3 0 0 3

OBJECTIVES:
- To emphasize 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 area, operation wise machinery allocation, usage of special attachments and tools for operation simplifications, production grid and flow chart.

UNIT III
Cutting techniques, cutting room controls, lay lot planning, bundle distributions, modern methods in cut piece distribution and tracking different manufacturing systems, mass customisation and made to order manufacturing systems advantages disadvantages and control measures in sewing.

UNIT IV
Production planning -Production floor balancing, 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, conveyor system and control parameters.

UNIT V
Quality control in product development, quality control in printing, embroidery, washing and other accessories, quality planning, preproduction meetings and quality procedures, production meetings, in line inspection, final inspection, rescreening conditions and final inspections. Packing - Ratio packing, solid packing, short shipment, excess shipment, calculation of volumetric weight, carton dimension other requirements.

TOTAL : 45 PERIODS

OUTCOME:
The course will enable students to practise better methods in apparel production and planning to take informed business decisions in the apparel industry

TEXTBOOKS:

REFERENCES:
OBJECTIVE:
- To develop better understanding on pattern construction, grading and pattern alteration techniques to provide good fit

UNIT I  PATTERNS FOR COLLARS AND SLEEVES  9
Collar classification and terms, basic shirt collar, Peter Pan collar, sailor collar, mandarin collar, built-up necklines, Cowls, Sleeve cap, sleeve cuffs, puff, petal, lantern and leg-of-mutton sleeves.

UNIT II  PATTERNS FOR POCKET, PLACKET AND FACINGS  6
Pocket classification, outside pockets, inserted pocket and side-seam pocket. Pointed, Slit opening and Wing collar plackets. Facing patterns for cutout necklines and armholes.

UNIT III  FOUNDATIONS FOR TOPS AND BOTTOM WEAR  12

UNIT IV  PATTERN FOR KNITS, ACTION WEAR AND SWIMWEAR  9

UNIT V  PATTERN ALTERATIONS AND GRADING  9
Pattern alteration for fit, Factors affecting the pattern making process. Grading process, grade rules, and types of grading system.

TOTAL : 45 PERIODS

OUTCOMES:
The course will enable the students to have knowledge on
- Need for basic foundation patterns
- Body suit foundation and its variations
- Different styles of collar and sleeve patterns
- Procedural illustrations to stimulate the creative imaginations of students

TEXTBOOKS:

OBJECTIVE:
To train the students in pattern engineering of garments

LIST OF EXPERIMENTS
Development of patterns using drafting method of pattern making
1. Women’s formal, casual and party wears
2. Men’s formal, casual and party wears.
3. Children’s - uniforms, playtime wear and sleep suits.
4. Grading of patterns
Development of patterns using draping method of pattern making
1. Basic bodice – front and back
2. Bodice with dart variations
3. Gored, flared skirts, Jeans, jumpsuits
4. Sleeve’s, collar (convertible, peter-pan collar, turtle neck collar, shawl collar).
5. Neckline cowl, side seam cowl, bias cowl.

TOTAL : 45 PERIODS

OUTCOMES:
Upon completion of this practical course, the students will be able to
• Develop patterns for women’s, men’s and children’s garments
• Do grading of patterns
• Develop patterns for basic bodice, gored, flared skirts, jeans and jumpsuits

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS
• Working surface – pattern making / cutting table (polished or laminated top)
• Fabric and paper scissors - 15 No.
• Rulers – 12” and 36” - 15 No.
• Tailor’s square – 24” x 14” - 15 No.
• Curve rules – French curves, hip curves and vary form curve - 15 No.
• Pattern notcher, tracing wheel, awl - 5 No.
• Measuring tape - 30 No.
• Pattern weights - 10 No.
• Dress forms (Full and Half) – Kids, Children’s, Women’s and Men’s - 3 Each

FT6512 TEXTILE CHEMICAL PROCESSING LABORATORY

OBJECTIVE:
To train the students in pre treatment and wet processing of textile materials

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

TOTAL : 45 PERIODS

OUTCOME:
Upon completing this practical course, the student would be able to desize, bleach, dye, print and finish the fabric with different types of chemicals and colourants

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS
1. Stainless vats (500 ml)
2. Water bath, Thermometers

54
3. Stirrer  
4. Steam ager  
5. Pilot padding mangle  
6. HTHP Beaker dyeing machine  
7. Pilot curing chamber  
8. Fastness tester for Washing, Light, Perspiration & Rubbing  
9. Printing table  
10. Spectrophotometer  

OBJECTIVE:  
To impart knowledge of fabric and garment quality parameters testing.  

LIST OF EXPERIMENTS  
Determination of  
1. Fabric tensile, tear and bursting strength  
2. Fabric flexural rigidity, bending modulus and drapability  
3. Fabric crease and wrinkle recovery  
4. Fabric abrasion and pilling resistance tests  
5. Fabric air permeability  
6. Fabric surface roughness and friction coefficient  
7. Determination of seam strength and seam slippage  
8. Determination of fabric shrinkage, washing and crocking fastness (knitted and woven)  
10. Zipper endurance, slider pull-off strength tests  

TOTAL: 45 PERIODS  

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

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS  

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<td>Wrinkle recovery tester</td>
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<td>Fabric Drape meter</td>
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FT6601  CLOTHING SCIENCE  L T P C  3 0 0 3

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

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

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

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

TOTAL : 45 PERIODS

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.

TEXTBOOKS:

REFERENCE:

FT6602  SPECIALITY FABRICS AND TECHNOLOGY  L T P C  3 0 0 3

OBJECTIVE:
  • To facilitate the understanding of structure and formation of speciality textile materials

UNIT I
Scope of speciality fabrics-fibres, yarns and fabrics. Structure and formation of fancy, core and coloured yarns.

UNIT II
9
Tape looms, needle looms, crochet and knitting machines for manufacture of narrow width products; tapes, ribbon, elastic, laces, woven labels – its production techniques, properties and applications.

UNIT III  12
Weft knitted structures - Blister jacquard, plush, pile, velour and fleecy fabrics. Directionally oriented warp knitted structures. Classification of braided structure, production techniques, properties and applications.

UNIT IV  9
Lining and interlining, fusible and non-fusible interlining-functional requirements-factors influencing fusing-material and machine parameters. Fusing methods-quality assurance in fusing.

UNIT V  6
Coating – requirements – scope - application methods.

OUTCOMES:
This course enables
- To acquaint student with the scope of speciality fabrics and its application
- The student understand the production techniques used in the manufacture of speciality fabrics
- To provide an advanced text for engineering and technology students, to bridge the gap between graduate studies and practical work operations for design and subsequent profitable operation of advanced textile mill catering to speciality fabrics

TEXTBOOKS:

REFERENCES:

FT6603  FASHION FORCASTING  L T P C
3 0 0 3

OBJECTIVE:
To impart knowledge on principles marketing, marketing research. Domestic and international market.

UNIT I  9
Fashion market and marketing environment – market research – evaluating the collections - Fashion consumer – Consumer influence on market.

UNIT II  9
Fashion, Fad, style – Application – Society Fashion and individual fashion – their Coordination - wardrobe.

UNIT III  9
UNIT IV
Fashion marketing research – Purpose of research - research design & data sources – Sampling methods – data Collection – Forecasting Fashion – Market Segmentation - marketing mix.

UNIT V

OUTCOME:
The students will have understanding on principles of marketing, factors affecting domestic and international market, fashion trends and consumer behaviour.

TEXTBOOKS:

REFERENCE:
TEXT BOOKS:

REFERENCES:

FT6605 INDUSTRIAL ENGINEERING IN APPAREL INDUSTRY L T P C
3 0 0 3

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

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

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

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

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

TOTAL : 45 PERIODS

OUTCOMES:
Upon completion of this course the student will be able to apply the following methodologies in apparel industry.
- Method study, work measurement
- Layout study and line balancing
- Statistical process control

TEXTBOOKS:
REFERENCES:

FT6606 APPAREL MARKETING AND MERCHANDISING L T P C
3 0 0 3

OBJECTIVE:
- To acquaint the students of the concepts of business, merchandising, sourcing and export documentation

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

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

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

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

UNIT V EXPORT DOCUMENTATION AND POLICIES

TOTAL : 45 PERIODS
OUTCOMES:
Upon completion of this course, the student shall be able to apply
- Concept of marketing and merchandizing in the apparel industry in India
- Procedure involved in the export of apparel

TEXTBOOKS:

REFERENCE:

FT6611 GARMENT CAD LABORATORY

OBJECTIVE:
To train the students in CAD used for pattern making of garments

LIST OF EXPERIMENTS
1. Development of the 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. Reverse pattern Engineering
10. Grading rules
11. Marker planning and optimisation

TOTAL : 45 PERIODS

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

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS
- Computer with Marker planning software - 15 No.
- Pattern Digitizer - 02 No.
- Printer / plotter (above 42”) - 01 No.

FT6612 GARMENT CONSTRUCTION LABORATORY – II

OBJECTIVE:
To train the students in construction of garments

LIST OF EXPERIMENTS
1. Sewing and finishing formal men’s top wear.
2. Sewing and finishing formal men’s bottom wear.
3. Sewing and finishing basic women’s top wear.
4. Sewing and finishing basic women’s bottom wear.
5. Sewing and finishing kid’s wear. 

**OUTCOME :**
Upon completion of this practical course, the student will be able to sew and finish different types of wears.

**LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS**

- Folding clips ¼", ½", 3". - 2 each
- Rib cutting machines - 1
- Single needle lock stitch machine - 15
- Flat lock machine with elastic attachment - 1
- Feed off the arm machine - 1
- Over lock machine - 3
- Button holing & button stitching machine - 1 each
- Cylinder bed Sewing machines - 1 (Preferable)
- Collar & Cuff recessing machine - 1 (Preferable)

**CONSUMABLES:**

(To be brought by students)

- Needles
- Canvas material
- Sewing threads
- Fusing canvas
- Elastics
- Sponge
- Draw cords
- Fasteners

**FT6613 MINI PROJECT AND DESIGN COLLECTION**

**OBJECTIVES:**
To understand Fashion Forecasting w.r.t colour, pattern and materials used
- learn to prepare story / mood board
- learn about design details, fabrics and accessories
- To develop garments

**EXPERIMENTS**
Preparation of garments as per the current trend / design style.
Preparation of costing sheet for each garment designed
Documenting the Design Collection in suitable format and Final Presentation

(Minimum of 4 garments is to be developed in the course)

TOTAL : 45 PERIODS

**FT6701 VISUAL MERCHANDISING**

**L T P C**
0 0 3 2

**EXPERIMENTS**
Preparation of garments as per the current trend / design style.
Preparation of costing sheet for each garment designed
Documenting the Design Collection in suitable format and Final Presentation

(Minimum of 4 garments is to be developed in the course)

TOTAL : 45 PERIODS
OBJECTIVES:
- To introduce the student to the fashion business segments
- To acquaint the students with fashion communication tools

UNIT I 9

UNIT II 12
Visual display - Fashion communication – Visual / 3D visual – Elements of visual merchandising. Visual merchandising as a communication tool, presentations in visual merchandising, visual merchandising and enhanced customer buying decision, interiors with respect to brand, 65 sensory elements, signs and graphics, focal point for season and type of sale.

UNIT III 12
Objectives of Store planning, location, design, retail image mix, and layout, the circulation plan for retail formats and a generic apparel and fashion store, buying, mark-up and mark-down in merchandise management, private apparel brands and labels. – windows - interiors – optimizing techniques in retail space. Study on apparel franchising, franchising in India.

UNIT IV 6

UNIT V 6

TOTAL : 45 PERIODS

OUTCOMES:
The course would
- develop sound knowledge on store planning and optimizing apparel assortments
- prepare the students with knowledge on visual merchandising concepts

TEXTBOOKS:

REFERENCES:
1. Frings G. S. “Fashion-from concept to consumer”.
and Crosby - Barriers to TQM - Quality statements - Customer focus - Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Costs of quality.

UNIT II TQM PRINCIPLES 9
Leadership - Strategic quality planning, Quality Councils - Employee involvement - Motivation, Empowerment, Team and Teamwork, Quality circles Recognition and Reward, Performance appraisal - Continuous process improvement - PDCA cycle, 5S, Kaizen - Supplier partnership - Partnering, Supplier selection, Supplier Rating.

UNIT III TQM TOOLS AND TECHNIQUES I 9
The seven traditional tools of quality - New management tools - Six sigma: Concepts, Methodology, applications to manufacturing, service sector including IT - Bench marking - Reason to bench mark, Bench marking process - FMEA - Stages, Types.

UNIT IV TQM TOOLS AND TECHNIQUES II 9

UNIT V QUALITY SYSTEMS 9

TOTAL: 45 PERIODS

OUTCOME:
- The student would be able to apply the tools and techniques of quality management to manufacturing and services processes.

TEXTBOOK:

REFERENCES:

MG6089 SUPPLY CHAIN MANAGEMENT L T P C
3 0 0 3

OBJECTIVE:
- To provide an insight on the fundamentals of supply chain networks, tools and techniques.

UNIT I INTRODUCTION 5
Role of Logistics and Supply chain Management: Scope and Importance- Evolution of Supply Chain -Decision Phases in Supply Chain - Competitive and Supply chain Strategies – Drivers of Supply Chain Performance and Obstacles.

UNIT II SUPPLY CHAIN NETWORK DESIGN 10
UNIT III LOGISTICS IN SUPPLY CHAIN
Role of transportation in supply chain – factors affecting transportation decision – Design option for transportation network – Tailored transportation – Routing and scheduling in transportation.

UNIT IV SOURCING AND COORDINATION IN SUPPLY CHAIN
Role of sourcing supply chain supplier selection assessment and contracts- Design collaboration - sourcing planning and analysis - supply chain co-ordination - Bull whip effect – Effect of lack of co-ordination in supply chain and obstacles – Building strategic partnerships and trust within a supply chain.

UNIT V SUPPLY CHAIN AND INFORMATION TECHNOLOGY
The role IT in supply chain- The supply chain IT frame work Customer Relationship Management – Internal supply chain management – supplier relationship management – future of IT in supply chain –E-Business in supply chain.

TOTAL : 45 PERIODS

OUTCOME:
• The student would understand the framework and scope of supply chain networks and functions.

TEXTBOOK:

REFERENCES:

FT6702 HOME TEXTILES L T P C
3 0 0 3

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

UNIT I FURNISHINGS

UNIT II FLOOR COVERINGS
Recent Developments in manufacturing of floor coverings -Hard Floor Coverings, Resilient Floor Coverings, Soft Floor Coverings, Rugs, Cushion and Pads – Care of floor coverings.

UNIT III CURTAINS AND DRAPERIES

UNIT IV HOME FURNISHING
Advances in period style in, Different styles, and use of Colours, design & texture in home furnishing. Developments in living room furnishing including upholstery, Wall Hangings, Cushion, Cushion Covers, Bolster and Bolster Cover.
UNIT V  BED LINENS

TOTAL : 45 PERIODS

OUTCOMES:
Upon completion of this course, the student shall be able to
- Know about different types of home textiles
- Understand the production method of different types of home textile products

TEXTBOOKS:

REFERENCE:

FT6711  APPAREL ENGINEERING AND PRODUCT DEVELOPMENT
LABORATORY

OBJECTIVE:
To train the students in apparel engineering including sourcing of fabrics and designing of apparel

LIST OF EXPERIMENTS
1. Design of Apparel for specific enduse applications.
2. Sourcing of suitable fabric for the intende d applications.
3. Development of patterns for the design
4. Sewing and finishing of Apparel product for specific enduse applications.

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the student would be able to
- Source the fabric and design the apparel for specific end uses
- Sew and finish the apparel for specific end uses

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS
- Working surface – pattern making / cutting table (polished or laminated top)
- Fabric and paper scissors - 15 No.
- Rulers – 12” and 36” - 15 No.
- Tailor’s square – 24” x 14” - 15 No.
- Curve rules – French curves, hip curves and vary form curve - 15 No.
- Pattern notcher, tracing wheel, awl - 5 No.
- Measuring tape - 30 No.
- Pattern weights - 10 No.
- Dress forms (Full and Half) – Kids, Children’s, Women’s and Men’s - 3 Each
- High speed industrial sewing machines
- Single needle lock stitch machine - 30 No.
- Double needle lock stitch machine - 02 No.
- Over-lock machine - 02 No.
- Feed-of-the-arm machine - 01 No.
- Button stitch machine - 01 No.
- Button hole machine - 01 No.
- Flat lock machine - 01 No.
- Zigzag machine - 01 No.
- Straight knife cutting machine - 01 No.
- Steam pressing table - 01 No.
- Iron box (electric) - 04 No.

GE6773 PRESENTATION SKILLS AND TECHNICAL SEMINAR LT P C 0 0 2 1

OBJECTIVES:
- To encourage the students to study advanced engineering developments
- To prepare and present technical reports.
- To encourage the students to use various teaching aids such as over head projectors, power point presentation and demonstrative models.

METHOD OF EVALUATION:

During the seminar session each student is expected to prepare and present a topic on engineering/technology, for a duration of about 8 to 10 minutes. In a session of three periods per week, 15 students are expected to present the seminar. Each student is expected to present at least twice during the semester and the student is evaluated based on that. At the end of the semester, he/she can submit a report on his/her topic of seminar and marks are given based on the report. A Faculty guide is to be allotted and he/she will guide and monitor the progress of the student and maintain attendance also. Evaluation is 100% internal.

TOTAL: 30 PERIODS

OUTCOMES:
The course will improve the student’s
- Ability to review, prepare and present technological developments
- Ability to face the placement interviews

FT6001 FASHION PHOTOGRAPHY LT P C 3 0 0 3

OBJECTIVES:
- To educate on principles of photography. Different techniques and lighting methods
- To educate on different types of photography equipments. Photography for different media, printing techniques.
- To impart knowledge on videography and computer applications in photography.

UNIT I

UNIT II
Image capture – parts of camera classification and types of camera – Applications Disadvantages. Light – Natural, artificial, flash and strobe.
UNIT III
Photography techniques and equipment for different fields. Basic, studio, location portraiture, Photojournalism, Fashion Photography, wedding photography – Fashion shows.

UNIT IV
Exposure and processing of colour and black and white films. Different techniques in developing. Printing – definitions – Methods of printing for black & white color.

UNIT V

OUTCOMES:
The students would have enhanced their knowledge on
- Different photography techniques and equipments.
- Different printing techniques.

TEXTBOOK:

REFERENCE:

FT6002 INTIMATE APPARELSTOTAL : 45 PERIODS
L T P C 3 0 0 3

OBJECTIVE:
- To acquaint student on the design, material, accessories and sewing aspects of intimate garments

UNIT I
Intimate apparels – Definition, classification, materials-fiber, 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, tanga, 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 – waist petticoats, panties, camisoles, tube top, shape wear, bikini and bra.

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.

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

REFERENCE:

FT6003 GARMENT TRIMS AND ACCESSORIES L T P C
3 0 0 3

OBJECTIVE:
- To introduce students to different trims, components and fashion accessories used in apparel industry to enhance value addition

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

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

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

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

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

TOTAL : 45 PERIODS

OUTCOME:
The students would develop a capacity to offer cum use appropriate fashion accessories to enhance over-all appearance of the ensemble

TEXTBOOK:

REFERENCE:
OBJECTIVES:

- To make the student acquire sound knowledge of the material characteristics required for functional clothing
- To acquaint student of the mechanism, chemistry and evaluation of chemical finishes for the functional textiles

UNIT I FIBRES, YARNS AND FABRICS FOR FUNCTIONAL APPARELS

Characteristic requirements of fiber, yarn and fabric for flame proof, heat resistant, ballistic resistance, electrical conduction, bacterial protection, radiation protection and radiation contamination protection

UNIT II CHEMICAL FINISHES FOR FUNCTIONAL FABRICS

Mechanism, Chemistry, Materials and methods - Flame retardant, Liquid repellent, Antistatic, Antibacterial, UV protection and mite protection finishes

UNIT III FUNCTIONAL APPARELS IN DIFFERENT APPLICATIONS

Functional fabrics used in the medical field and in hygiene; military combat clothing; protective fabrics against biological and chemical warfare; textiles for high visibility

UNIT IV PROTECTIVE GARMENT CONSTRUCTION

Garment construction - method of construction of garments according to various protective end uses; use of accessories for protective garment

UNIT V EVALUATION OF FUNCTIONAL APPARELS

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

TOTAL: 45 PERIODS

OUTCOME:
The students would develop and understanding of the materials, mechanism, chemistry and evaluation of functional garments

TEXTBOOKS:


REFERENCES:

OBJECTIVE:
- To make the student acquire sound knowledge of material characteristics required for protective clothing

UNIT I  FIBRES, YARNS AND FABRICS FOR PROTECTIVE GARMENTS  9
Selection of fibres-suitability and properties of high performance fibres for various protective clothing, chemical composition and physical structure, characteristics and working of various fibres according to different end uses like thermal protection, ballistic protection, anti-microbial protection, Protection against cold etc.
Yarn and fabric (knitted, woven and Non-woven) parameters, their methods of production, effect of structure on their performance; use of composite materials in yarn and fabric formation used for protective end uses.

UNIT II  CHEMICAL FINISHES FOR PROTECTIVE GARMENTS  9
Use of coated fabrics – different types of finishes like fire retardant finishes, for different textile materials, water repellent finishes, anti-microbial finishes; chemical finishes against radiation and chemicals – method of application of those finishes; machines and techniques used for such applications; protective finishes for health care garments.

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

UNIT IV  GARMENT CONSTRUCTION  9
Garment construction - method of construction of garments according to various protective end uses like protection against cold, heat, chemical, ballistic protection etc.; use of different fabric type - knitted, woven, and Non-woven; coated / laminated in protective applications different places; use of inter lining and composites.

UNIT V  EVALUATION OF PROTECTIVE GARMENTS  9
Evaluation of protective fabrics - desirable properties of protective textiles, method of testing for thermal protective performance, water, cold, abrasion and wear resistance; evaluation of resistance in to mildew, ageing, sunlight, chemical, electrostatic and electrical resistivity, impact properties; ASTM standards for protective garments.

TOTAL : 45 PERIODS

OUTCOME:
The students would develop an understanding of the materials, chemical finishes, garment construction and evaluation methods of protective garments

TEXTBOOKS:

REFERENCES:
FT6006  APPAREL SIZE AND FIT ANALYSIS  L T P C  3 0 0 3

OBJECTIVE:
The course is aimed at providing an overview of sizing system and its impact on the fit of the constructed silhouettes.

UNIT I  12
Anthropometry; Study of body measurements – infants, children’s, women’s and men’s. perception of body appearance; figure analysis; body ideals; height and weight distributions; body proportions.

UNIT II  12
History of sizing system; creating sizing system. Sizing standardization-numbered, lettered sizing-Men’s, Women’s and Children’s. Methods of sizing for mass production of clothing for men, women. Mass customization-sizing technologies and application.

UNIT III  12

UNIT IV  9

TOTAL : 45 PERIODS

OUTCOME:
The students would develop an understanding of the complex issue of sizing and overall garment appearance

TEXTBOOKS:

REFERENCES:
2. Editors of Creative publishing,” The Perfect Fit- classic guide to alter patterns”, Creative publishing international, USA, 2005.

FT6007  LEATHER GARMENT TECHNOLOGY  L T P C  3 0 0 3

OBJECTIVE:
- To introduce the students to the manufacture of leather garments and other production parameters influencing productivity

UNIT I  OVERVIEW AND FABRICATION OF LEATHER GARMENTS – PRODUCTION AND PLANNING  14
Classification of leather garments; Grading and assorting of leathers for leather garments; Property requirements for leather and lining materials; Accessories for leather garments; Various types of fasteners, fittings and other accessories. Alternative materials and their adaptability for garments. Nomenclature used for component identification in various leather garments – Wallet, hand bags, Executive bags etc. operational sequences in leather garments production.

UNIT II FABRICATION OF LEATHER GARMENTS – CUTTING, CLICKING AND ASSEMBLING 5
Hand and machine cutting, knives and tools – Preparation and handling. Pattern interlocking /nesting for material optimization. Factors influencing cutting value. Various types of assembly techniques for leather garments. Pre-assembly and assembly techniques – skiving, splitting, folding, sewing etc.

UNIT III PROCESS SCHEDULING AND LINE BALANCING 4
Quality control measures in leather garment manufacture.

UNIT IV DESIGN AND DEVELOPMENT 12
Basic design development – measurement /sizing for various types of leather garments – pattern grading for leather garments. CAD application for leather garments design and production; Analysis of fashion and material trends.

UNIT V ORGANIZATION AND MANAGEMENT 10
Project feasibility reports for leather; Plant lay out, Costing and pricing for leather garments and garments. Analysis of international market trends for garments – Europe, USA and other markets. Social auditing of leather garments, occupational Health and Safety, ISO 9000 and 14000.

TOTAL : 45 PERIODS

OUTCOME:
The students would understand interdisciplinary nature of this field and appreciate the processes involved in leather garment fabrication

TEXTBOOKS:

REFERENCES:

FT6008 SEWING THREADS AND FANCY YARNS L T P C 3 0 0 3

OBJECTIVE:
• To develop comprehensive understanding of sewing threads and fancy yarns

UNIT I 9
Sewing thread – Introduction - Basic requirements and characteristics - Types of sewing thread – spun threads, core spun threads, filament threads; sewing thread production method; characteristics and application. Other sewing threads – tencel, acrylic, linen, elastic, soluble; embroidery threads.

UNIT II 15
Ticket number in sewing threads; testing of sewing threads – physical and chemical properties; Sewability of the thread, seam efficiency index, tensile properties, abrasion resistance, friction,
heat resistance, shrinkage, snarling tendency, fastness, mass evenness. Sewing performance –
control of missing stitches and seam puckering, factors affecting seam strength.

UNIT III  
Fancy yarn – Introduction background – structures and formation of fancy yarns: Marl, corkscrew,
Gimp, Boucle, snarl, loop, knop, strip, grandrelle, slub, nep, tape, chenille, metallic yarn –
Manufacturing techniques

UNIT IV  
Selection of sewing thread for different end uses, design and application of fancy yarns

OUTCOMES:
The students will have understand on
• Basic requirements and characteristics of sewing and fancy yarn manufacture and its
  applications
• Varieties of sewing threads, their modes of manufacture and the design implications that
  results from their use

TEXTBOOKS:
   Needles”, NITRA, 2006
2. Gong R. H and Wright R.M."Fancy yarns – Their manufacture and application", Woodhead

REFERENCES:
2. Carr H., "The Technology of Clothing Manufacture", Blackwell Publisher, UK, 2004
   2005.

FT6009  
COLOUR SCIENCE

OBJECTIVES:
• To provide an insight into the theoretical aspects of colour science.
• To make the student understand physical and physiological aspects of colour vision.
• To introduce student to instruments of colour measurement and evaluation of colour
  differences

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

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

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

UNIT IV  NUMERICAL COLOUR MATCHING  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, the CIE model for computer color matching and the calculation of colour recipes, non CIE models for colour matching, limitations of computer color matching.

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

TOTAL : 45 PERIODS

OUTCOME:
Upon completion of this course, the student would develop comprehensive knowledge on colour science physics, its measurement and evaluation.

TEXTBOOKS:

REFERENCES:

GE6084  HUMAN RIGHTS  L T P C
3 0 0 3

OBJECTIVES:
• To sensitize the Engineering students to various aspects of Human Rights.

UNIT I  9

UNIT II  9

UNIT III  9
Theories and perspectives of UN Laws – UN Agencies to monitor and compliance.

UNIT IV  9
Human Rights in India – Constitutional Provisions / Guarantees.

UNIT V  9
Human Rights of Disadvantaged People – Women, Children, Displaced persons and Disabled persons, including Aged and HIV Infected People. Implementation of Human
Rights – National and State Human Rights Commission – Judiciary – Role of NGO’s, Media, Educational Institutions, Social Movements.

TOTAL : 45 PERIODS

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

REFERENCES:

GE6075 PROFESSIONAL ETHICS IN ENGINEERING  
LT P C  
3 0 0 3

OBJECTIVES:
- To enable the students to create an awareness on Engineering Ethics and Human Values, to instill Moral and Social Values and Loyalty and to appreciate the rights of others.

UNIT I HUMAN VALUES  

UNIT II ENGINEERING ETHICS  

UNIT III ENGINEERING AS SOCIAL EXPERIMENTATION  
Engineering as Experimentation – Engineers as responsible Experimenters – Codes of Ethics – A Balanced Outlook on Law.

UNIT IV SAFETY, RESPONSIBILITIES AND RIGHTS  

UNIT V GLOBAL ISSUES  

TOTAL : 45 PERIODS

OUTCOME:
- Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society

TEXTBOOKS:
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, “Engineering Ethics”, Prentice Hall of India,
New Delhi, 2004.

REFERENCES:

Web sources:
1. www.onlineethics.org
2. www.nspe.org
3. www.globalethics.org
4. www.ethics.org

FT6010 BRAND MANAGEMENT

OBJECTIVE:
- To introduce students to 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 – meaning, creation, challenges; brand design – 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

TOTAL : 45 PERIODS

OUTCOME:
The students would have knowledge on consumer behaviour, brand identity and brand equity management

TEXTBOOKS:

REFERENCE:
OBJECTIVE:
- Study of this subject provides an understanding of the scope of an entrepreneur, key areas of development, financial assistance by the institutions, methods of taxation and tax benefits.

UNIT I  ENTREPRENEURSHIP

UNIT II  MOTIVATION
Major Motives Influencing an Entrepreneur – Achievement Motivation Training, self Rating, Business Game, Thematic Apperception Test – Stress management, Entrepreneurship Development Programs – Need, Objectives.

UNIT III  BUSINESS

UNIT IV  FINANCING AND ACCOUNTING

UNIT V  SUPPORT TO ENTREPRENEURS

TOTAL : 45 PERIODS

OUTCOME:
The students will have confidence and entrepreneurial skills essential for the successful launch and scaling-up of an enterprise

TEXT BOOKS:

REFERENCES:
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 Processes 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, Scenarios in the Indian context,
- Disaster damage assessment and management.

TEXTBOOKS:

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