

# ANNA UNIVERSITY, CHENNAI

## AFFILIATED INSTITUTIONS

### R - 2008

**B.TECH. TEXTILE TECHNOLOGY (FASHION TECHNOLOGY) /**

**B. TECH. FASHION TECHNOLOGY**

**II – VIII SEMESTERS CURRICULA AND SYLLABI**

#### SEMESTER II

(Common to all B.E. / B.Tech. Degree Programmes except B.E. – Marine Engineering)

| SL. No.                   | COURSE CODE | COURSE TITLE   | L | T | P | C |
|---------------------------|-------------|--|---|---|---|---|
| <b>THEORY</b>             |             |  |   |   |   |   |
| 1.                        | HS2161      | <u>Technical English – II*</u>   | 3 | 1 | 0 | 4 |
| 2.                        | MA2161      | <u>Mathematics – II*</u>   | 3 | 1 | 0 | 4 |
| 3.                        | PH2161      | <u>Engineering Physics – II*</u>   | 3 | 0 | 0 | 3 |
| 4.                        | CY2161      | <u>Engineering Chemistry – II*</u>   | 3 | 0 | 0 | 3 |
| 5. a                      | ME2151      | <u>Engineering Mechanics</u><br><b>(For non-circuit branches)</b>                              | 3 | 1 | 0 | 4 |
| 5. b                      | EE2151      | <u>Circuit Theory</u><br><b>(For branches under Electrical Faculty)</b>                        | 3 | 1 | 0 | 4 |
| 5. c                      | EC2151      | <u>Electric Circuits and Electron Devices</u><br><b>(For branches under I &amp; C Faculty)</b> | 3 | 1 | 0 | 4 |
| 6. a                      | GE2151      | <u>Basic Electrical &amp; Electronics Engineering</u><br><b>(For non-circuit branches)</b>     | 4 | 0 | 0 | 4 |
| 6. b                      | GE2152      | <u>Basic Civil &amp; Mechanical Engineering</u><br><b>(For circuit branches)</b>               | 4 | 0 | 0 | 4 |
| <b>PRACTICALS</b>         |             |  |   |   |   |   |
| 7.                        | GE2155      | <u>Computer Practice Laboratory-II*</u>  | 0 | 1 | 2 | 2 |
| 8.                        | GS2165      | <u>Physics &amp; Chemistry Laboratory - II*</u>  | 0 | 0 | 3 | 2 |
| 9. a                      | ME2155      | <u>Computer Aided Drafting and Modeling Laboratory</u><br><b>(For non-circuits branches)</b>   | 0 | 1 | 2 | 2 |
| 9. b                      | EE2155      | <u>Electrical Circuits Laboratory</u><br><b>(For branches under Electrical Faculty)</b>        | 0 | 0 | 3 | 2 |
| 9. c                      | EC2155      | <u>Circuits and Devices Laboratory</u><br><b>(For branches under I &amp; C Faculty)</b>        | 0 | 0 | 3 | 2 |
| <b>TOTAL : 28 CREDITS</b> |             |  |   |   |   |   |

|     |   |  |   |   |   |   |
|-----|---|--|---|---|---|---|
| 10. | - | English Language Laboratory <sup>+</sup> | 0 | 0 | 2 | - |
|-----|---|--|---|---|---|---|

## **A. CIRCUIT BRANCHES**

### **I Faculty of Electrical Engineering**

1. B.E. Electrical and Electronics Engineering
2. B.E. Electronics and Instrumentation Engineering
3. B.E. Instrumentation and Control Engineering

### **II Faculty of Information and Communication Engineering**

1. B.E. Computer Science and Engineering
2. B.E. Electronics and Communication Engineering
3. B.E. Bio Medical Engineering
4. B.Tech. Information Technology

## **B. NON – CIRCUIT BRANCHES**

### **I Faculty of Civil Engineering**

1. B.E. Civil Engineering

### **II Faculty of Mechanical Engineering**

1. B.E. Aeronautical Engineering
2. B.E. Automobile Engineering
3. B.E. Marine Engineering
4. B.E. Mechanical Engineering
5. B.E. Production Engineering

### **III Faculty of Technology**

1. B.Tech. Chemical Engineering
2. B.Tech. Biotechnology
3. B.Tech. Polymer Technology
4. B.Tech. Textile Technology
5. B.Tech. Textile Technology (Fashion Technology)
6. B.Tech. Petroleum Engineering
7. B.Tech. Plastics Technology

**SEMESTER III**

(Applicable to the students admitted from the Academic year 2008 – 2009 onwards)

| CODE NO.          | COURSE TITLE  | L         | T        | P        | C         |
|-------------------|---|-----------|----------|----------|-----------|
| <b>THEORY</b>     |   |           |          |          |           |
| MA 2211           | <u>Transforms and Partial Differential Equation</u> | 3         | 1        | 0        | 4         |
| GE 2021           | <u>Environmental Science &amp; Engineering</u>      | 3         | 0        | 0        | 3         |
| TT 2202           | <u>Mechanical Engineering</u>                       | 3         | 0        | 0        | 3         |
| TT 2201           | <u>Electrical Engineering</u>                       | 3         | 0        | 0        | 3         |
| FT 2201           | <u>Pattern Making</u>                               | 3         | 0        | 0        | 3         |
| FT 2202           | <u>Textile Science</u>                              | 3         | 0        | 0        | 3         |
| <b>PRACTICALS</b> |   |           |          |          |           |
| TT 2207           | <u>Electrical Engineering Lab</u>                   | 0         | 0        | 3        | 2         |
| TT 2208           | <u>Mechanical Engineering Lab</u>                   | 0         | 0        | 3        | 2         |
| FT 2207           | <u>Pattern making and grading Lab</u>               | 0         | 0        | 3        | 2         |
| <b>TOTAL</b>      |   | <b>18</b> | <b>1</b> | <b>9</b> | <b>25</b> |

**SEMESTER – IV**

(Applicable to the students admitted from the Academic year 2008 – 2009 onwards)

| CODE NO.          | COURSE TITLE  | L         | T        | P        | C         |
|-------------------|---|-----------|----------|----------|-----------|
| <b>THEORY</b>     |   |           |          |          |           |
| MA 2263           | <u>Probability and Statistics</u>                   | 3         | 1        | 0        | 4         |
| FT 2251           | <u>Garment Construction</u>                         | 3         | 0        | 0        | 3         |
| FT 2252           | <u>Fabric Manufacture</u>                           | 3         | 0        | 0        | 3         |
| FT 2253           | <u>Woven Fabric Structure &amp; Design</u>          | 3         | 0        | 0        | 3         |
| FT 2254           | <u>Garment Production Machinery and Equipment-I</u> | 3         | 0        | 0        | 3         |
| FT 2255           | <u>Dyeing, Printing &amp; Pollution Control</u>     | 3         | 0        | 0        | 3         |
| <b>PRACTICALS</b> |   |           |          |          |           |
| FT 2257           | <u>Basic Garment Construction Lab</u>               | 0         | 0        | 3        | 2         |
| FT 2258           | <u>Dyeing &amp; Printing Lab</u>                    | 0         | 0        | 3        | 2         |
| FT 2259           | <u>Textile CAD &amp; Fabric Structure Lab</u>       | 0         | 0        | 3        | 2         |
| <b>TOTAL</b>      |   | <b>18</b> | <b>1</b> | <b>9</b> | <b>25</b> |

**SEMESTER – V**

| CODE NO.          | COURSE TITLE  | L         | T        | P         | C         |
|-------------------|---|-----------|----------|-----------|-----------|
| <b>THEORY</b>     |   |           |          |           |           |
| GE 2025           | <u>Professional Ethics in Engineering</u>                       | 3         | 0        | 0         | 3         |
| FT 2301           | <u>Embroidery &amp; Surface Ornamentation</u>                   | 3         | 0        | 0         | 3         |
| FT 2302           | <u>Men's &amp; Children's Wear</u>                              | 3         | 0        | 0         | 3         |
| FT 2303           | <u>Women's wear and Lingerie</u>                                | 3         | 0        | 0         | 3         |
| FT 2304           | <u>Knitted Fabric Structure</u>                                 | 3         | 0        | 0         | 3         |
| FT 2305           | <u>Testing &amp; Quality Control of Textiles &amp; Apparels</u> | 3         | 0        | 0         | 3         |
| <b>PRACTICALS</b> |   |           |          |           |           |
| FT 2307           | <u>Testing &amp; Quality Control Lab</u>                        | 0         | 0        | 3         | 2         |
| FT 2308           | <u>Garment Construction Lab I</u>                               | 0         | 0        | 3         | 2         |
| GE 2321           | <u>Communication Skills Laboratory</u>                          | 0         | 0        | 4         | 2         |
| <b>TOTAL</b>      |   | <b>18</b> | <b>0</b> | <b>10</b> | <b>24</b> |

### SEMESTER – VI

| CODE NO.          | COURSE TITLE   | L         | T        | P        | C         |
|-------------------|--|-----------|----------|----------|-----------|
| <b>THEORY</b>     |  |           |          |          |           |
| TT 2071           | <u>Apparel Production and Control</u>                    | 3         | 0        | 0        | 3         |
| FT 2352           | <u>Advanced pattern making</u>                           | 3         | 0        | 0        | 3         |
| FT 2353           | <u>Garment Production Machinery &amp; Equipment - II</u> | 3         | 0        | 0        | 3         |
| FT 2354           | <u>Clothing Care</u>                                     | 3         | 0        | 0        | 3         |
|                   | Elective I   | 3         | 0        | 0        | 3         |
|                   | Elective II  | 3         | 0        | 0        | 3         |
| <b>PRACTICALS</b> |  |           |          |          |           |
| FT 2357           | <u>Computer Aided Garment Design Lab</u>                 | 0         | 0        | 3        | 2         |
| FT 2358           | <u>Garment Construction Lab II</u>                       | 0         | 0        | 3        | 2         |
| FT 2359           | <u>Design Collection</u>                                 | 0         | 0        | 3        | 2         |
|                   | <b>TOTAL</b>   | <b>18</b> | <b>0</b> | <b>9</b> | <b>24</b> |

### SEMESTER – VII

| CODE NO.          | COURSE TITLE  | L         | T        | P        | C         |
|-------------------|---|-----------|----------|----------|-----------|
| <b>THEORY</b>     |   |           |          |          |           |
| MG 2351           | <u>Principles of Management</u>                                       | 3         | 0        | 0        | 3         |
| FT 2401           | <u>Work study in apparel production</u>                               | 3         | 0        | 0        | 3         |
| TT 2082           | <u>Textile Costing</u>  | 3         | 0        | 0        | 3         |
| TT 2351           | <u>Quality assurance in fabric manufacture and garment production</u> | 3         | 0        | 0        | 3         |
| FT 2404           | <u>Computer application in apparel industry</u>                       | 3         | 0        | 0        | 3         |
|                   | Elective III  | 3         | 0        | 0        | 3         |
| <b>PRACTICALS</b> |   |           |          |          |           |
| FT 2407           | <u>Mini Project &amp; Design Collection</u>                           | 0         | 0        | 3        | 2         |
| FT 2408           | <u>Apparel Machinery Lab</u>  | 0         | 0        | 3        | 2         |
|                   | <b>TOTAL</b>  | <b>18</b> | <b>0</b> | <b>6</b> | <b>22</b> |

### SEMESTER VIII

| CODE NO.          | COURSE TITLE                    | L        | T        | P         | C         |
|-------------------|---------------------------------|----------|----------|-----------|-----------|
| <b>THEORY</b>     |                                 |          |          |           |           |
| GE 2022           | <u>Total Quality Management</u> | 3        | 0        | 0         | 3         |
|                   | Elective IV                     | 3        | 0        | 0         | 3         |
| <b>PRACTICALS</b> |                                 |          |          |           |           |
| FT 2451           | Project Work                    | 0        | 0        | 12        | 6         |
| FT 2452           | Comprehension                   | 0        | 0        | 2         | 1         |
|                   | <b>TOTAL</b>                    | <b>6</b> | <b>0</b> | <b>14</b> | <b>13</b> |

## LIST OF ELECTIVES

### ELECTIVE I

| CODE NO. | COURSE TITLE                        | L | T | P | C |
|----------|-------------------------------------|---|---|---|---|
| FT2021   | <u>Fashion Photography</u>          | 3 | 0 | 0 | 3 |
| FT2022   | <u>CAD in Fashion &amp; Textile</u> | 3 | 0 | 0 | 3 |
| FT2023   | <u>Management of Apparel Units</u>  | 3 | 0 | 0 | 3 |
| FT2024   | <u>Fashion Marketing</u>            | 3 | 0 | 0 | 3 |

### ELECTIVE II

| CODE NO. | COURSE TITLE   | L | T | P | C |
|----------|--|---|---|---|---|
| FT2025   | <u>Computer Aided Pattern Making (CAPM) for Men's and Women's Wear</u> | 3 | 0 | 0 | 3 |
| FT2026   | <u>Creativity, Innovation, and New Product Development</u>             | 3 | 0 | 0 | 3 |
| FT2027   | <u>Garment Finishing</u>   | 3 | 0 | 0 | 3 |
| FT2028   | <u>CAD/CAM for Apparel Products</u>                                    | 3 | 0 | 0 | 3 |
| FT2029   | <u>Apparel Merchandising and Marketing</u>                             | 3 | 0 | 0 | 3 |

### ELECTIVE III

| CODE NO. | COURSE TITLE  | L | T | P | C |
|----------|---|---|---|---|---|
| FT2031   | <u>Operational Research</u>                         | 3 | 0 | 0 | 3 |
| TT2041   | <u>Apparel Product Engineering and Plant Layout</u> | 3 | 0 | 0 | 3 |
| FT2033   | <u>Eco friendly Dyes and Chemicals</u>              | 3 | 0 | 0 | 3 |

### ELECTIVE IV

| CODE NO. | COURSE TITLE                | L | T | P | C |
|----------|-----------------------------|---|---|---|---|
| FT2035   | <u>Clothing Science</u>     | 3 | 0 | 0 | 3 |
| FT2036   | <u>Protective Garments</u>  | 3 | 0 | 0 | 3 |
| FT2037   | <u>Visual Merchandising</u> | 3 | 0 | 0 | 3 |

**AIM**

To encourage students to actively involve in participative learning of English and to help them acquire Communication Skills.

**OBJECTIVES**

- To help students develop listening skills for academic and professional purposes.
- To help students acquire the ability to speak effectively in English in real-life situations.
- To inculcate reading habit and to develop effective reading skills.
- To help students improve their active and passive vocabulary.
- To familiarize students with different rhetorical functions of scientific English.
- To enable students write letters and reports effectively in formal and business situations.

**UNIT I****12**

Technical Vocabulary - meanings in context, sequencing words, Articles- Prepositions, intensive reading& predicting content, Reading and interpretation, extended definitions, Process description

**Suggested activities:**

1. Exercises on word formation using the prefix 'self' - Gap filling with preposition.
2. Exercises - Using sequence words.
3. Reading comprehension exercise with questions based on inference – Reading headings
4. and predicting the content – Reading advertisements and interpretation.
5. Writing extended definitions – Writing descriptions of processes – Writing paragraphs based on discussions – Writing paragraphs describing the future.

**UNIT II****12**

Phrases / Structures indicating use / purpose – Adverbs-Skimming – Non-verbal communication - Listening – correlating verbal and non-verbal communication -Speaking in group discussions – Formal Letter writing – Writing analytical paragraphs.

**Suggested activities:**

1. Reading comprehension exercises with questions on overall content – Discussions analyzing stylistic features (creative and factual description) - Reading comprehension exercises with texts including graphic communication - Exercises in interpreting non-verbal communication.
2. Listening comprehension exercises to categorise data in tables.
3. Writing formal letters, quotations, clarification, complaint – Letter seeking permission for Industrial visits– Writing analytical paragraphs on different debatable issues.

**UNIT III****12**

Cause and effect expressions – Different grammatical forms of the same word - Speaking – stress and intonation, Group Discussions - Reading – Critical reading - Listening, - Writing – using connectives, report writing – types, structure, data collection, content, form, recommendations .

**Suggested activities:**

1. Exercises combining sentences using cause and effect expressions – Gap filling exercises using the appropriate tense forms – Making sentences using different grammatical forms of the same word. ( Eg: object –verb / object – noun )
2. Speaking exercises involving the use of stress and intonation – Group discussions– analysis of problems and offering solutions.
3. Reading comprehension exercises with critical questions, Multiple choice question.
4. Sequencing of jumbled sentences using connectives – Writing different types of reports like industrial accident report and survey report – Writing recommendations.

**UNIT IV****12**

Numerical adjectives – Oral instructions – Descriptive writing – Argumentative paragraphs – Letter of application - content, format (CV / Bio-data) - Instructions, imperative forms - Checklists, Yes/No question form – E-mail communication.

**Suggested Activities:**

1. Rewriting exercises using numerical adjectives.
2. Reading comprehension exercises with analytical questions on content – Evaluation of content.
3. Listening comprehension – entering information in tabular form, intensive listening exercise and completing the steps of a process.
4. Speaking - Role play – group discussions – Activities giving oral instructions.
5. Writing descriptions, expanding hints – Writing argumentative paragraphs – Writing formal letters – Writing letter of application with CV/Bio-data – Writing general and safety instructions – Preparing checklists – Writing e-mail messages.

**UNIT V****9**

Speaking - Discussion of Problems and solutions - Creative and critical thinking – Writing an essay, Writing a proposal.

**Suggested Activities:**

1. Case Studies on problems and solutions
2. Brain storming and discussion
3. Writing Critical essays
4. Writing short proposals of 2 pages for starting a project, solving problems, etc.
5. Writing advertisements.

**TOTAL: 60 PERIODS****TEXT BOOK**

1. Chapters 5 – 8. Department of Humanities & Social Sciences, Anna University, 'English for Engineers and Technologists' Combined Edition (Volumes 1 & 2), Chennai: Orient Longman Pvt. Ltd., 2006. Themes 5 – 8 (Technology, Communication, Environment, Industry)

**REFERENCES**

1. P. K. Dutt, G. Rajeevan and C.L.N Prakash, 'A Course in Communication Skills', Cambridge University Press, India 2007.
2. Krishna Mohan and Meera Banerjee, 'Developing Communication Skills', Macmillan India Ltd., (Reprinted 1994 – 2007).
3. Edgar Thorpe, Showick Thorpe, 'Objective English', Second Edition, Pearson Education, 2007.





## REFERENCES

1. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, (2007).
2. Glyn James, "Advanced Engineering Mathematics", 3<sup>rd</sup> Edition, Pearson Education, (2007).
3. Erwin Kreyszig, "Advanced Engineering Mathematics", 7<sup>th</sup> Edition, Wiley India, (2007).
4. Jain R.K and Iyengar S.R.K, "Advanced Engineering Mathematics", 3<sup>rd</sup> Edition, Narosa Publishing House Pvt. Ltd., (2007).

**PH2161**

**ENGINEERING PHYSICS – II**

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

### **UNIT I CONDUCTING MATERIALS**

**9**

Conductors – classical free electron theory of metals – Electrical and thermal conductivity – Wiedemann – Franz law – Lorentz number – Draw backs of classical theory – Quantum theory – Fermi distribution function – Effect of temperature on Fermi Function – Density of energy states – carrier concentration in metals.

### **UNIT II SEMICONDUCTING MATERIALS**

**9**

Intrinsic semiconductor – carrier concentration derivation – Fermi level – Variation of Fermi level with temperature – electrical conductivity – band gap determination – extrinsic semiconductors – carrier concentration derivation in n-type and p-type semiconductor – variation of Fermi level with temperature and impurity concentration – compound semiconductors – Hall effect – Determination of Hall coefficient – Applications.

### **UNIT III MAGNETIC AND SUPERCONDUCTING MATERIALS**

**9**

Origin of magnetic moment – Bohr magneton – Dia and para magnetism – Ferro magnetism – Domain theory – Hysteresis – soft and hard magnetic materials – anti – ferromagnetic materials – Ferrites – applications – magnetic recording and readout – storage of magnetic data – tapes, floppy and magnetic disc drives.  
Superconductivity : properties - Types of super conductors – BCS theory of superconductivity (Qualitative) - High T<sub>c</sub> superconductors – Applications of superconductors – SQUID, cryotron, magnetic levitation.

### **UNIT IV DIELECTRIC MATERIALS**

**9**

Electrical susceptibility – dielectric constant – electronic, ionic, orientational and space charge polarization – frequency and temperature dependence of polarisation – internal field – Clausius – Mosotti relation (derivation) – dielectric loss – dielectric breakdown – uses of dielectric materials (capacitor and transformer) – ferroelectricity and applications.

### **UNIT V MODERN ENGINEERING MATERIALS**

**9**

Metallic glasses: preparation, properties and applications.  
Shape memory alloys (SMA): Characteristics, properties of NiTi alloy, application, advantages and disadvantages of SMA  
Nanomaterials: synthesis – plasma arcing – chemical vapour deposition – sol-gels – electrodeposition – ball milling - properties of nanoparticles and applications.  
Carbon nanotubes: fabrication – arc method – pulsed laser deposition – chemical vapour deposition - structure – properties and applications.

**TEXT BOOKS**

1. Charles Kittel ' Introduction to Solid State Physics', John Wiley & sons, 7<sup>th</sup> edition, Singapore (2007)
2. Charles P. Poole and Frank J.Owenn, 'Introduction to Nanotechnology', Wiley India(2007) (for Unit V)

**REFERENCES**

1. Rajendran, V, and Marikani A, 'Materials science'Tata McGraw Hill publications, (2004) New delhi.
2. Jayakumar, S. 'Materials science', R.K. Publishers, Coimbatore, (2008).
3. Palanisamy P.K, 'Materials science', Scitech publications(India) Pvt. LTd., Chennai, second Edition(2007)
4. M. Arumugam, 'Materials Science' Anuradha publications, Kumbakonam, (2006).

**CY2161**

**ENGINEERING CHEMISTRY – II**

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

**AIM**

To impart a sound knowledge on the principles of chemistry involving the different application oriented topics required for all engineering branches.

**OBJECTIVES**

- The student should be conversant with the principles electrochemistry, electrochemical cells, emf and applications of emf measurements.
- Principles of corrosion control
- Chemistry of Fuels and combustion
- Industrial importance of Phase rule and alloys
- Analytical techniques and their importance.

**UNIT I ELECTROCHEMISTRY**

**9**

Electrochemical cells – reversible and irreversible cells – EMF – measurement of emf – Single electrode potential – Nernst equation (problem) – reference electrodes –Standard Hydrogen electrode -Calomel electrode – Ion selective electrode – glass electrode and measurement of pH – electrochemical series – significance – potentiometer titrations (redox -  $\text{Fe}^{2+}$  vs dichromate and precipitation –  $\text{Ag}^+$  vs  $\text{Cl}^-$  titrations) and conduct metric titrations (acid-base – HCl vs, NaOH) titrations,

**UNIT II CORROSION AND CORROSION CONTROL**

**9**

Chemical corrosion – Pilling – Bedworth rule – electrochemical corrosion – different types – galvanic corrosion – differential aeration corrosion – factors influencing corrosion – corrosion control – sacrificial anode and impressed cathodic current methods – corrosion inhibitors – protective coatings – paints – constituents and functions – metallic coatings – electroplating (Au) and electroless (Ni) plating.

**UNIT III FUELS AND COMBUSTION**

**9**

Calorific value – classification – Coal – proximate and ultimate analysis metallurgical coke – manufacture by Otto-Hoffmann method – Petroleum processing and fractions – cracking – catalytic cracking and methods-knocking – octane number and cetane number – synthetic petrol – Fischer Tropsch and Bergius processes – Gaseous fuels-

water gas, producer gas, CNG and LPG, Flue gas analysis – Orsat apparatus – theoretical air for combustion.

**UNIT IV PHASE RULE AND ALLOYS 9**

Statement and explanation of terms involved – one component system – water system – condensed phase rule – construction of phase diagram by thermal analysis – simple eutectic systems (lead-silver system only) – alloys – importance, ferrous alloys – nichrome and stainless steel – heat treatment of steel, non-ferrous alloys – brass and bronze.

**UNIT V ANALYTICAL TECHNIQUES 9**

Beer-Lambert's law (problem) – UV-visible spectroscopy and IR spectroscopy – principles – instrumentation (problem) (block diagram only) – estimation of iron by colorimetry – flame photometry – principle – instrumentation (block diagram only) – estimation of sodium by flame photometry – atomic absorption spectroscopy – principles – instrumentation (block diagram only) – estimation of nickel by atomic absorption spectroscopy.

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. P.C.Jain and Monica Jain, "Engineering Chemistry" Dhanpat Rai Pub, Co., New Delhi (2002).
2. S.S.Dara "A text book of Engineering Chemistry" S.Chand & Co.Ltd., New Delhi (2006).

**REFERENCES**

1. B.Sivasankar "Engineering Chemistry" Tata McGraw-Hill Pub.Co.Ltd, New Delhi (2008).
2. B.K.Sharma "Engineering Chemistry" Krishna Prakasan Media (P) Ltd., Meerut (2001).

**ME2151 ENGINEERING MECHANICS L T P C  
3 1 0 4**

**OBJECTIVE**

At the end of this course the student should be able to understand the vectorial and scalar representation of forces and moments, static equilibrium of particles and rigid bodies both in two dimensions and also in three dimensions. Further, he should understand the principle of work and energy. He should be able to comprehend the effect of friction on equilibrium. He should be able to understand the laws of motion, the kinematics of motion and the interrelationship. He should also be able to write the dynamic equilibrium equation. All these should be achieved both conceptually and through solved examples.

**UNIT I BASICS & STATICS OF PARTICLES 12**

Introduction – Units and Dimensions – Laws of Mechanics – Lame's theorem, Parallelogram and triangular Law of forces – Vectors – Vectorial representation of forces and moments – Vector operations: additions, subtraction, dot product, cross product – Coplanar Forces – Resolution and Composition of forces – Equilibrium of a particle – Forces in space – Equilibrium of a particle in space – Equivalent systems of forces – Principle of transmissibility – Single equivalent force.

**UNIT II EQUILIBRIUM OF RIGID BODIES 12**

Free body diagram – Types of supports and their reactions – requirements of 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 – Equilibrium of Rigid bodies in two dimensions – Equilibrium of Rigid bodies in three dimensions – Examples

**UNIT III PROPERTIES OF SURFACES AND SOLIDS 12**

Determination of Areas and Volumes – First moment of area and the Centroid of sections – Rectangle, circle, triangle from integration – T section, I section, - Angle section, Hollow section by using standard formula – second and product moments of plane area – Rectangle, triangle, circle from integration – T section, I section, Angle section, Hollow section by using standard formula – Parallel axis theorem and perpendicular axis theorem – Polar moment of inertia – Principal moments of inertia of plane areas – Principal axes of inertia – Mass moment of inertia – Derivation of mass moment of inertia for rectangular section, prism, sphere from first principle – Relation to area moments of inertia.

**UNIT IV DYNAMICS OF PARTICLES 12**

Displacements, Velocity and acceleration, their relationship – Relative motion – Curvilinear motion – Newton’s law – Work Energy Equation of particles – Impulse and Momentum – Impact of elastic bodies.

**UNIT V FRICTION AND ELEMENTS OF RIGID BODY DYNAMICS 12**

Frictional force – Laws of Coloumb friction – simple contact friction – Rolling resistance – Belt friction.

Translation and Rotation of Rigid Bodies – Velocity and acceleration – General Plane motion.

**TOTAL: 60 PERIODS**

**TEXT BOOK**

1. Beer, F.P and Johnson Jr. E.R. “Vector Mechanics for Engineers”, Vol. 1 Statics and Vol. 2 Dynamics, McGraw-Hill International Edition, (1997).

**REFERENCES**

1. Rajasekaran, S, Sankarasubramanian, G., “Fundamentals of Engineering Mechanics”, Vikas Publishing House Pvt. Ltd., (2000).
2. Hibbeller, R.C., “Engineering Mechanics”, Vol. 1 Statics, Vol. 2 Dynamics, Pearson Education Asia Pvt. Ltd., (2000).
3. Palanichamy, M.S., Nagam, S., “Engineering Mechanics – Statics & Dynamics”, Tata McGraw-Hill, (2001).
4. Irving H. Shames, “Engineering Mechanics – Statics and Dynamics”, IV Edition – Pearson Education Asia Pvt. Ltd., (2003).
5. Ashok Gupta, “Interactive Engineering Mechanics – Statics – A Virtual Tutor (CDROM)”, Pearson Education Asia Pvt., Ltd., (2002).

**EE2151**

**CIRCUIT THEORY**

**L T P C**

(Common to EEE, EIE and ICE Branches)

**3 1 0 4**

**UNIT I BASIC CIRCUITS ANALYSIS**

**12**

Ohm's Law – Kirchoffs laws – DC and AC Circuits – Resistors in series and parallel circuits – Mesh current and node voltage method of analysis for D.C and A.C. circuits.

**UNIT II NETWORK REDUCTION AND NETWORK THEOREMS FOR DC AND AC CIRCUITS: 12**

Network reduction: voltage and current division, source transformation – star delta conversion.

Thevenins and Novton & Theorem – Superposition Theorem – Maximum power transfer theorem – Reciprocity Theorem.

**UNIT III RESONANCE AND COUPLED CIRCUITS 12**

Series and paralled resonance – their frequency response – Quality factor and Bandwidth - Self and mutual inductance – Coefficient of coupling – Tuned circuits – Single tuned circuits.

**UNIT IV TRANSIENT RESPONSE FOR DC CIRCUITS 12**

Transient response of RL, RC and RLC Circuits using Laplace transform for DC input and A.C. with sinusoidal input.

**UNIT V ANALYSING THREE PHASE CIRCUITS 12**

Three phase balanced / unbalanced voltage sources – analysis of three phase 3-wire and 4-wire circuits with star and delta connected loads, balanced & un balanced – phasor diagram of voltages and currents – power and power factor measurements in three phase circuits.

**TOTAL : 60 PERIODS**

**TEXT BOOKS**

1. William H. Hayt Jr, Jack E. Kemmerly and Steven M. Durbin, "Engineering Circuits Analysis", Tata McGraw Hill publishers, 6<sup>th</sup> edition, New Delhi, (2002).
2. Sudhakar A and Shyam Mohan SP, "Circuits and Network Analysis and Synthesis", Tata McGraw Hill, (2007).

**REFERENCES**

1. Paranjothi SR, "Electric Circuits Analysis," New Age International Ltd., New Delhi, (1996).
2. Joseph A. Edminister, Mahmood Nahri, "Electric circuits", Schaum's series, Tata McGraw-Hill, New Delhi (2001).
3. Chakrabati A, "Circuits Theory (Analysis and synthesis), Dhanpath Rai & Sons, New Delhi, (1999).
4. Charles K. Alexander, Mathew N.O. Sadik, "Fundamentals of Electric Circuits", Second Edition, McGraw Hill, (2003).

**EC2151 ELECTRIC CIRCUITS AND ELECTRON DEVICES L T P C**  
(For ECE, CSE, IT and Biomedical Engg. Branches) **3 1 0 4**

**UNIT I CIRCUIT ANALYSIS TECHNIQUES 12**

Kirchoff's current and voltage laws – series and parallel connection of independent sources – R, L and C – Network Theorems – Thevenin, Superposition, Norton, Maximum power transfer and duality – Star-delta conversion.

**UNIT II TRANSIENT RESONANCE IN RLC CIRCUITS 12**

Basic RL, RC and RLC circuits and their responses to pulse and sinusoidal inputs – frequency response – Parallel and series resonances – Q factor – single tuned and double tuned circuits.

**UNIT III SEMICONDUCTOR DIODES 12**

Review of intrinsic & extrinsic semiconductors – Theory of PN junction diode – Energy band structure – current equation – space charge and diffusion capacitances – effect of temperature and breakdown mechanism – Zener diode and its characteristics.

**UNIT IV TRANSISTORS 12**

Principle of operation of PNP and NPN transistors – study of CE, CB and CC configurations and comparison of their characteristics – Breakdown in transistors – operation and comparison of N-Channel and P-Channel JFET – drain current equation – MOSFET – Enhancement and depletion types – structure and operation – comparison of BJT with MOSFET – thermal effect on MOSFET.

**UNIT V SPECIAL SEMICONDUCTOR DEVICES (Qualitative Treatment only) 12**

Tunnel diodes – PIN diode, varactor diode – SCR characteristics and two transistor equivalent model – UJT – Diac and Triac – Laser, CCD, Photodiode, Phototransistor, Photoconductive and Photovoltaic cells – LED, LCD.

**TOTAL : 60 PERIODS**

**TEXT BOOKS**

1. Joseph A. Edminister, Mahmood, Nahri, "Electric Circuits" – Shaum series, Tata McGraw Hill, (2001)
2. S. Salivahanan, N. Suresh kumar and A. Vallavanraj, "Electronic Devices and Circuits", Tata McGraw Hill, 2<sup>nd</sup> Edition, (2008).
3. David A. Bell, "Electronic Devices and Circuits", Oxford University Press, 5<sup>th</sup> Edition, (2008).

**REFERENCES**

1. Robert T. Paynter, "Introducing Electronics Devices and Circuits", Pearson Education, 7<sup>th</sup> Edition, (2006).
2. William H. Hayt, J.V. Jack, E. Kemmebly and Steven M. Durbin, "Engineering Circuit Analysis", Tata McGraw Hill, 6<sup>th</sup> Edition, 2002.
3. J. Millman & Halkins, Satyabranta Jit, "Electronic Devices & Circuits", Tata McGraw Hill, 2<sup>nd</sup> Edition, 2008.

**GE2151 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING L T P C**  
(Common to branches under Civil, Mechanical and Technology faculty) **3 0 0 3**

**UNIT I ELECTRICAL CIRCUITS & MEASUREMENTS 12**

Ohm's Law – Kirchoff's Laws – Steady State Solution of DC Circuits – Introduction to AC Circuits – Waveforms and RMS Value – Power and Power factor – Single Phase and Three Phase Balanced Circuits.

Operating Principles of Moving Coil and Moving Iron Instruments (Ammeters and Voltmeters), Dynamometer type Watt meters and Energy meters.

**UNIT II ELECTRICAL MECHANICS 12**

Construction, Principle of Operation, Basic Equations and Applications of DC Generators, DC Motors, Single Phase Transformer, single phase induction Motor.

**UNIT III SEMICONDUCTOR DEVICES AND APPLICATIONS 12**

Characteristics of PN Junction Diode – Zener Effect – Zener Diode and its Characteristics – Half wave and Full wave Rectifiers – Voltage Regulation.

Bipolar Junction Transistor – CB, CE, CC Configurations and Characteristics – Elementary Treatment of Small Signal Amplifier.

**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**

Types of Signals: Analog and Digital Signals – Modulation and Demodulation: Principles of Amplitude and Frequency Modulations.

Communication Systems: Radio, TV, Fax, Microwave, Satellite and Optical Fibre (Block Diagram Approach only).

**TOTAL : 60 PERIODS**

**TEXT BOOKS**

1. V.N. Mittle "Basic Electrical Engineering", Tata McGraw Hill Edition, New Delhi, 1990.
2. R.S. Sedha, "Applied Electronics" S. Chand & Co., 2006.

**REFERENCES**

1. Muthusubramanian R, Salivahanan S and Muraleedharan K A, "Basic Electrical, Electronics and Computer Engineering", Tata McGraw Hill, Second Edition, (2006).
2. Nagsarkar T K and Sukhija M S, "Basics of Electrical Engineering", Oxford press (2005).
3. Mehta V K, "Principles of Electronics", S.Chand & Company Ltd, (1994).
4. Mahmood Nahvi and Joseph A. Edminister, "Electric Circuits", Schaum' Outline Series, McGraw Hill, (2002).
5. Premkumar N, "Basic Electrical Engineering", Anuradha Publishers, (2003).

**GE2152 BASIC CIVIL & MECHANICAL ENGINEERING L T P C**  
(Common to branches under Electrical and I & C Faculty) **4 0 0 4**

**A – CIVIL ENGINEERING**

**UNIT I SURVEYING AND CIVIL ENGINEERING MATERIALS 15**

**Surveying:** Objects – types – classification – principles – measurements of distances – angles – leveling – determination of areas – illustrative examples.

**Civil Engineering Materials:** Bricks – stones – sand – cement – concrete – steel sections.

**UNIT II BUILDING COMPONENTS AND STRUCTURES 15**

**Foundations:** Types, Bearing capacity – Requirement of good foundations.

**Superstructure:** Brick masonry – stone masonry – beams – columns – lintels – roofing – flooring – plastering – Mechanics – Internal and external forces – stress – strain – elasticity – Types of Bridges and Dams – Basics of Interior Design and Landscaping.

**TOTAL: 30 PERIODS**

**B – MECHANICAL ENGINEERING**

**UNIT III POWER PLANT ENGINEERING 10**

Introduction, Classification of Power Plants – Working principle of steam, Gas, Diesel, Hydro-electric and Nuclear Power plants – Merits and Demerits – Pumps and turbines – working principle of Reciprocating pumps (single acting and double acting) – Centrifugal Pump.

**UNIT IV I C ENGINES 10**

Internal combustion engines as automobile power plant – Working principle of Petrol and Diesel Engines – Four stroke and two stroke cycles – Comparison of four stroke and two stroke engines – Boiler as a power plant.

**UNIT V REFRIGERATION AND AIR CONDITIONING SYSTEM 10**

Terminology of Refrigeration and Air Conditioning. Principle of vapour compression and absorption system – Layout of typical domestic refrigerator – Window and Split type room Air conditioner.

**TOTAL: 30 PERIODS**

**REFERENCES:**

1. Shanmugam G and Palanichamy M S, “Basic Civil and Mechanical Engineering”, Tata McGraw Hill Publishing Co., New Delhi, (1996).
2. Ramamrutham. S, “Basic Civil Engineering”, Dhanpat Rai Publishing Co. (P) Ltd. (1999).
3. Seetharaman S. “Basic Civil Engineering”, Anuradha Agencies, (2005).
4. Venugopal K and Prahu Raja V, “Basic Mechanical Engineering”, Anuradha Publishers, Kumbakonam, (2000).
5. Shantha Kumar S R J., “Basic Mechanical Engineering”, Hi-tech Publications, Mayiladuthurai, (2000).

**GE2155 COMPUTER PRACTICE LABORATORY – II L T P C  
0 1 2 2**

**LIST OF EXPERIMENTS**

**1. UNIX COMMANDS 15**

Study of Unix OS - Basic Shell Commands - Unix Editor

**2. SHELL PROGRAMMING 15**

Simple Shell program - Conditional Statements - Testing and Loops

**3. C PROGRAMMING ON UNIX 15**



**HARDWARE / SOFTWARE REQUIREMENTS FOR A BATCH OF 30 STUDENTS**

**Hardware**

- . 1 UNIX Clone Server
- . 33 Nodes (thin client or PCs)
- . Printer – 3 Nos.

**Software**

- . OS – UNIX Clone (33 user license or License free Linux)
- . Compiler - C

**GS2165**

**PHYSICS LABORATORY – II**

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

**LIST OF EXPERIMENTS**

1. Determination of Young's modulus of the material – non uniform bending.
2. Determination of Band Gap of a semiconductor material.
3. Determination of specific resistance of a given coil of wire – Carey Foster Bridge.
4. Determination of viscosity of liquid – Poiseuille's method.
5. Spectrometer dispersive power of a prism.
6. Determination of Young's modulus of the material – uniform bending.
7. Torsional pendulum – Determination of rigidity modulus.

- **A minimum of FIVE experiments shall be offered.**
- **Laboratory classes on alternate weeks for Physics and Chemistry.**
- **The lab examinations will be held only in the second semester.**

**GS2165**

**CHEMISTRY LABORATORY – II**

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

**LIST OF EXPERIMENTS**

1. Conduct metric titration (Simple acid base)
2. Conduct metric titration (Mixture of weak and strong acids)
3. Conduct metric titration using  $\text{BaCl}_2$  vs  $\text{Na}_2\text{SO}_4$
4. Potentiometric Titration ( $\text{Fe}^{2+}$  /  $\text{KMnO}_4$  or  $\text{K}_2\text{Cr}_2\text{O}_7$ )
5. PH titration (acid & base)
6. Determination of water of crystallization of a crystalline salt (Copper sulphate)
7. Estimation of Ferric iron by spectrophotometry.

- **A minimum of FIVE experiments shall be offered.**

- **Laboratory classes on alternate weeks for Physics and Chemistry.**
- **The lab examinations will be held only in the second semester.**

**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,
9. Drawing isometric projection of simple objects.
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.**

**List of Equipments for a batch of 30 students:**

1. Pentium IV computer or better hardware, with suitable graphics facility -30 No.
2. Licensed software for Drafting and Modeling. – 30 Licenses
3. Laser Printer or Plotter to print / plot drawings – 2 No.

**EE2155 ELECTRICAL CIRCUIT LABORATORY L T P C**  
**(Common to EEE, EIE and ICE) 0 0 3 2**

**LIST OF EXPERIMENTS**

1. Verification of ohm's laws and kirchoff's laws.
2. Verification of Thevemin's and Norton's Theorem
3. Verification of superposition Theorem
4. Verification of maximum power transfer theorem.
5. Verification of reciprocity theorem
6. Measurement of self inductance of a coil
7. Verification of mesh and nodal analysis.
8. Transient response of RL and RC circuits for DC input.
9. Frequency response of series and parallel resonance circuits.
10. Frequency response of single tuned coupled circuits.

**TOTAL: 45 PERIODS**

1. Verification of KVL and KCL
2. Verification of Thevenin and Norton Theorems.
3. Verification of superposition Theorem.
4. Verification of Maximum power transfer and reciprocity theorems.
5. Frequency response of series and parallel resonance circuits.
6. Characteristics of PN and Zener diode
7. Characteristics of CE configuration
8. Characteristics of CB configuration
9. Characteristics of UJT and SCR
10. Characteristics of JFET and MOSFET
11. Characteristics of Diac and Triac.
12. Characteristics of Photodiode and Phototransistor.

**TOTAL: 45 PERIODS**

**ENGLISH LANGUAGE LABORATORY (Optional)**

**L T P C**

**0 0 2 -**

**1. Listening:**

**5**

Listening & answering questions – gap filling – Listening and Note taking- Listening to telephone conversations

**2. Speaking:**

**5**

Pronouncing words & sentences correctly – word stress – Conversation practice.

**Classroom Session**

**20**

1. Speaking: Introducing oneself, Introducing others, Role play, Debate- Presentations: Body language, gestures, postures. Group Discussions etc

2. Goal setting – interviews – stress time management – situational reasons Evaluation

(1) Lab Session – 40 marks

Listening – 10 marks

Speaking – 10 marks

Reading – 10 marks

Writing – 10 marks

(2) Classroom Session – 60 marks

Role play activities giving real life context – 30 marks

Presentation – 30 marks

Note on Evaluation

1. Examples for role play situations:
  - a. Marketing engineer convincing a customer to buy his product.
  - b. Telephone conversation – Fixing an official appointment / Enquiry on availability of flight or train tickets / placing an order. etc.
2. Presentations could be just a Minute (JAM activity) or an Extempore on simple topics or visuals could be provided and students could be asked to talk about it.

#### REFERENCES:

1. Hartley, Peter, Group Communication, London: Routledge, (2004).
2. Doff, Adrian and Christopher Jones, Language in Use – (Intermediate level), Cambridge University Press, (1994).
3. Gammidge, Mick, Speaking Extra – A resource book of multi-level skills activities , Cambridge University Press, (2004).
4. Craven, Miles, Listening Extra - A resource book of multi-level skills activities, Cambridge, Cambridge University Press, (2004).
5. Naterop, Jean & Rod Revell, Telephoning in English, Cambridge University Press, (1987).

#### LAB REQUIREMENTS

1. Teacher – Console and systems for students
2. English Language Lab Software
3. Tape Recorders.

**MA2211 TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS** **L T P C**  
**3 1 0 4**

**(Common to all branches of BE / B.Tech Programmes)**

#### OBJECTIVES

The course objective is to develop the skills of the students in the areas of Transforms and Partial Differential Equations. This will be necessary for their effective studies in a large number of engineering subjects like heat conduction, communication systems, electro-optics and electromagnetic theory. The course will also serve as a prerequisite for post graduate and specialized studies and research.

#### **UNIT I           FOURIER SERIES** **9 + 3**

Dirichlet's conditions – General Fourier series – Odd and even functions – Half range sine series – Half range cosine series – Complex form of Fourier Series – Parseval's identity – Harmonic Analysis.

#### **UNIT II           FOURIER TRANSFORMS** **9 + 3**

Fourier integral theorem (without proof) – Fourier transform pair – Sine and Cosine transforms – Properties – Transforms of simple functions – Convolution theorem – Parseval's identity.

#### **UNIT III           PARTIAL DIFFERENTIAL EQUATIONS** **9 + 3**





## REFERENCES

1. Bharucha Erach, "The Biodiversity of India", Mapin Publishing Pvt. Ltd., Ahmedabad India.
2. Trivedi R.K., "Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards", Vol. I and II, Enviro Media.
3. Cunningham, W.P.Cooper, T.H.Gorhani, "Environmental Encyclopedia", Jaico Publ., House, Mumbai, 2001.
4. Wager K.D. "Environmental Management", W.B. Saunders Co., Philadelphia, USA, 1998.
5. Townsend C., Harper J and Michael Begon, "Essentials of Ecology", Blackwell Science.
6. Trivedi R.K. and P.K. Goel, "Introduction to Air Pollution", Techno-Science Publications.

TT2202

MECHANICAL ENGINEERING

L T P C  
3 0 0 3

(Common to Fashion Technology & Textile Technology)

### AIM

To introduce the Mechanical Engineering Fundamentals to the Petroleum Engineering Students.

### OBJECTIVES

Students gain knowledge in the application of Mechanical and thermodynamics principles in the design and operation of Equipments and Machineries of Petroleum Industries.

### UNIT I LAWS OF THERMODYNAMICS 10

Basic concepts and hints; Zeroth law; First Law of Thermodynamics – Statement and application; Steady flow energy equation; Second law of Thermodynamics—Statement; Limitations Heat Engine; Heat Pump, Available energy, Kelvin—Plank statement and Clausius statement; Equivalence entropy; Reversibility: Entropy charts; Third law of Thermodynamics—Statement.

### UNIT II HEATING AND EXPANSION OF GASES : 5

Expressions for; work done; Internal energy, Hyperbolic and polytropic processes; Free expansion and Throttling.

### UNIT III AIR STANDARD EFFICIENCY 5

Carnot cycle; Stirlings Cycle: Joule Cycle; Otto Cycle; Diesel Cycle; Dual combustion Cycle.

### UNIT IV I.C. ENGINES 4

Engine nomenclature and classifications; SI Engine: CI Engine; Four Stroke cycle?; Two stroke cycle; Performance of I.C. Engine; Brake thermal efficiency; Indicated Thermal Efficiency, Specific fuel consumption.

### UNIT V STEAM AND ITS PROPERTIES 4

Properties of steam; Dryness fraction; latent heat; Total heat of wet steam; Superheated steam. Use of steam tables; volume of wet steam; Volume of superheated steam; External work of evaporation; Internal energy; Entropy of vapour, Expansion of vapour, Rankine cycle; Modified Rankine cycle.



|  |                                   |          |
|--|-----------------------------------|----------|
| <b>UNIT VI</b>   | <b>STEAM ENGINES AND TURBINES</b> | <b>3</b> |
| Hypothetical indicator diagram of steam engine; Working of a simple steam engine; steam turbines—Impulse and Reaction types—Principles of operation. |                                   |          |
| <b>UNIT VII</b>  | <b>SIMPLE MECHANISM</b>           | <b>3</b> |
| Kinematic Link, Kinematic Pair Kinematic Chain; Slider Crank mechanism and inversions; Double slider crank mechanism and inversions.                 |                                   |          |
| <b>UNIT VIII</b>   | <b>FLY WHEEL</b>                  | <b>4</b> |
| Turning moment Diagram; Fluctuation of Energy; Design of fly wheel.  |                                   |          |
| <b>UNIT IX</b>   | <b>DRIVES</b>                     | <b>5</b> |
| Belt and rope drives; Velocity ratio; slip; Ratio of tensions; Length of belt; Maximum HP; simple compound and Epicyclic gear trains.                |                                   |          |
| <b>UNIT X</b>  | <b>BALANCING</b>                  | <b>2</b> |
| Balancing of rotating masses in same plane; Balancing of masses rotating in different planes.  |                                   |          |

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Smith, "Chemical Thermodynamics", Reinhold Publishing Co., 1977.
2. Bhaskaran, K.A., and Venkatesh, A., "Engineering Thermodynamics", Tata McGraw-Hill, 1973.

**REFERENCES**

1. A.Pandya and Shah, "Theory of Machines", Charatakar Publisheres, 1975.
2. NAG, P.E., "Engineering Thermodynamics", II Edition, Tata McGraw-Hill Publishing Co., Ltd., 1995.

**TT2201** **ELECTRICAL ENGINEERING** **L T P C**  
**3 0 0 3**  
**(Common to Fashion Technology & Textile Technology)**

**AIM**

To introduce the principles of Electrical Engineering and the concepts of DC and AC machines.

**OBJECTIVES**

After the completion of this course, Students gain knowledge in fundamentals of Electrical Engineering and the operational and design aspects of DC and AC motors and drives.

**UNIT I** **9**  
SI units law, series, and parallel circuits, Kirchhoffs laws, Mechanical, Star-delta transformation – magnetic circuits – force on a current carrying conductor – electromagnetic induction, Faraday's Law, Lenz's law – effects of hystresis & eddy currents – Self and mutual inductances.

**UNIT II** **9**  
Generation of an alternating emf – average and rms values of alternating quantity – representation of alternating quantities by phasors – single phase circuits – resonance – three phase balanced systems – single and three phase power calculations.

**UNIT III** **9**  
Principle of operation of DC machines - emf equation – types of generators – Magnetization and Load characteristics of DC generators – types and characteristics of DC motors – torque equation – DC motor starters (three point) – Efficiency calculation and Swinburne's test O Speed control.

**UNIT IV** **9**  
Construction and principle of operation of single phase transformer – emf equation O.C. & S.C. tests – efficiency and regulation – 3F Transformers, Transmission and distribution – principle and operation of three phase induction motors – types – slip torque characteristics – principle and operation of alternators – O.C. & S.C. tests – regulations by synchronous impedance method.

**UNIT V** **9**  
Basic principles of indicating instruments – moving coil and moving iron instruments – dynamometer type wattmeters – induction types energy meter – measurement of single and three phase power.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Electrical Engineering Fundamentals / Del Toro 2<sup>nd</sup> Edition / Prentice Hall Publishers.
2. Fundamental of Electrical Engineering / Ashfaq Husain, 2<sup>nd</sup> edition / Dhanpat Rai & Co.

**REFERENCES**

1. Electrical technology – Edward Hughes.
2. Introduction to electrical Engineering – Naidu & Kamakshaiah
3. Electrical Technology – Vincent Del toro
4. Theory and Problems of Basic Electrical Engineering / D.P.Kothari & I.J. Nagrath, PHI Publishers, 1998.
5. Basic Electrical Engineering / V.N.Mittle / TMH 1998.

**FT 2201**

**PATTERN MAKING**

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

**AIM**

To impart knowledge on human body measurement and creation of pattern for costumes.

**OBJECTIVES**

- To teach the students the science of measuring human sizes and creating a pattern from the measurements.
- To develop commercial pattern and grading of various sizes from the basic pattern

**UNIT I** **9** **BASIC PATTERN MAKING**

Measurement Taking – Size chart and Measuring of Sizes. Definition of various garments parts & positions. Methods : Bespoke method & Industrial method ( Using Blocks ) – Basic block construction – Block preparation & correction.

**UNIT II DRAFTING 9**

Basic principles & methodologies used to draft standard size block patterns for men, women & kids wear- viz., shirts, pants, skirts, blouses, jackets, dresses etc.

**UNIT III DRAFTING OF SLEEVE & COLLAR 9**

Construction of sleeve block – crown height and its relationship with the fit of garment. Introduction to silhouettes of sleeves. Sleeve variation – cap, regular shirt sleeve, Bishop, Leg's o mutton, Puff sleeve. Cuffs & sleeves opening, sleeve plackets. Collars: Set-in collars and collar variations – band collars, peter pan, sailor, gents shirt collar – One piece and two piece collar, convertible collar.

**UNIT IV DART MANIPULATION 9**

Pattern making by manipulation of dart – and advance dart manipulation. Manipulation as seen through existing suppressions points (Bust points), away from suppression points, as gathers or tucks, as multiple darts. Methods: Slash & Spread, Pivot, difference between permanent pattern (Draft) Working patterns & Production patterns. Importance of drill hole marks in the darts; seam allowances and its importance Importance of notches: Balances marks & grain lines.

**UNIT V GRADING 9**

Principles of Grading – Master and Basic Grades – Basic Back Grades, Basic Front Grading, Basic Sleeve Grading, Basic Collar Grading, Basic Facing Grading. Trousers Grading, Jacket Grading, Shirt Grading, Grading Men's Waist Coat – Size Chart. Displacement of Bust Dart to Waist line – Side seam, arm hole – Neck arc Front edge, Women's Sizing Chart, Selecting a Grading System, Multi Track Grading. A Simplified System.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Gerry Cooklin "Introduction to Clothing Manufacture", Blackwell Scientific Publications SP 1990.
2. Gerry Cooklin "Master Patterns & Grading for Women's Outsize", Blackwell Scientific Publications (1995) ISBN: 0 – 632- 03915 – 9.

**REFERENCES**

1. Gerry Cooklin "Master Patterns & Grading for Men's Outsize", Blackwell Scientific Publications 1992.
2. Gillian Holman - Pattern Cutting Made Easy, Blackwell Scientific Publications 1997. ISBN: 0- 7134 – 8093- 9.
3. Natalie Bray "More Dress Pattern Designing" Blackwell Scientific Publications 1986 ISBN: 0-632-01883- 6.

**FT 2202**

**TEXTILE SCIENCE**

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

**AIM**

To impart Knowledge on Textile Fibre Science.

**OBJECTIVES**

The students should acquire Knowledge on Cultivation, Production. Physical & Chemical Properties and Identification methods of natural and synthetic fibres.

**UNIT I**

**9**

Definitions – Fibre, Textile fibre, Staple, Filament, Yarn, Thread. Properties of Textile Fibre – Physical, chemical Biological, Thermal properties – Classification of Textile Fibers – Definition – Moisture Regain, Moisture Content, Absolute Humidity, Relative Humidity.

**UNIT II** **9**  
Production & Cultivation of Natural Fibers, Cotton, Silk, Wool, Jute.

**UNIT III** **9**  
Production sequence of Man Made Fibers: Viscose Rayon, Acetate Rayon, Cuprammonium Rayon – Production Sequence of Synthetic Fibers: Polyester, Nylon, Acrylic.

**UNIT IV** **9**  
Production Sequence of Specialty fibers: Elastometric Fibers – Production Sequence of Inorganic Fibers : Glass Fibre, Metallic Fibre. Physical and Chemical Properties.

**UNIT V** **9**  
Identification of Textile Fibers – Microscope Test Chemical Test, Burning Test, Feeling Test & Breaking Test.

**TOTAL : 45 PERIODS**

**TEXT BOOK**

1. H.V.Srinivasa moorthy, “Introduction to Textile Fibres”, The Textile Association India, 1993.
2. Fibre to Fabric By Corbman.

**REFERENCES**

1. Advances in Fibre Science “ The Textile Institute, UK 1992 Mukhopadhyay S.K.

**TT2207**

**ELECTRICAL ENGINEERING LAB**

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

(Common to Fashion Technology & Textile Technology)

**AIM**

To introduce the Electrical Engineering and the concepts of DC and AC machines

**OBJECTIVES**

After the completion of this course, students, gain knowledge in fundamentals of Electrical Engineering and the operational and design aspects of DC and AC motors and drives.

**LIST OF EXPERIMENTS**

1. Open circuit characteristics of D.C. shunt generator.
2. Load characteristics of D.C. shunt generator
3. Load characteristics of D.C. compound generator
4. Load test on D.C. shunt motor
5. Study of D.C. motor starters
6. O.C. and S.C. tests on single phase transformer
7. Load test on single phase transformer
8. Load test on 3 - phase squirrel cage induction motor
9. Study of 3 - phase induction motor starters

10. Load test on 3 - phase slip ring induction motor
11. O.C. and S.C. tests on 3 - phase alternator
12. Synchronization and V-curves of alternator

**TOTAL : 45 PERIODS**

**LIST OF EQUIPMENTS**

1. D.C. shunt generator.
2. D.C. shunt generator
3. Compound generator
4. D.C. shunt motor
5. D.C. motor starters
6. Single phase transformer
7. 3 - phase squirrel cage induction motor
8. 3 - phase induction motor starters
9. 3 - phase slip ring induction motor
10. 3 - phase alternator
11. Alternator

**TT2208**

**MECHANICAL ENGINEERING LAB**

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

(Common to Fashion Technology & Textile Technology)

**AIM**

To introduce the Mechanical Engineering fundamentals to the petroleum engineering students.

**OBJECTIVES**

Students gain knowledge in the applications of Mechanical and Thermodynamics principles in the design and operation of equipments and machineries of petroleum industries.

**LIST OF EXPERIMENTS**

1. Heat balance test on Diesel engine
2. Mechanical load test on petrol engine
3. Morse test on multi cyliner petrol engine
4. volumetric efficiency on Diesel engine
5. Volumetric efficiency on two state reciprocating compressor
6. COP in compression refrigeration cycle
7. Test on Air conditioning system
8. Viscosity Index, Flash and Fire point of Lubricant
9. Valve timing diagram in Diesel engine
10. Port timing diagram

**LIST OF EQUIPMENTS**

1. Diesel Alternator Set
2. Diesel Engines
3. Petrol Engines
4. Multi Cylinder Petrol engine
5. Two stroke Reciprocating Compressor
6. Compression Refrigeration Cycle
7. Air Conditioning System

8. Viscosity, Flash and Fire point apparatus
9. Stream power plant
10. Two stroke engines
11. Bomb calorimeter
12. Orsat apparatus
13. Gas calorimeter

**FT2207          PATTERN MAKING AND GRADING LAB**

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

**AIM**

To impart knowledge on human body measurement creation of pattern for costumes.

**OBJECTIVES**

- To teach the students science of measuring human sizes and creating a pattern from the measurements.
  - To develop commercial pattern and grading of various sizes from the base pattern.
1. Developing pattern & Grading for Children’s wear
    - i. Baba suit
    - ii. Rompers
    - iii. Round neck T-Shirt
    - iv. Baby frock
  2. Developing pattern & Grading for Ladies wear
    - i. Salwar Kameez
    - ii. Blouses
    - iii. Skirt & Top
    - iv. Brassier & Panties
    - v. Nighty
  3. Developing Pattern & Grading for Men’s Wear
    - i. Men’s Shorts
    - ii. Men’s Formal Shirt
    - iii. Men’s Formal Trousers
    - iv. Jeans

**Pattern Making and Grading Lab**

**Requirements of Equipments (for a batch of 30 students)**

1. **Cork Top Tables** : 15
2. **Dummies**

|        |   |                           |    |
|--------|---|---------------------------|----|
| Male   | : | 38”Chest half             | -1 |
| Male   | : | 42” chest full            | -1 |
| Male   | : | 44” chest Half            | -1 |
| Male   | : | 44” chest full with hand  | -1 |
| Female | : | 32.5” bust half           | -1 |
| Female | : | 34.5” bust full           | -1 |
| Female | : | 36.5” bust half           | -1 |
| Female | : | 36.5” bust full with hand | -1 |
| Female | : | half – 85 cm Half         | -1 |

### 3. Mannequins

#### i. Babbies

|      |           |    |
|------|-----------|----|
| Girl | - 77.8 cm | -1 |
| Girl | - 118.5cm | -1 |
| Boy  | - 80.5 cm | -1 |
| Boy  | - 127 cm  | -1 |

#### ii. Teenage Girls & Boys

|      |            |    |
|------|------------|----|
| Boy  | - 139 cm   | -1 |
| Girl | - 151 cm   | -1 |
| Girl | - 157.6 cm | -1 |

#### iii. Adults

|        |            |    |
|--------|------------|----|
| Male   | - 178 cm   | -1 |
| Male   | - 182.5 cm | -1 |
| Female | - 157.6cm  | -1 |
| Female | - 178 cm   | -1 |

|     |                            |      |
|-----|----------------------------|------|
| 4.  | Mechanical grading machine | - 1  |
| 5.  | Skirt Length Marker        | - 1  |
| 6.  | Neck Curves                | - 5  |
| 7.  | Jewellery bust half head   | -1   |
| 8.  | Jewellery bust Indian face | -1   |
| 9.  | Jewellery hand             | -2   |
| 10. | Pattern making kit         | - 30 |
|     | L scale                    |      |
|     | Hip curve                  |      |
|     | Meter scale                |      |
|     | French curve               |      |
|     | Tracing wheel              |      |
|     | Measuring tape             |      |
|     | Tailor's chalk             |      |
|     | Pencil                     |      |
|     | Set square                 |      |
| 11. | Grading scale              | -10  |
| 12. | Pattern master             | -10  |
| 13. | Paper cutting scissors     | - 30 |
| 14. | Hangers for patterns       | - 5  |

### Requirements of consumables (To be brought by students)

|     |                             |          |
|-----|-----------------------------|----------|
| 1.  | Long lasting Patterns       | - 50     |
| 2.  | See- through plastic sheets | - 50     |
| 3.  | Brown sheets                | - 100    |
| 4.  | 1: 4 Scale                  | - 10     |
| 5.  | 1: 2 Scale                  | - 10     |
| 6.  | Marking Scales              | - 50     |
| 7.  | Marking Chalks              | - 50     |
| 8.  | Carbon Paper                | - 100    |
| 9.  | Cloth for draping           | - 10m    |
| 10. | Tapes                       | - 2 pkts |
| 11. | Marking pencils             | - 50     |

**MA2263**

**PROBABILITY AND STATISTICS**

**L T P C**  
**3 1 0 4**

**(Common to Biotech, Chemical, Fashion, Petroleum, Polymer, Plastic)**

**OBJECTIVES**

At the end of the course, the students would

- Acquire skills in handling situations involving more than one random variable and functions of random variables.
- Be introduced to the notion of sampling distributions and have acquired knowledge of statistical techniques useful in making rational decision in management problems.
- Be exposed to statistical methods designed to contribute to the process of making scientific judgments in the face of uncertainty and variation.

**UNIT I           RANDOM VARIABLES**

**9 + 3**

Discrete and continuous random variables - Properties- Moments - Moment generating functions and their properties. Binomial, Poisson ,Geometric, Negative binomial, Uniform, Exponential, Gamma, and Weibull distributions.

**UNIT II           TWO DIMENSIONAL RANDOM VARIABLES**

**9 + 3**

Joint distributions - Marginal and conditional distributions – Covariance - Correlation and Regression – function of a random variable-Transformation of random variables - Central limit theorem.

**UNIT III           TESTING OF HYPOTHESIS**

**9 + 3**

Sampling distributions – Testing of hypothesis for mean, variance, proportions and differences using Normal, t, Chi-square and F distributions - Tests for independence of attributes and Goodness of fit.

**UNIT IV           DESIGN OF EXPERIMENTS**

**9 + 3**

Analysis of variance – One way classification – CRD - Two – way classification – RBD - Latin square.

**UNIT V           RELIABILTY AND QUALITY CONTROL**

**9 + 3**

Concepts of reliability-hazard functions-Reliability of series and parallel systems- control charts for measurements (x and R charts) – control charts for attributes (p, c and np charts)

Note : Use of approved statistical table is permitted in the examination.

**TOTAL : 60 PERIODS**

**TEXT BOOKS**

1. J. S. Milton and J.C. Arnold, “ Introduction to Probability and Statistics”, Tata McGraw Hill, 4<sup>th</sup> edition, 2007. (For units 1 and 2)
2. R.A. Johnson and C.B. Gupta, “Miller and Freund’s Probability and Statistics for Engineers”, Pearson Education, Asia, 7th edition, (2007)



## REFERENCES

1. Walpole, R. E., Myers, R. H. Myers R. S. L. and Ye. K, "Probability and Statistics for Engineers and Scientists", Seventh Edition, Pearsons Education, Delhi, 2002.
2. Navidi, W, "Statistics for Engineers and Scientists", Special Indian Edition, Tata McGraw-Hill Publishing Company Ltd, New Delhi,2008.
3. Spiegel, M.R, Schiller, J and Alu Srinivasan, R, "Schaum's Outlines Probability and Statistics", Tata McGraw-Hill Publishing Company Ltd. New Delhi ,2007.

FT 2251

GARMENT CONSTRUCTION

L T P C  
3 0 0 3

## AIM

To impart knowledge on Garment making.

## OBJECTIVES

- To teach the students about types of seams and stitches, sewing threads & their quality.
- To impart knowledge on various garment parts and their variations.
- To impart knowledge on use of accessories for garments.

## UNIT I

9

Basic Sewing Techniques:

**Seams:** Definition, Types of seams, seam quality, seam performance, factors to be considered in the selection of seam, seam finishes, seam defects.

**Stitches :** Definition, stitch classes, stitch parameters, factors to be considered in the selection of stitches. Stitching defects.

**Sewing Thread :** Types, construction, sewing thread quality, selection of sewing thread.

## UNIT II

9

**Sleeves:** Types of sleeves, plain, puffs, gathered, bell, bishop, circular, leg-o-mutton, Magyar sleeves dolman, kimono. Method of application. Mounting of sleeve – one piece, two piece.

**Collars:** Classification – full, flat, roll, partial roll, puritan collar, sailor collar, square collar, rippled collar, scalloped collar, mandarin, convertible, tie, shawl reverse and notch collar.

## UNIT III

9

**Yokes:** Definition – Selection of yoke design, different styles of yoke. Simple yoke – yokes with or without fullness – midriff yokes, methods of attaching yokes.

**Fullness:** Definition types, Darts – single, double, pointed darts, tucks, pin tucks, cross tucks, piped tucks, shell tucks, pleats, knife pleats, box pleats, invertible box pleats, kick pleats, flare, godets, gathers, shirrings, single or double frills. Ruffles.

**Hemming Techniques:** Definition, factors to be considered in the selection of hems, types of machine stitched hem, hand stitched hem.

**UNIT IV****9**

**Plackets:** Types, regular, top stitched with edge stitch, top stitched with one leg of pressure foot distance, concealed plackets, kurta plackets. Sleeve placket: faced placket, continuous bound placket and diamond placket.

**Pockets:** Types – patch pocket, patch with lining / flap, front hip, set-in seam, slash pocket with flap-single lip, double lip.

**Waist Band:** One piece, two piece and tailor waist band, elastic applied.

**Cuffs:** Types, square shape, round shape.

**UNIT V****9**

Introduction and construction techniques of garment closures. Application of zippers-fly, kissing lap, button & button holes, hooks, and eye snaps. Velcro, eyelets, cords. Basic standard of professional sewing. Relationship between pattern making and ultimate quality of finished sample, steps in the construction of sample, planning a logical garment construction sequence, planning a layout, analysis of component pieces and trimmings, economic use of fabric yardage, time effective sewing techniques.

**TOTAL : 45 PERIODS****TEXT BOOKS**

1. Cooklin Gerry, "Garment Technology for Fashion Designers", Blackwell Science Ltd., 1997.
2. Claire Shaeffer, "Sewing for apparel Industry", Prentice Hall, 2000.

**REFERENCES**

1. Leila Aitken, "Step by step dress making course", BBC Books, 1992.

**FT2252****FABRIC MANUFACTURE****L T P C  
3 0 0 3****AIM**

To impart knowledge on different fabric manufacturing technologies and machinery.

**OBJECTIVES**

- To teach preparatory processes and machinery for weaving
- To teach weaving, warp & weft knitting and non-woven technologies of fabric manufacturing and the machinery used.

**UNIT I****9**

Purpose and types of cone winding machines- Yarn clearers -Mechanical, Electrical- Pirn winding machine – Types – yarn faults. Warping & Sectional warping machines. Sizing – size ingredients.

**UNIT II****9**

Basic concepts of looms. Types of Looms – handloom – power loom – Automatic looms. Primary motions of a loom. Basic Principles of Tappet looms, Dobby looms, Drop box Looms, Jacquard looms – Card cutting. Basic concepts of Shuttle less looms – Rapier, projectile and Air jet looms. Salient features.

**UNIT III** **9**  
Basic Principles of Knitting – warp knitting – weft knitting, types of warp & weft knitting – yarn quality requirements for knitting – tuck, knit and miss stitch – courses and wales. Types of needles – latch, bearded and compound needles. Sinker - feeders – cylinders. Gauge of the machine. Cams – single-track – multi track.

**UNIT IV** **9**  
Pattern wheel, pattern drum – programmed tapes – punch tapes for jacquard weft knitting machines- Basic concept of warp knitting machines – width – gauge – needles – Tricot and Raschel warp knitting machine.

**UNIT V** **9**  
Non-Woven fabrics - Types – different methods of production of non wovens – needle punched, chemical & thermal bonded - application of non woven fabrics.

**TOTAL : 45**

**TEXT BOOKS**

1. Banerjee, "Weaving Mechanism Vol. 1 & 2".
2. Bernard P. Corbman, "Textile fibre to Fabric", McGraw-Hill, 1983.

**REFERENCES**

1. PR. Lord and Mohammed, "Weaving: Conversion of yarn to fabric", M.H.Merrine Publishing Co. Ltd., VK, 1998.
2. Spencer D.J., "Knitting Technology", Peramon press Oxford, 1982.
3. Non Wovens 77
4. Paling D.F., "Warp Knitting Technology" Columbine Press Baxton, 1975.
5. W.S. Murphy, "Hand Book of Weaving", Abhishek Publications 2001.

**FT2253**

**WOVEN FABRIC STRUCTURE & DESIGN**

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

**AIM**

To impart knowledge on various fabric structures / designs and their variations.

**OBJECTIVES**

To teach the students different types of woven fabric designs, their graphical representation and converting the design in to peg plan for weaving.

**UNIT I** **9**  
Elements of woven design: Construction of elementary weaves – plain – warp rib- weft rib – mat. Twills – modification of twills. Satin – sateen and their derivatives. Ordinary and Brighton honey comb– modifications. Crepe weaves.

**UNIT II** **9**  
Bedford cords: plain faced – twill faced. Wadded – modifications. Welt piques: wadded piques – Loose back and fast back welts and piques. Mock – leno – Distorted mock – leno. Spot figuring – arrangement of figuring for dobby and jacquard.

**UNIT III** **9**  
Color theory: light and pigment theory – modification of color – color combination – application of colors – color and weave effects. Extra warp and extra weft figuring. Extra warp and extra weft figuring with two colors.

**UNIT IV****9**

Backward fabrics: Warp and weft back – reversible and non-reversible. warp pile – fast wire pile – terry weaves - terry stripe – terry check. Weft pile: plain back – twill back velveteen – Lashed pile corduroy – Weft plush – Length, density and fastness of pile.

**UNIT V****9**

Double cloth: Classification – self stitched – face to back – back to face – Combination face to back and back to face stitched double cloth. Wadded double cloth – weft and warp Wadded double cloth – Center warp & Weft Stitched double cloth. Basic Dobby, Jacquard Design.

**TOTAL : 45****TEXT BOOK**

1. Grosicki Z., "Watson's Textile Design & Colour: Elementary weaves & Figure", Blackwell Science, Commerce place, 1998.

**REFERENCES**

1. H.Nisbet, "Grammar of textile Design", Tarporevala sons & Co. Pvt. Ltd., 1994.
2. W.S. Murphy, "Textile weaving & Design", Abhishek Publications, 2000.

**FT2254      GARMENT PRODUCTION MACHINERY AND EQUIPMENT – I      L T P C**  
**3 0 0 3**

**AIM**

To teach the students various process in garment manufacturing and different types of machines used.

**OBJECTIVES**

- To expose the students to various types of machines used for fabric spreading and cutting.
- To teach the students, functioning of different types of sewing machines and formation of different stitch.

**UNIT I****9**

Types of Fabric Packages – Types of Fabrics – One Way – Two Way Fabrics – Their effect on spreading – Methods of Fabric spreading – Spreading equipments – Computerized spreaders – Marker making – Marker efficiency – Factors affecting marker efficiency – Marker duplicating methods – Computer aided marker making.

**UNIT II****9**

Introduction to cutting machines – Types and functions of cutting machines – straight knife, round knife, band knife, cutting machines – Notches, drills, die cutting machines – Computerised cutting machines – maintenance of cutting machines – common defects in cutting & their remedies.

**UNIT III****9**

Types of needles – Parts of needles and their function – Needle size - sewing thread – properties of sewing threads – ticket number – fabric sewability. Seam quality – effect of stitch type on seam quality. Selection of seam and stitch.

**UNIT IV** **9**  
Federal classification of seam and stitches – Basic parts of sewing machine – Needle – Bobbin case / Bobbin hook, Loopers – Loop spreader – Threading fingers – Throat plate – Tongue chaining plates – Take up devices – Tensioners – Feed dog – Pressure foot.

**UNIT V** **9**  
Basic SNLS machine – Parts & their function – Adjustments – Stand height – pedal – Needle Bar – Pressure foot – Feed dog – Differential feed ratio – Reverse feed – Stitch length selection – Feed timing – Needle & Bobbin Thread Tension – Stitch cycle timing diagram.  
Maintenance of SNLS machine – Common defects and remedies.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Harold Carr & Barbara Itham, "The Technology of Clothing Manufacture", Om Book Service, 1994.
2. Laing R.M., Webster J, "Stitches & Seams", The Textile Institute, India, 1998.

**REFERENCES**

1. Shaeffer Claire, "Sewing for the Apparel Industry", Prentice Hall, New Jersey, 2001.
2. Singer, "Sewing Lingerie", Cy DeCosse Incorporated, 1991.

**FT 2255** **DYEING, PRINTING & POLLUTION CONTROL** **L T P C**  
**3 0 0 3**

**AIM**

To teach the students the technology of wet processing.

**OBJECTIVES**

- To teach the students the various bleaching, dyeing, printing & finishing technologies for the various fabrics & garments.
- To educate the students on pollution control techniques.

**UNIT I** **BLEACHING** **9**  
Bleaching of cotton with hypochlorites, hydrogen peroxide and sodium chlorites – jigger dyeing, winch dyeing – calendering – steam calendering.

**UNIT II** **DYEING** **9**  
Method of dyeing cotton with direct reactive and vat dyes – dyeing of polyester/cotton – polyester/viscose blends – fastness of different dyeing methods. Different dyeing equipments – soft flow dyeing jet dyeing – J.Box advantages and disadvantages over conventional jigger / winch dyeing – shrinkage control of knitted goods – compactors – study of package yarn dyeing machines. Balloon – drying, relax dryers. Garment dyeing Machines.

**UNIT III** **PRINTING** **9**  
Block, roller, flat bed, rotary and transfer printing Techniques – pigments – reactive – Discharge and resist printing – advantages and disadvantages – screen making – engraving – study of chest and rotary screen printing machines to knitted goods.

**UNIT IV FINISHING****9**

Garment finishes – Different types of finishes – Enzyme wash, stone wash, acid wash, salt and pepper finish, peach finish, sand blasting, - wrinkle free finish.

**UNIT V****9**

Causes of water pollution – domestic, industrial, agricultural wastes – DO, BOD, COD – treatment – primary and secondary – sludge disposal- Air pollution – environmental impact – Acid rain – green house effect.

**TOTAL : 45 PERIODS****TEXT BOOK**

1. V.A. Shenai, "Technology of Textile Processing – Volume III, V, VII & VIII", Sevak publications, Bombay, 1981.
2. Nitra, "Pollution Control in Textile Mill", NITRA Publishing Ltd., 2001.

**REFERENCES**

1. Palmer John. W, "Textile Processing and Finishing aids recent advance", Mahajan Book Distributors, 1996.
2. James Ronald .W, "Printing and Dyeing of fabrics and Plastics", Mahajan Book Distributors 1996.

**FT 2257****BASIC GARMENT & CONSTRUCTION LAB****L T P C****0 0 3 2****AIM**

To impart knowledge on Garment making

**OBJECTIVES**

- To teach the students about the types of seams and stitches, sewing threads and their quality.
  - To impart knowledge on various garment parts and their variations
  - To impart knowledge on use of accessories for garments.
1. Prepare samples for basic Hand stitches, seams, darts & pleats.
  2. Preparing samples for plackets – continuous bound placket, 2 piece placket, tailors placket, Fly opening & Zipper.
  3. Preparing samples for Necklines – Bias facing, Bias Binding & Fitted facing.
  4. Preparing samples for collars – Peter Pan collar, Full shirt collar, Shawl collar.
  5. Preparing samples for pockets – patch pocket, bound pocket & front hip pocket.
  6. Preparing samples for Sleeves – Plain, Puff, Raglan, Kimono.

**BASIC GARMENT CONSTRUCTION LAB****MACHINES REQUIRED: ( for a batch of 30 students )**

- |                                      |        |
|--------------------------------------|--------|
| 1. Single needle lock stitch machine | 30 Nos |
| 2. Steam Iron Box                    | 3 Nos  |

**CONSUMABLES:**

Needles  
Canvas material  
Sewing threads

Fusing canvas  
Elastics  
Sponge  
Fasteners

**TOTAL : 45 PERIODS**

**FT2258**

**DYEING AND PRINTING LAB**

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

**AIM**

To teach the students the technology of wet processing

**OBJECTIVES**

To teach the students the various bleaching, dyeing, printing and finishing technology for the various fabrics and garments.

1. Identification of fibres- Polyester/Cotton, Polyester/Viscose & Cotton/Viscose.
2. Bleaching of cotton using Hypochlorites.
3. Bleaching of cotton using Hydrogen peroxide.
4. Dyeing of cotton with Direct dyes.
5. Dyeing of cotton with Reactive dyes.
6. Dyeing of cotton with Vat dyes.
7. Dyeing of Polyester using carrier.
8. Dyeing of Knitted Fabric.
9. Determination of Fastness to washing after dyeing.
10. Determination of Shrinkage for woven fabrics/garments.
11. Discharge style- printing on cotton.
12. Resist style- printing on cotton.
13. Computer aided color matching.

**TOTAL : 45**

**Dyeing and Printing Lab**

**LIST OF EQUIPMENTS**  
**(For a batch of 30 students)**

| <b>S. No</b> | <b>Description</b>  | <b>Quantity required</b> |
|--------------|---|--------------------------|
| 1            | Chemical and dyes   |                          |
| 2            | HTHP Beaker dyeng machine   | 1                        |
| 3            | Pilot Winch   | 1                        |
| 4            | Sample cone/cheese dyeing machine   | 1                        |
| 5            | Pilot curing Chamber  | 1                        |
| 6            | Pilot curing Chamber  | 1                        |
| 7            | pH meter  | 1                        |
| 8            | Oven (upto 200C)  | 1                        |
| 9            | Burners   | 30                       |
| 10           | Glass wares and apparatus (Beakers of required volume, Pipette with extracting device, burette, Glass rods, Measuring jars 10ml, 100ml and 500ml) | 25 each                  |
| 11           | Stainless steel vats (500 ml)   | 30                       |
| 12           | Water bath  | 15                       |
| 13           | Thermometers  | 6                        |
| 14           | Stirrer   | 2                        |
| 15           | Ager  | 1                        |
| 16           | Electronic Balance (0.01g to 300g)  | 2                        |

|    |                 |   |
|----|-----------------|---|
| 17 | Printing screen | 1 |
| 18 | Printing table  | 1 |
| 19 | Squeeze         | 1 |

**FT 2259**

**TEXTILE CAD & FABRIC STRUCTURE LAB**

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

**AIM**

To develop software to design and simulate the fabric structure and its characteristics.

**LIST OF EXPERIMENTS**

1. Develop a Dobby Design & prepare a 2D simulation
2. Develop a Jacquard Design & prepare a 2D simulation
3. Develop a Print Design & prepare a 2 D simulation
4. Develop a Dobby design with different weaves
5. Develop a Jacquard design & prepare a card punching for the same.
6. Analysis of woven designs: plain, twill, satin- huck-a-back.
7. Dobby & jacquard cloth analysis.
8. Extra warp & extra weft figuring.
9. Double cloth & terry towels.

**TOTAL : 45 PERIODS**

**Textile CAD & Fabric Structure Lab**

**LIST OF EQUIPMENTS REQUIRED**

**Textile Fabric Designing Soft Wares:**

Module : Designing Dobby Design  
 Designing Jacquard Design  
 Designing Print design.

**Hard Ware :**

Pentium III / higher PCs – 15 Nos with suitable  
 Configuration to Support the Software  
 Printer 1 No  
 Plotter 1 No  
 Scanner 1No  
 Counting Glass 15Nos  
 GSM Cutter & Scale 2No  
 Beesley's Balance 2No  
 Course length tester 1No  
 Electronic Balance. 1No



**UNIT I ENGINEERING ETHICS****9**

Senses of 'Engineering Ethics' – Variety of moral issues – Types of inquiry – Moral dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory – Consensus and Controversy – Professions and Professionalism – Professional Ideals and Virtues – Uses of Ethical Theories.

**UNIT II ENGINEERING AS SOCIAL EXPERIMENTATION****9**

Engineering as Experimentation – Engineers as responsible Experimenters – Research Ethics - Codes of Ethics – Industrial Standards - A Balanced Outlook on Law – The Challenger Case Study

**UNIT III ENGINEER'S RESPONSIBILITY FOR SAFETY****9**

Safety and Risk – Assessment of Safety and Risk – Risk Benefit Analysis – Reducing Risk – The Government Regulator's Approach to Risk - Chernobyl Case Studies and Bhopal.

**UNIT IV RESPONSIBILITIES AND RIGHTS****9**

Collegiality and Loyalty – Respect for Authority – Collective Bargaining – Confidentiality – Conflicts of Interest – Occupational Crime – Professional Rights – Employee Rights – Intellectual Property Rights (IPR) - Discrimination

**UNIT V GLOBAL ISSUES****9**

Multinational Corporations – Business Ethics - Environmental Ethics – Computer Ethics - Role in Technological Development – Weapons Development – Engineers as Managers – Consulting Engineers – Engineers as Expert Witnesses and Advisors – Honesty – Moral Leadership – Sample Code of Conduct

**TOTAL: 45 PERIODS****TEXT BOOKS**

1. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw Hill, New York, 2005.
2. Charles E Harris, Michael S Pritchard and Michael J Rabins, "Engineering Ethics – Concepts and Cases", Thompson Learning, 2000.

**REFERENCES**

1. Charles D Fleddermann, "Engineering Ethics", Prentice Hall, New Mexico, 1999.
1. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, 2003
3. Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, 2001.
4. Prof. (Col) P S Bajaj and Dr. Raj Agrawal, "Business Ethics – An Indian Perspective", Biztantra, New Delhi, 2004.
5. David Ermann and Michele S Shauf, "Computers, Ethics and Society", Oxford University Press, (2003).

**AIM**

To impart knowledge on embroidery and Ornamentation techniques and machines

**OBJECTIVES**

- To impart knowledge on hand & machine embroidery and ornamentation needles and threads
- To impart knowledge on different embroidery structures
- To impart knowledge on different computerized embroidery machines

**UNIT I****9**

Introduction and origin of embroidery – general rules for hand and machine embroidery, Attachments of sewing machines for embroidery – Selection of needle, threads & fabrics for embroidery.

**UNIT II****9**

Knowledge, classification & practice of hand embroidery stitches- running, couching, button hole, satin, long & short, wheat, chain, stem, herringbone, cross stitch, knotted stitches, fish bone etc. Some Indian traditional embroideries – Phulkari, Kasuti, Kashmiri embroidery, kutch work, chikkankari, kantha, tribal embroideries- stitches, designs, colors and materials used.

**UNIT III****9**

Knowledge & practice of the following machine embroideries and surface ornamentations– eyelet work, cutwork, Richelieu work, lace work, drawn thread and fabric work, patch work, mirror work, applique, shaded embroidery, shadow work, badala work, bead and sequins work, bobbin thread embroidery etc.

**UNIT IV****9**

Selection of thread color and suitable stitches for embroidery using computer –Care and maintenance of embroidery articles – pressing embroidery articles – frames & backing materials Types & Purposes. Estimating, costing & marketing of finished embroidery goods.

**UNIT V****9**

CAD Softwares used for embroideries – process of designing, types of stitch applications, punching. Types of embroidery machines and their working –vertical embroidery machines, multi-head embroidery machines- Special attachments in Embroidery machines

**TOTAL: 45 PERIODS****TEXT BOOKS**

1. Sheila Paine, "Embroidered textiles", Thames and Hudson Ltd., 1990.
2. Gail Lawther, "Inspirational Ideas for Embroidery on clothes & Accessories", Search Press Ltd., 1993.

**REFERENCES**

1. Shailaja D. Naik, "Traditional Embroideries of India", A.P.H Publishing Corporation, New Delhi, 1996.

**AIM**

To impart knowledge on principles and procedures for Children's and Men's apparel Construction

**OBJECTIVES**

- To impart knowledge on principles of taking measurements and Construction of Children's and Men's wear
- To impart knowledge on fabric selection and minimizing of fabric consumption for Children's and Men's wear

**UNIT I****9**

Study of various types of kids wear and children's wear; measurements required for construction of kids & children's wear (Baba suit, Baby frock, shorts, Rompers, Pedal pushers). Selection of fabrics, trimmings, seams for Children's wear. Factors affecting selection

**UNIT II****9**

Pattern lay rules, common method of layout for asymmetric design, strips, checks and one way design for children's garments. Fit for children's garments.

**UNIT III****9**

Step by step procedure for construction and minimizing fabric consumption for men's Boxer shorts, formal shirts with regular collar, button down collar- plackets – back tucks center and side tucks – Balancing of designs – Asymmetric & symmetric designs - checks & stripes.

**UNIT IV****9**

Step by step procedure for construction and minimizing fabric consumption for Men's formal trouser: – principles involved in fitting –step-by-step construction procedure for men's trousers. Formal trouser – pleated and flat front – Double welt and single welt back pockets- 5 pocket casual trousers.

**UNIT V****9**

Step by step procedure for construction and minimizing fabric consumption for Men's suits: – principles of fit- step by step construction of 2 piece and 3 piece suits – single and double breasted suits.

**TOTAL: 45 PERIODS****TEXT BOOKS**

1. Singer, "Sewing Active Wear", Cy DeCosse Incorporated, 1986.
2. Singer, "Sewing Pants That Fit", Cowles Creative Publishing Inc., 1989

**REFERENCES**

1. Patric John Ireland, "Fashion Design Illustration: Men", B.T Batsford Ltd., London, 1996.
2. Cooklin Gerry, "Pattern Grading for Children's", Om Book Service, 1991.

**AIM**

To impart knowledge on design and manufacture of women's wear & lingerie

**OBJECTIVES**

- To impart knowledge on principles of body measurements for women's wear & lingerie
- To impart knowledge on manufacturing different types of women's wear, lingerie selection of fabric and accessories.

**UNIT I****9**

Importance and principles of taking body measurements – measurement required for construction of women's garments – preparing basic patterns for bodice, sleeves, bifurcated garments, necklines – hood.

**UNIT II****9**

Step by step procedure for pattern making & construction, nigh ties, blouses, midi skirts & tops – dart manipulation – dart relocation by pivot.

**UNIT III****9**

Method – connectivity darts into seams –fitting problems. Step by step Procedure for pattern makes and construction of salwar kameez – selection of thread, color, material – embroidery using computer – bead work and tinged work.

**UNIT IV****9**

Step by step pattern making – construction for trousers and peach bottom – pleated trousers - skirts 'A' line – umbrella- 6 gore skirt – circular skirt.

**UNIT V****9**

Intimate apparels – Different types of fitting for ladies inner wear – step by step procedure of construction – brassiers – size & fit – ladies panties- – other lingerie's - use of Elastomeric yarns in lingerie.

**TOTAL: 45 PERIODS****TEXT BOOKS**

1. Harold Carr & Barbara Latham, "The technology of Clothing Manufacture", Blackwell Science Inc., 1994
2. Singer, "Sewing Lingerie", CY DeCosse Incorporated, 1991.

**REFERENCE**

Gerry Cooklin, "Garment technology for Fashion Designers", Blackwell Science, 1997

**AIM**

To educate the students about warp and weft knitted fabric structures and their variations

## OBJECTIVES

- To educate the students on basis of knit structures and mechanisms available for design variation.
- To educate the students on single jersey knit structure and its derivatives
- To impart knowledge on double jersey knit structure and its derivatives
- To educate the students on warp knit structure and its derivatives

## UNIT I

9

Knit Stitch, float stitch, Tuck stitch, Symbolic (Graph paper) representation of stitches, Diagrammatic representation of stitches. Patterning mechanism: Pattern wheel, Pattern drum, peg drum machine, punched steel tape, Jacquard punched paper roll Jacquard, Electronic devices for needle selection.

## UNIT II

9

Derivatives of plain knit: Design development of single jersey - piques, Accordion type of fabrics, plated fabrics.

## UNIT III

9

Ornamentation of rib structure 2X2 rib structure, half cardigan, Full cardigan, derivatives of Inter lock structures; Eight lock, Punto-di-Roma, Ottoman rib, Bourrelet, TEXI- pique. PIN-JUCK Milano rib, French Pique, Swiss Pique

## UNIT IV

9

Representation of warp knit structures. Point Paper, Chain-Link Notation, single fabrics: Chain stitch, Tricot lap, Extension of 1 and 1 lapping, Full tricot, Lock Knit, Reverse Lock Knit, satin, Loop raised fabrics, Queen's cord, Sharkskin, Blind lap, open work effects, Marquisette, sand- flair net, Hexagonal net.

## UNIT V

9

Study of fleece fabrics, Study of knitted fabrics with Elastomeric yarn - Different combinations for different properties

**TOTAL: 45 PERIODS**

## TEXT BOOKS

1. Ajgaonkar, D.B, "Knitted Technology", Universal Publishing Corporation, Bombay, 1998.
2. Foster Jack Stroud, Harington Raymond, "Structure & Fabric", Blackwell Science Ltd., 1996.
3. Anbumani, N., Knitting Technology, New Age Publishers 2005.
4. Spencer, D.J., Knitting Technology, pergaruoa Press 2007.

**FT2305**

**TESTING AND QUALITY CONTROL OF TEXTILES  
AND APPARELS**

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

## AIM

To impart knowledge on yarn, fabric and garment testing and quality control

## OBJECTIVES

- To impart knowledge on sampling and yarn quality parameters testing
- To impart knowledge on fabric and garment quality parameters testing

**UNIT I** **9**

**SAMPLING TECHNIQUES:** Definition – random- Biased- Techniques for fibre, Yarns and fabrics Standard RH and temperature for testing and mechanical processing

**YARN TESTING:** Direction of twist – Twist multipliers. Twist testers. Tension type – Take-up -ATIRA Direct type testers, Yarn Hairiness Testing - Methods – Optical – Singeing

**UNIT II** **9**

**YARN TESTING:** – YARN count – Instruments used for count determination –analytical balance – Knowles balance – quadrant balance –Beesley balance- electronic yarn count and yarn diameter.

**CLASSIFICATION OF VARIATION:** – Methods of measuring evenness – Black board – ASTM standards – Cutting and weighing methods – Electronic capacitance – Uster evenness tester – Uster standards – Yarn faults – classification – Uster Classimat.

**UNIT III** **9**

**FABRIC TESTING:** Crimp – Influence crimp on fabric properties – Shirley crimp tester fabric tensile strength tester – raveled strip method – Grab methods. Elmendorf of tester Ballistic tester – Hydraulic bursting strength tester Fabric Abrasion Resistance – handle-Serviceability assessment Martindale abrasion tester **FABRIC PILLING:** I.C.I Pillbox tester.

**UNIT IV** **9**

**FABRIC DRAPE:** Measurement – Drape meter. **FABRIC STIFFNESS:** Shirley Stiffness tester Fabric crease resistance and crease recovery measurements.

**FABRIC PERMEABILITY:** Shirley air permeability tester – Fabric water permeability tester – Friction measuring instruments.

**UNIT V** **9**

**APPAREL TESTING:** Seam strength testing – Seam severance testing. Evaluation of interlinings quality Colour fastness testing Apparel dimensional stability testing

**TOTAL: 45 PERIODS**

**TEXT BOOK**

1. Grover E G and Hamby D. S “Hand Book of Textile testing and quality Control”, Wiley Eastern Pvt. Ltd., New Delhi, 1969.

**REFERENCES**

1. Sundaram V, “Hand book of Textile Testing”, CTRL Publication, Bombay.
2. BSI, “BSI Hand books”, British Standard Institution, Manchester.
3. BIS, “BIS Hand Books”, Bureau of Indian standards, Delhi, 1989.
4. J.E.Booth- “Principles of Textile Testing”, CBS Publishers & Distributors, 1996.
5. Sundaram .V Hand book of Textile 2005.
6. Sreenivasam . S, Test of CIRWT, MUMBAI.

**FT2307**

**TESTING & QUALITY CONTROL LAB**

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

**AIM**

To impart knowledge on yarn, fabric and garment testing and quality control.

## OBJECTIVES

- To impart knowledge on sampling and your quality parameters testing.
- To impart knowledge of fabric and garment quality parameters testing.

## LIST OF EXPERIMENTS

Determination of count of yarn and CV %

Determination of yarn Strength (Lea strength) CV% and CSP

Determination of yarn Appearance – Grades.

Determination of yarn evenness and Imperfections

Determination of single yarn Twist and CV%

Determination of Fabric Tensile strength CV%

Determination of crimp in Yarn

Determination of Abrasion Resistance

Determination of Fabric bursting strength

Determination of fabric washing fastness

Determination of Shrinkage of knitted and woven fabrics

Determination of color fastness to rubbing - Crock meter

Analyzing of Woven and knitted fabric EPI, PPI, Wales and courses per inch, loop length, GSM, Cover factor.

Determination of fabric stiffness and crease recovery angle

Determination of fabric Drape

**TOTAL: 45 PERIODS**

## TEXTILE TESTING & QUALITY CONTROL LAB

### LIST OF EQUIPMENT:

|  |      |
|--|------|
| Wrap Reel and weighing balance                   | - 1  |
| Automatic wrap reel and lea strength tester      | - 1  |
| Yarn Appearance tester                           | - 1  |
| Yarn evenness tester                             | - 1  |
| Single yarn twist tester                         | - 1  |
| Fabric tensile strength tester                   | - 1  |
| Crimp tester                                     | - 1  |
| Abrasion tester                                  | - 1  |
| Fabric bursting strength tester                  | - 1  |
| Washing machine                                  | - 1  |
| Crock meter                                      | - 1  |
| Fabric stiffness tester & Crease recovery tester | - 1  |
| Drape meter                                      | - 1  |
| Beesley's Balance                                | - 1  |
| Counting Glass                                   | - 30 |

**FT2308**

**GARMENT CONSTRUCTION LAB - I**

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

### AIM:

To impart knowledge on Garment making

**OBJECTIVES:**

- To teach the students about types of seams and stitches, sewing thread and their quality
- To impart knowledge on various garment parts and their variations
- To impart knowledge on use of accessories for garments

**LIST OF EXPERIMENTS**

Step by step Construction of Children's Baba suit  
 Step by step Construction of Children's Rompers  
 Step by step Construction of Children's Frock  
 Step by step Construction of Men's Shorts  
 Step by step Construction of Men's Formal Shirt (2 sessions)  
 Step by step Construction of Men's Formal Trouser (2 sessions)  
 Step by step Construction of Men's Casual Trouser (2 sessions)

**TOTAL: 45 PERIODS****GARMENT CONSTRUCTION LAB I****MACHINES REQUIRED: (For a Batch of 30 Students)**

|  |   |       |
|--|---|-------|
| 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.  | - | 1each |
| Ironing Table                              | - | 1     |
| Steam Iron Box                             | - | 1     |

**CONSUMBALES: (to be brought by students)**

Needles  
 Canvas Material  
 Sewing Threads  
 Fusing canvas  
 Elastics  
 Sponge  
 Fasteners

**GE2321****COMMUNICATION SKILLS LABORATORY****L T P C  
0 2 0 1****AIM:**

Globalization has brought in numerous opportunities for the teeming millions, with more focus on the students' overall capability apart from academic competence. Many students, particularly those from non-English medium schools, find that they are not preferred due to their inadequacy of communication skills and soft skills, despite possessing sound knowledge in their subject area along with technical capability. Keeping in view their pre-employment needs and career requirements, this course on Communication Skills Laboratory will prepare students to adapt themselves with ease to



the industry environment, thus rendering them as prospective assets to industries. The course will equip the students with the necessary communication skills that would go a long way in helping them in their profession.

**OBJECTIVES:**

- To equip students of engineering and technology with effective speaking and listening skills in English
- To help them develop their soft skills and people skills, which will make the transition from college to workplace smoother and help them to excel in their jobs
- To enhance students' performance at Placement Interviews, Group Discussions and other recruitment exercises.

|                            |                        |                   |
|----------------------------|------------------------|-------------------|
| <b>I. PC BASED SESSION</b> | <b>(WEIGHTAGE-40%)</b> | <b>24 PERIODS</b> |
|----------------------------|------------------------|-------------------|

**A. ENGLISH LANGUAGE LAB** (18 Periods)

**1. LISTENING COMPREHENSION** (6)

Listening and typing – Listening and sequencing of sentences –  
Filling in the blanks – Listening and answering the questions

**2. READING COMPREHENSION AND VOCABULARY** (6)

Filling in the blanks - Cloze Exercises – Vocabulary building –  
Reading and answering questions

**3. SPEAKING** (6)

**Phonetics:** Intonation – Ear Training – Correct Pronunciation –  
Sound recognition exercises -Common Errors in English

**Conversations:** Face to Face Conversation - Telephone conversation –  
Role plays activities (Students take on roles and engage in conversation)

**B. CAREER LAB** (6 periods)

**(Samples are available to learn and practice in the class room session)**

**1. RESUME / REPORT PREPARATION / LETTER WRITING** (1)

Structuring the resume / report – Letter writing / E-mail communication –  
Samples

**2. PRESENTATION SKILLS** (1)

Elements of an effective presentation – Structure of a presentation –  
Presentation tools – Voice Modulation – Audience analysis – Body  
Language – Video Samples

**3. SOFT SKILLS** (2)

Time Management – Articulateness – Assertiveness – Psychometrics –  
Innovation and Creativity – Stress Management & Poise – Video Samples

**4. GROUP DISCUSSION** (1)

Why is GD part of selection process? – Structure of a GD – Moderator-led  
And other GDs – Strategies in GD – Team work – Body Language – Mock  
GD – Video Samples

**5. INTERVIEW SKILLS** (1)

Kinds of Interviews – Required Key Skills – Corporate culture – Mock  
Interviews – Video Samples

|   |                   |
|---|-------------------|
| <b>II. CLASS ROOM SESSION (WEIGHTAGE-60%)</b> | <b>24 PERIODS</b> |
|---|-------------------|

**Resume / Report Preparation /Letter writing:** Students prepare their  
Own resume and report. (2)

**Presentation Skills:** Students make presentations on given topics. (8)

**Group Discussion:** Students participate in group discussions. (6)

**Interview Skills:** Students participate in Mock interviews. (8)

Note: Classroom sessions are practice sessions.

**EQUIPMENTS / SOFTWARE REQUIRED FOR COMMUNICATION SKILLS  
LABORATORY**

**I. PC BASED SESSION: (For 60 user network environment)**

60 P-IV PCs and one server

**Server**

PIV system  
1 GB RAM / 40 GB HDD  
OS: Win 2000 server  
Audio card with headphones (with mike)  
JRE 1.3

**Client Systems**

PIII or above  
256 or 512 MB RAM /40 GB HDD  
OS: Win 2000  
Audio card with headphones (with mike)  
JRE 1.3

Interactive Teacher Control Software:

English Language Lab Software:

Career Lab software:

## II. CLASS ROOM SESSION:

### ESSENTIAL:

- a) Handicam Video Camera (with video lights and mic input)
- b) Television - 29"
- c) Collar mike (1) and cordless mikes (3) with audio mixer
- d) DVD Recorder / Player

### DESIRABLE:

LCD Projector with MP3 /CD /DVD provision for audio / video facility

## REFERENCES:

1. Meenakshi Raman and Sangeetha Sharma, Technical Communication – Principles and Practice, Oxford University Press, New Delhi (2004)
2. Barker. A - Improve your communication skills – Kogan Page India Pvt Ltd, New Delhi (2006)
3. Adrian Doff and Christopher Jones – Language in Use (Upper-Intermediate), Cambridge University Press, First South Asian Edition (2004)
4. John Seely, The Oxford Guide to writing and speaking, Oxford University Press, New Delhi (2004)

## GUIDELINES FOR THE COURSE

### COMMUNICATION SKILLS LABORATORY

A batch of 60 / 120 students is divided into two groups – one group for the PC- based session and the other group for the Class room session.

The English Lab (2 Periods) will be handled by a faculty member of the **English Department**. The Career Lab (2 Periods) may be handled by any competent teacher, **not necessarily from English Department**

**RECORD NOTEBOOK:** At the end of each session of English Lab, review exercises are given for the students to answer and the computer evaluated sheets are to be compiled as record notebook. Similar exercises for the career lab are to be compiled in the record notebook.

**INTERNAL ASSESSMENT:** The 15 marks (the other 5 marks for attendance) allotted for the internal assessment will be based on the record notebook compiled by the candidate. 10 marks may be allotted for English Lab component and 5 marks for the Career Lab component.

**END SEMESTER EXAMINATION:** The end-semester examination carries 40% weight age for English Lab and 60% weight age for Career Lab.



**REFERENCES:**

1. Churter, A.J., "Introduction to Clothing Production Management", Oseney Mead, 1995.
2. Carr Harold, Latham Barbara, "The Technology of Clothing Manufacture", Om Book Service, 1994.
3. Bracken Bury, "Knitted Clothing Technology", Om Books Service, 1999.
4. Gerry Cooklin, "Introduction to Clothing Manufacture", Blackwell Science Ltd., 1995.
5. Gerry Cooklin, "Garment Technology for Fashion Designers", Om Books service, 1997.

**FT2352****ADVANCED PATTERN MAKING****L T P C  
3 0 0 3****AIM**

To impart knowledge on pattern making for children, men and women's garments

**OBJECTIVES**

- To teach the students to create patterns with seam and cutting allowance for Children, men and women's garments
- To teach students in solving fitting problems in patterns
- To impart knowledge on draping techniques

**UNIT I****9**

Development of Design and patterns using  $\frac{1}{4}$  scale for women's formal wear – Trousers and shirt. Women's casual wear – house coat, Ladies jeans Women's party wears – Single piece party dress, Churidhar.

**UNIT II****9**

Development of Design and patterns using  $\frac{1}{4}$  scale for Men's formal wear – Shirts, Trousers. Men's casual wear – Pyjama, Bermudas, Men's - party wear – Sherwani Kurtha

**UNIT III****9**

Development of Design and patterns using  $\frac{1}{4}$  scale for Children's Uniform, Children's Play time dress, Children's Night dress.

**UNIT IV****9**

Solving fitting problems for Men's wear, Women's wear. Children's wear – Principles of good fit, alternation of patterns for defective, unusual figures

**UNIT V****9**

Draping-Introduction on dress forms, draping skills – preparation of bodice pattern, skirt (A-line skirt, 6 gore skirt, circular skirt), sleeve, pant and collar (convertible collar, peter pan collar, turtle neck collar, shawl collar) in draping method. Techniques of draping – neckline cowl, side seam cowl, bias cowl, bustier, flounces, peplum

**TOTAL: 45 PERIODS****TEXT BOOKS**

1. Gerry Cooklin "Master Patterns & Grading for Women's Outsizes Blackwell Scientific Publications (1995) ISBN: 0 – 632- 03915 – 9.

- Gerry Cooklin "Master Patterns & Grading for Men's Outsize", Blackwell Scientific Publications 1992.

## REFERENCES

- Gillian Holman -Pattern Cutting Made Easy, Blackwell Scientific Publications (1997). ISBN: 0- 7134 – 8093-
- Natalie Bray "More Dress Pattern Designing" Blackwell Scientific Publications (1986) ISBN: 0-632-01883- 6.

**FT2353                      GARMENT PRODUCTION MACHINERY & EQUIPMENT- II                      L T P C  
3 0 0 3**

### AIM:

To impart the knowledge about various machineries and equipments used in garment manufacturing process.

### OBJECTIVES:

- To impart knowledge on fabric spreading, marker making machines and equipments and their advancements
- To educate on different types of cutting machines, cutting blades and their merits and demerits
- To teach the students about various types of cutting machines, their selection and trouble shooting in sewing machines

### UNIT I 9

Introduction to special sewing machines – Types of special machines – Overlook, Flat lock, Button hole sewing, Button sewing, Feed of arm, Riveting.

### UNIT II 9

Over lock machines - Types of Over lock machines. Threading diagram for over lock machines Stitch Timing Diagram for over lock machines – Adjustment of parts of over lock machines – Needle height – Feed dog height, angle – Differential feed ratio – Position of upper & Lower knives – Loopers. Maintenance of over lock machine Defects & Remedies.

### UNIT III 9

Flat lock machines – Types – threading diagram of flat lock machines – Stitch turning Diagram – Stitch Sequence – Adjustment of parts – Needle height – feed dog height, A differential feed ratio – Loopers maintenance of flat lock machines – Defects & Remedies.

### UNIT IV 9

Work aid & attachment in sewing machines – Rollers – Guides, Folders, Compacting Pressure foot, hemmer – Placket making, pocket making attachments, collar turning machines – Garment folding machines, Fusing & Pressing machines.

### UNIT V 9

Special purpose sewing machines – Feed of Arm, Button Hole sewing, button sewing, Bar tack, blind stitch machines – Automation in sewing machines – Unit production system – Computerized anal Sewing machines.

**TOTAL: 45 PERIODS**

### TEXT BOOKS

- Harold Carr& Barbara Latham," The Technology of Clothing Manufacture", Om Book Service, 1994.

2. Jacob Solinger, "Apparel Manufacturing Handbook", Reinhold Publications, 1998.

## REFERENCES

1. Laing R.M., Webster J, "Stitches & Seams", The Textile Institute, Manchester, U.K 1998.
2. Shaeffer Claire, "Sewing for the Apparel Industry", Prentice Hall, New Jersey, 2001.
3. Singer, "Sewing Lingerie", Cy DeCosse Incorporated, 1991.

**FT2354**

**CLOTHING CARE**

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

### AIM

To impart knowledge on different garment care techniques and machines

### OBJECTIVE

To impart knowledge on machinery and equipments for garment care

### UNIT I

**9**

Study of finishing room equipments – steam iron – steam busters – vacuum ironing tables – form finishing equipments – trouser toppler, shirt press, collar/cuff press, form finisher for jackets and coats – study of boiler and related equipment for finishing room Fusing machines for interlinings Water treatment plant –soft water –hard water – methods of softening water

### UNIT II

**9**

Study of laundry equipment and laundry reagents – soaps – detergents – cleaning action of soaps, indigenous cleaning agents – rita nut-shikkai – green gram – bran solution – study of modern and industrial cleaning agents.

### UNIT III

**9**

Study of stiffening agents – Natural and commercial starches – preparation of starch for use – Bleaching agents – blueing and tinting agents and their application – optical whiteners

### UNIT IV

**9**

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

**9**

Study of different types of house hold/industrial washing machines- rotary –swirling – pressure – tumble wash etc

**TOTAL: 45 PERIODS**

### TEXT BOOKS

1. Dantyagi S., "Fundamentals of Textile and their care", Oriental longmans Ltd, New Delhi, 1980.
2. Denlkar, "Household Textiles & laundry work", Atma Ram & Sons, Delhi, 1993.

**AIM**

To use Computer and relevant software to develop and design patterns for Garments

**LIST OF EXPERIMENTS**

Developing design, pattern and marker plan for children's wear – Baby frock using a one-way fabric of 38" & 42" width. Calculate the marker efficiency.

Developing design, pattern and marker plan for children's wear – Rompers using a two-way fabric of 38" & 42" width. Calculate the marker efficiency.

Developing design, pattern and marker plan for a Ladies top –using corduroy fabric of 44" & 52" width. Calculate the marker efficiency and develop a lay lot plan.

Developing design, pattern and marker plan for Men's Formal Trouser – using a pencil stripe fabric of 60" & 72" width. Calculate the marker efficiency.

Developing design, pattern and marker plan for a Ladies Skirt –using plaid fabric of 38" & 60" width. Calculate the marker efficiency. Develop a lay lot plan

Developing design, pattern and marker plan for a Men's Full arm shirt using a checks fabric of 52" & 60" width. Calculate the marker efficiency. Develop a lay lot plan

Designs a ladies party wears including accessories and develop a 3 D visual merchandise window display

Design a Men's Formal wear including accessories and develop a 3 D visual merchandise window display

Design Children wear including accessories and develop a 3 D visual merchandise window display

**TOTAL: 45 PERIODS**

**COMPUTER AIDED GARMENT DESIGN LAB****LIST OF EQUIPMENTS**

**(For a batch of 30 Students)**

Pattern Drafting, Grading and Marker Planning Software – 30 Copies

|                                    |                   |        |
|------------------------------------|-------------------|--------|
| <b>Fashion Designing Software:</b> | 1. Fashion Studio | 1 Copy |
|                                    | 2. Textronics     | 1 copy |
|                                    | Karat Cad         | 1 Copy |

|               |   |                           |        |
|---------------|---|---------------------------|--------|
| <b>Module</b> | : | <b>Fashion Studio</b>     | 1 Copy |
|               |   | Design & Repeat           |        |
|               |   | Colour Reduction          |        |
|               |   | Story Board & Cataloguing |        |

|                          |   |            |
|--------------------------|---|------------|
| <b>General Soft Ware</b> | : | Adobe      |
|                          |   | Corel Draw |

Any one 15 Copies

Illustrator

|                                |   |   |
|--------------------------------|---|---|
| <b>Hardware Specifications</b> | : | 30 Nos  |
|                                |   | (With Suitable configuration to support the Software) |

Plotter & Scanner - 1 each

Spreading & Cutting machine - lab Model (Preferable) - 1 each



**AIM:**

To impart knowledge on Garment making

**OBJECTIVES:**

- To teach the students about types of seams and stitches, sewing threads and their qualities
- To impart knowledge on various garment parts and their variations.
- To impart knowledge on use of accessories for garments

**LIST OF EXPERIMENTS**

Step by step construction of Ladies Salwaar  
 Step by step construction of Ladies Kameez  
 Step by step construction of Ladies top (2 sessions)  
 Step by step construction of Ladies Blouse (2 sessions)  
 Step by step construction of Ladies trouser (2 sessions)  
 Step by step construction of Ladies Brassiers  
 Step by step construction of Ladies Panties

**TOTAL: 45 PERIODS**

**GARMENT CONSTRUCTION LAB II****MACHINES REQUIRED**

**(For a 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  | - | 1each         |
| Cylinder bed Sewing machines              | - | 1(Preferable) |
| Collar & Cuff recessing machine           | - | 1(Preferable) |

**CONSUMBALES:**

**(To be brought by students)**

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

**AIM:**

To understand fashion forecasting and develop suitable garments

**OBJECTIVES:**

To understand Fashion Forecasting in terms of colour, pattern and Fabric

- To learn preparation of Story board
- To learn selection of Design details, fabric and accessories
- To develop Miniature garments

**TOTAL: 45 PERIODS****EXPERIMENTS**

Forecasting colours, pattern and fabric for the ensuing seasons based on international forecast

Collections of fabric swatches and colours based on future forecast

Preparation of story boards/Mood boards

Illustrating Fashion Models

Selection of Fabric Swatches

Selection of Surface Ornamentation techniques

Preparation of various Styles for Selected fabrics

Selection of Seams, Necklines, Collars, Sleeves etc

Selection of Accessories

**OBJECTIVE**

Knowledge on the principles of management is essential for all kinds of people in all kinds of organizations. After studying this course, students will be able to have a clear understanding of the managerial functions like planning, organizing, staffing, leading and controlling. Students will also gain some basic knowledge on international aspect of management.

**UNIT I OVERVIEW OF MANAGEMENT 9**

Organization - Management - Role of managers - Evolution of Management thought - Organization and the environmental factors - Managing globally - Strategies for International Business.

**UNIT II PLANNING 9**

Nature and purpose of planning - Planning process - Types of plans – Objectives - - Managing by objective (MBO) Strategies - Types of strategies - Policies - Decision Making - Types of decision - Decision Making Process - Rational Decision Making Process - Decision Making under different conditions.

**UNIT III ORGANIZING 9**

Nature and purpose of organizing - Organization structure - Formal and informal groups / organization - Line and Staff authority - Departmentation - Span of control - Centralization and Decentralization - Delegation of authority - Staffing - Selection and Recruitment - Orientation - Career Development - Career stages – Training - - Performance Appraisal.

**UNIT IV DIRECTING** **9**  
Creativity and Innovation - Motivation and Satisfaction - Motivation Theories Leadership  
- Leadership theories - Communication - Hurdles to effective communication -  
Organization Culture - Elements and types of culture - Managing cultural diversity.

**UNIT IV CONTROLLING** **9**  
Process of controlling - Types of control - Budgetary and non-budgetary control  
techniques - Managing Productivity - Cost Control - Purchase Control - Maintenance  
Control - Quality Control - Planning operations.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Stephen P. Robbins and Mary Coulter, 'Management', Prentice Hall of India, 8th edition.
2. Charles W L Hill, Steven L McShane, 'Principles of Management', Mcgraw Hill Education, Special Indian Edition, 2007.

**REFERENCES**

1. Hellriegel, Slocum & Jackson, ' Management - A Competency Based Approach', Thomson South Western, 10th edition, 2007.
2. Harold Koontz, Heinz Wehrich and Mark V Cannice, 'Management – A global & Entrepreneurial Perspective', Tata Mcgraw Hill, 12<sup>th</sup> edition, 2007.
3. Andrew J. Dubrin, 'Essentials of Management', Thomson Southwestern, 7th edition, 2007.

**FT2401** **WORK STUDY IN APPAREL PRODUCTION** **L T P C**  
**3 0 0 3**

**AIM**

To impart knowledge on productivity and work study methods and their application

**OBJECTIVES:**

- To impart knowledge on productivity and factors affecting productivity
- To impart knowledge on work study methods and their application in Apparel industry

**UNIT I** **9**  
Productivity in industry Productivity and standards of living Productivity of materials,  
productivity of land, buildings, machineries and Manpower Total time to do a job Factors  
tend to reduce productivity, work content and time. Reducing work content due to the  
product, due to the process method, reducing ineffective time, due to management, due  
to the worker

**UNIT II** **9**  
Work – study: Definition, work-study and productivity, Base procedure of work-study.  
Work study and the management. Work-study and the supervisor, Work-study and the  
worker, work-study, working condition and the working environment

**UNIT III** **9**  
Method study: definition and objects of method study. Basic procedure, selection of  
work, Recording, examining, development of method Factory lay out and movement of  
workers and material. String diagram, Man type flow process chart, multiple activity  
chart, travel chart. Principle of motion economy classification to movements Two-handed  
process chart, micro motion study, SIMO chart, Define, installs and maintain improved  
method.

**UNIT IV** **9**

Work measurement: Definition, purpose, procedure and uses. Techniques of work measurement Work sampling: need and use time study: definition, basic time study equipment. Time study forms, selecting the job, steps in making a time study breaking the job into elements: Sample size, timing card element: stop watch procedure. Time Study rating, calculation of standard time, setting time standards for work with machineries

**UNIT V** **9**

Application of work study techniques in cutting, stitching and packing in garment industry Comparative study of different manufacturing systems used in the garment production – group system, batch system- industrial system

**TOTAL: 45 PERIODS**

**TEXT BOOKS:**

1. Johnson Maurice “Introduction of Work Study”, International labour Organization, Geneva, 1995
2. Jacco Solinger “Apparel Manufacturing Hand Book”, Reinhold Co, 1998.

**REFERENCES:**

1. Kantilal Ila, “Apparel Industry In India”, Prentice Hall, 1990.

**TT2082**

**TEXTILE COSTING**

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

**AIM**

To impart knowledge on principles of Apparel costing and factors affecting cost.

**OBJECTIVES**

- To impart knowledge on elements of apparel cost and factors affecting cost.
- To educate on principles of cost estimation and actual cost

**UNIT I** **9**

Estimating, aims of estimating – costing, aims of costing – difference between estimating and costing – types of estimates.

**UNIT II** **9**

Elements of cost – material cost – labour cost, Different types of expenses – cost of product – advertisement cost, - going rate pricing. Selling cost. Pricing, full cost pricing, marginal cost pricing.

**UNIT III** **9**

Analysis of over head expenses: introduction – factory expenses – administrative expenses – selling and distribution expenses – allocation of over head expenses – depreciation – reasons for depreciation – methods of calculating depreciation – simple problem.

**UNIT IV** **9**

Costing of garments; factors that determine the price of garments – material cost – cost of yarn, cost of fabric production, cost of processing width of fabric, and design affecting cost – lot size, and cost of components – cutting cost – making and trim cost (CMT cost). Simple problems

**UNIT V** **9**

Packing & labeling cost – different types and functions Uses of brand and size label – duty draw back etc. cost of bought out components, thread, Button, Zippers, Interlining, Shipment cost, cost calculation of ladies, Men and children’s wear – woven and knitted – simple problems.

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. Johnson Maurice, E. Moore, “Apparel Product Development”, Om Book Service, 2001.
2. Katherin McKelvy, “Fashion Source Book”, Om Book Service, 2001.

|               |   |                            |
|---------------|---|----------------------------|
| <b>TT2351</b> | <b>QUALITY ASSURANCE IN FABRIC MANUFACTURE<br/>AND GARMENT PRODUCTION</b> | <b>L T P C<br/>3 0 0 3</b> |
|---------------|---|----------------------------|

**AIM**

To educate the students the concept of Quality assurance in various departments in apparel manufacturing

**OBJECTIVES**

- To impart knowledge on quality control and quality assurance, sampling and inspection techniques
- To impart knowledge on quality assurance for each department in apparel manufacturing

**UNIT I** **9**

Introduction – Quality definition – Quality control and its necessity – inspection and importance – functions of inspection – systems of inspection- types of inspection – hundred percent inspection – sampling inspection – comparison of 100% inspection & sampling inspections. AQL standards Quality assurance - Difference between quality assurance and quality inspection.

**UNIT II** **9**

Quality standards, statistical quality control charts – control charts, its applications – sampling –its importance & use of sampling techniques. ISO 9000 Total quality management, quality circles. SA –8000

**UNIT III** **9**

Types of control forms – basic production systems – Principles for choosing a production system – evaluating systems –flow process and grid charts – basic flow process grid construction – flow process grid for production control – scheduling calculations graph method – schedules for producing many styles simultaneously – producing many styles continuously in one line.

**UNIT IV** **9**

Quality control for fabrics – different types of defects in fabrics – major and minor faults – fabric inspection system Quality control in pattern making, grading, marking and marker efficiency – Quality control in stitching and production analysis – co-coordinating department activities – Distribution of tickets & maintenance of records establishing merchandising standards. The quality control of trims accessories

**UNIT V** **9**  
Tolerance and quality standard for fabrics, processing, cutting, stitching in garment industry, tolerances and quality standard for finished garments. Quality control system and standards for packing and packed goods, warehousing & shipping – cost of quality conformance- cost of non-conformance.

**TOTAL: 45 PERIODS**

**TEXT BOOKS**

1. Grover E G and Hamby D. S " Hand Book of Textile Testing and Quality Control", Wiley Eastern Pvt. Ltd., New Delhi, 1969.
2. Jacco Solinger, "Apparel Manufacturing Handbook", Prentice Hall, 1993

**REFERENCE**

1. Sammel Eliou, "Production Planning & Control", Wiley Eastern Pvt. Ltd..

**FT2404** **COMPUTER APPLICATION IN APPAREL INDUSTRY** **L T P C**  
**3 0 0 3**

**AIM**

To impart knowledge on application of CAD / CAM techniques in Apparel Industry

**OBJECTIVES**

- To impart knowledge on CAD / CAM applications in Apparel designing and manufacturing
- To impart knowledge on Computer application in Apparel Production Planning and Control

**UNIT I** **9**  
Computer basics – computer specification – input/output device- concept of Internet, Web & their application in garment industry. CAA – Computer Aided Administration, CAD- Computer Aided Designing, CAM- Computer Aided Manufacturing, CIM- Computer Integrated Manufacturing.

**UNIT II** **11**  
Pattern making and grading using apparel software and digitizer marker efficiency. Concept of Computer application in fabric defect checking – computerized fabric laying – cutting – sorting & labeling machines

**UNIT III** **9**  
Computer application in sewing embroidery and garment design computer aided color matching – computer controlled overhead transport & warehouse storage systems. Computerized unit production systems used in apparel industry.

**UNIT IV** **7**  
Concept of electronic based smart garments, use of graphics for fabric and a garment designs product designs, color work on CAD system for printing

**UNIT V** **9**  
E-Commerce in apparel industry – ERP, concept of ERP and its application in garment unit – Electronic data interchange – computer aided management and production control

**TOTAL: 45 PERIODS**

**TEXT BOOKS:**

1. Winfred Aidrich, "CAD in Clothing and Textiles", Blackwell Science Ltd., 1994.
2. Patric Taylor, "Computer in the Fashion Technology", Om Book Service, 1997.

**FT2407**

**MINI PROJECT & DESIGN COLLECTION**

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

**AIM**To practice use of fashion forecasting to develop garments.

**OBJECTIVITIES**

- To develop Miniature garments using fashion forecasting and design collection.
- To understand documentation of "garment design" along with costing.

**EXPERIMENTS**

Preparation of Miniature garments as per the design collection (FT1357)

Preparation of costing sheet for each garment designed

Documenting the Design Collection in suitable format and Final Presentation

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

**TOTAL : 45 PERIODS**

**FT2408**

**APPAREL MACHINARY LAB**

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

**LIST OF EXPERIMENTS**

Study of Threading and Stitches per inch in single Needle Lock Stitch Machine.

Study of Threading and stitches per inch over lock stitch machine.

Adjustment of needle thread & Lopper thread tension and feed ratio in over lock stitch machine.

Study of threading and stitches per inch Flat lock stitch machine.

Adjustment of needle thread & Lopper thread tension and feed ratio in Flat lock stitch machine.

Study of button sewing machine

Study of Button Holing machine

Study of Feed of the arm Machine.

Study of Flat lock elastic attaching machine

Study of Electronic Zig – Zag Sewing machine.

**LIST OF EQUIPMENTS**

**(For a Batch of 30 students)**

|  |   |      |
|--|---|------|
| Single Needle Lock Stitch machine      | - | 30   |
| Over lock Stitch machine.              | - | 1 No |
| Flat lock Stitch machine               | - | 1 No |
| Button sewing machine.                 | - | 1 No |
| Button Holing machine.                 | - | 1 No |
| Feed of he arm machine.                | - | 1 No |
| Flat lock elastic attaching machine. - | - | 1 No |
| Electronic Zig- Zag Sewing machine.    | - | 1 No |

**TOTAL : 45 PERIODS**

**GE2022 TOTAL QUALITY MANAGEMENT L T P C  
3 0 0 3**

**UNIT I INTRODUCTION 9**

Introduction - Need for quality - Evolution of quality - Definition of quality - Dimensions of manufacturing and service quality - Basic concepts of TQM - Definition of TQM – TQM Framework - Contributions of Deming, Juran and Crosby – Barriers to TQM.

**UNIT II TQM PRINCIPLES 9**

Leadership – Strategic quality planning, Quality statements - Customer focus – Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Employee involvement – Motivation, Empowerment, Team and Teamwork, Recognition and Reward, Performance appraisal - Continuous process improvement – PDSA cycle, 5s, Kaizen - Supplier partnership – Partnering, Supplier selection, Supplier Rating.

**UNIT III TQM TOOLS & 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 & TECHNIQUES II 9**

Quality circles – Quality Function Deployment (QFD) – Taguchi quality loss function – TPM – Concepts, improvement needs – Cost of Quality – Performance measures.

**UNIT V QUALITY SYSTEMS 9**

Need for ISO 9000- ISO 9000-2000 Quality System – Elements, Documentation, Quality auditing- QS 9000 – ISO 14000 – Concepts, Requirements and Benefits – Case studies of TQM implementation in manufacturing and service sectors including IT.

**TOTAL : 45 PERIODS**

**TEXT BOOK**

1. Dale H.Besterfiled, et at., “Total Quality Management”, Pearson Education Asia, Third Edition, Indian Reprint (2006).

**REFERENCES**



1. James R. Evans and William M. Lindsay, "The Management and Control of Quality", (6<sup>th</sup> Edition), South-Western (Thomson Learning), 2005.
2. Oakland, J.S. "TQM – Text with Cases", Butterworth – Heinemann Ltd., Oxford, Third Edition (2003).
3. Suganthi,L and Anand Samuel, "Total Quality Management", Prentice Hall (India) Pvt. Ltd. (2006)
4. Janakiraman,B and Gopal, R.K, "Total Quality Management – Text and Cases", Prentice Hall (India) Pvt. Ltd. (2006)

**FT2021**

**FASHION PHOTOGRAPHY**

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

**AIM**

To impart knowledge on different photography techniques and equipments. To impart knowledge on different printing techniques.

**OBJECTIVE**

- 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**

**9**

Photography – Basics – General principle- Rules – indoor Photography – Needs and methods lighting techniques for indoor photography – methods and equipment's – advantage and disadvantages – out door photography – methods – lighting techniques – methods and equipments – comparison of outdoor photography with indoor photography.

**UNIT II**

**9**

Camera definition – parts of camera- classification and types of camera – Applications Disadvantages.

**UNIT III**

**9**

Photography techniques and equipment for different fields. Modeling, newspaper, magazines –occasions –Fashion shows.

**UNIT IV**

**9**

Developing – Definition – Different techniques in developing. Printing – definitions – Methods of printing for black & white color.

**UNIT V**

**9**

Photography using digital cameras – Video photography – image mixing – application of computers in photography.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. W.R. Miller, "Basic Industrial Arts, Plastics, Graphics Arts, Power Mechanics, Photography", McKnight Publishing Company, Illionois, 1978.
2. John Hedge, "Photography Course", John Hedge Co, 1992.

**FT2022**

**CAD IN FASHION & TEXTILE**

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

**AIM** To impart knowledge on application of software for fashion and textile design

**OBJECTIVE**

- To teach students about selection and use of software for fabric and garment design.

**UNIT I** **9**

Selection of software, different software available for textile designing and fashion designing. Important of design using CAD. Special tools & Skills & program application for lines drawing & images using software like Corel draw & photo shop.

**UNIT II** **9**

Study of features & working of textile designing software. Developing designs for dobby, jacquard, knit & printing. Weave terms, sample swatch card, categorizing fabrics.

**UNIT III** **9**

Current use of fashion designing software in industry & designing field, creating a basic pattern motif, editing a basic motif, creating a toss repeat, color selection, working with color, color edition, rendering textures & lighting, 3D-Simulation – story board & cataloging.

**UNIT IV** **9**

Developing garment designs for men's, women's & children's fashion figures along with accessories, developing a design library of garment details.

**UNIT V** **9**

Use of CAD, graphic designs, principles, 3D-studio max- making design portfolio & catalog.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Colussy Kathleen, "Fashion Design on computers", Prentice hall, 2001.
2. Patric Taylor, "Computer in the Fashion Technology", Om Book Service, 1994.

**REFERENCE**

Winfred Aldrich, "CAD in Clothing & Textiles", Blackwell science Ltd., 1994.

**FT2023**

**MANAGEMENT OF APPAREL UNITS**

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

**AIM**

To impart knowledge on enterprise development, labour laws and marketing principles applied to apparel Industry.

**OBJECTIVE**

To equip the students with the organizational structure of apparel Industry in India.  
To teach entrepreneurship, Labour law and marketing principles.

**UNIT I** **9**

Classification of garment units – wovens – knit garments – lingerie – Leather garment – sports wear – outer wear – under garments – hospital wear and Industrial Garment – Entrepreneurship – Entrepreneurship development skills – concept of small scale industry – advantages of SSI units.

**UNIT II** **9**  
Setting up a small garment unit - study of land, Norms of SA-8000, capital, labour market demand etc. preparing a project, large scale industry its advantages over SSI. Bank assistance, marketing – national & international marketing.

**UNIT III** **9**  
Labour – Study of labour laws –factory act – labour laws – welfare measures – safety act – eco – friendly textiles.

**UNIT IV** **9**  
Market – study of markets for raw materials and markets for finishing products – local markets – international markets. Spring /summer –Autumn /winter seasons effecting fashion trends.

**UNIT V** **9**  
Exports policy – trade documentation and quota policy – AEPC and its role in the garments industry. Advertising – different media – trade fare- display – exhibition fashion shows – buyer – seller meet.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. R.K.Sharma, “Development banks & Entrepreneurship promotion in India”, Mital publications, New Delhi.
2. O.P Khanna, “Industrial engineering & Management”, Dhanpat Rai Publications (p) Ltd., New Delhi.

**FT2024**

**FASHION MARKETING**

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

**AIM**

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

**OBJECTIVE**

- To educate about principles of marketing, factors affecting domestic and international market, fashion trends and consumer behaviour.

**UNIT I** **9**  
Definition of Fashion- Fashion marketing – Development of Fashion market – Size Structure – marketing requirement- Fashion Buyer – Consumer influence on market.

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

**UNIT III** **9**  
Applied illusions – Physical effects- Overall height- over all weight – Covering body defects by design – Visual design in Dress in Australia - Brazil – Germany - India – Japan - Nigeria.

**UNIT IV** **9**

Fashion marketing Research – Purpose of research -research design & data sources – Sampling methods – data Collection – Forecasting Fashion – Market Segmentation - Fashion marketing mix.

**UNIT V** **9**

Fashion Products and its importance – Fashion Industry & new Product Development – Fashion Designers role in apparel market – Branded Products – personal labels – stores that seek the merchandise.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Mike Easey, “Fashion Marketing”, Blackwell Science, 2000.
2. Maurice J.Johnson & Evelyn C.moore, “Apparel Product Development”, Prentice Hall Inc., 2001.

**REFERENCES**

1. Marian L. Davis, “Visual Design in Dress”, Prentice Hall Inc., 1976.
2. Elaine Stone,” Fashion Merchandising”, Blackwell Science Ltd., 2000.

**FT2025**            **COMPUTER AIDED PATTERN MAKING (CAPM) FOR MEN’S AND  
WOMEN’S WEAR** **L T P C  
3 0 0 3**

**AIM**

To impart knowledge on Techniques and software for pattern making and their application to men’s and women’s wear.

**OBJECTIVE**

- To teach techniques of computer aided pattern making.
- To teach pattern making for men’s and women’s wear using software

**UNIT I** **9**

Selection of software – Flexibility, upgradability, ease of use- Documents etc. the software, selection of hard ware – configuration selection – software compatibility.

**UNIT II** **9**

Simulation techniques, Solid modeling shading –drafting using AutoCAD with special reference to apparel– pattern making laying of material.

**UNIT III** **9**

Using CAD to identify grain – grain line – notches – true bias – seam allowance- cut mark – pocket mark etc. take body measurements of Men’s & Women’s garments and create pattern using CAD. Create the surface design techniques using CAD.

**UNIT IV** **9**

Creating patterns with CAD for Men’s & Women’s Wear, Pattern making – grading – marker efficiency – using CAD. Computer aided colour matching.

**UNIT V** **9**

Solving fitting problems of Men’s & Women’s garments using CAD. Principles of a good fit; alteration of pattern for defective figures – Develop patterns using CAD for Men’s & Women’s Wear – Shorts – Trousers Chinoo – Shirts (2 types) SB Coat, DB Coat.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Gerry Cooklin, "Master Patterns and grading for women's out size", Blackwell Science, 1995.
2. Winifred Aldrich, "Metric Pattern cutting for Men's Wear", Om Book service, 1997.

**REFERENCES**

1. Gerry Cooklin, "Pattern grading for Children's cloths", Blackwell Science, 1996

**FT2026 CREATIVITY, INNOVATION, AND NEW PRODUCT DEVELOPMENT**

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

**AIM**

To impart knowledge on product creation, evaluation and costing techniques

**OBJECTIVE**

- To impart knowledge on the concept of product design and development
- To impart knowledge on feasibility and evaluation of new product.
- To impart knowledge on proto type creation and testing. Patent laws.
- To educate on market research.

**UNIT I INTRODUCTION 9**

The process of technological innovation –factors contributing to successful technological innovation – the need for creativity and innovation – creativity and problem solving – brain storming- different techniques.

**UNIT II PROJECT SELECTION AND EVALUATION 9**

Collection of ideas and purpose of project – selection criteria – screening ideas for new products (evaluation techniques).

**UNIT III NEW PRODUCT DEVELOPMENT 9**

Research and new product development – Patents – patent search – patent laws – International code for patents – intellectual property rights (IPR).

**UNIT IV NEW PROJECT PLANNING 9**

Design of proto type- testing – quality standards – marketing research – introducing new products.

**UNIT V MODEL PREPARATION & EVALUATION 9**

Creative design – Model Preparation – testing – Cost evaluation – Patent Application.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Harry Nystrom, "Creativity and Innovation", John Wiley & Sons, 1979.
2. Jacob Solinger, "Apparel Manufacturing Handbook", Reinhold Publications, 1998.

**REFERENCES**

1. Brain Twiss, "Managing Technological Innovation", Pitman Publishing Ltd., 1992.
2. Harry B. Watton, "New Product Planning", Prentice Hall Inc., 1992.

**AIM**

To educate the students in techniques and machinery for dyeing and finishing of garments.

**OBJECTIVE**

- To equip the students with the knowledge of dyeing techniques for apparel
- To equip the students with the knowledge of applying different finishes on garments

**UNIT I****12**

Garment dyeing: Fabric and sewing thread selection, accessories selection, dye selection, garment-dyeing machinery.

**UNIT II****12**

Washing: Stone washing, acid washing, enzyme washing, bio polishing, emerisation, bleaching, laser fading and ozone fading.

**UNIT III****12**

Finishing: Optical brightening, mercerization, liquid ammonia, treatment, stiffening, softening, crease resistant and crease retentive finish, anti-static finish, anti-bacterial finish, water proofing, flame proofing, soil release finish, mildew and moth proofing.

**UNIT IV****9**

Stain removal – Oil, colour matter, chemicals. Use of care labels and standards / norms for care labels. Garment laundering equipments and procedures.

**TOTAL : 45 PERIODS****TEXT BOOKS:**

1. Harrison. P (Editor), "Garment Dyeing: Ready to wear fashion from the dye house", The Textile Institute, U.K. 1988) ISBN: 1870812131
2. Noemia D' Souza., "Fabric Care", New Age International (P) Ltd. Publisher, Chennai, 1998, ISBN: 81-224-1143-6.

**REFERENCES**

1. Marsh, J.T., "An Introduction to Textile Finishing", Chapman and Hall Ltd., London, 1979.
2. Shenai, V.A., "Technology of Textile Finishing", Sevak Publications, Bombay, 1995.
3. Hall, A.J., "Textile Finishing" Elsevier Publishing Co. Ltd., 1986.

**AIM**

To impart knowledge on application of CAD / CAM in apparel industry

**OBJECTIVE**

- To educate the students the use of computer based systems in various activities of apparel industry – garment design, pattern making, grading and marker planning

- To educate the students on the concept of computer aided manufacturing, production planning and control
- To equip the students with knowledge of application of computer based management systems.

**UNIT I** **9**

Introduction to computer – Concepts of CAD / CAM. Applications of CAD / CAM in apparel industry. Effectiveness of using CAD / CAM in Apparel production and enterprise management.

**UNIT II** **9**

Concept of computerized pattern making – selection of hardware and software, a sample pattern. Computer aided manipulation of pattern pieces to create individual styles, grading and marker planning. Application of garment design CAD software. Computer application in purchase, inventory control and sales, computerization in quality control and production control.

**UNIT III** **12**

Computer aided production planning in Garment Manufacturing. Introduction to finite scheduling concept and fast reading software. Creating product and order planning, updating. Eliminate late deliveries – General set up, allowances and matrices – Analyzing line balancing in different departments – control mechanisms – critical path and time tables.

**UNIT IV** **9**

Computer controlled machinery for garment manufacturing – automated layout planning by various techniques – Algorithm for computerised production of garment parts – 3D scanning for body measurements. Imaging techniques for various designs. Development of robotics for CAM.

**UNIT V** **6**

Management Information System in garments Industry – EDI in garment technology. Concept of Enterprise Resource Planning (ERP) and computerization in exports / documentation.

**TOTAL : 45 PERIODS**

**TEXT BOOKS:**

1. Stephen Gray “CAD / CAM in clothing and Textiles” Gower Publishing Limited, 1998, ISBN 0-566-07673X.
2. W.Aldrich, “CAD on Clothing and Textiles”, Blackwell Science, 2<sup>nd</sup> Edition, 1992, ISBN: 0-63-3893-4

**REFERENCES**

1. Compilation of papers presented at the Annual world conference Sep 26 – 29, 1984 Honking, “Computers in the world of textiles”, The Textile Institute. ISBN: 0-0900739-69X

**FT2029 APPAREL MERCHANDISING & MARKETING**

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

**UNIT I** **9**

Organisation of apparel industry – nature of apparel industry – types of apparel industry – Business concepts applied to apparel industry. Dynamics of Fashion – Effect of environment, people, economy on fashion. Principles of Fashion – Style, distinctive

characteristics – Fashion cycle. Product development – timing and product presentation  
Role of Designers.

**UNIT II** **9**

Apparel merchandising – definition, scope, functions. Functions of merchandiser. Principles of merchandising. Types of merchandising – Visual merchandising – Effect of consumer – Types of buyers – communication with buyers and consumers.

**UNIT III** **9**

Forecasting – Awareness of market trends – Product development – product mix, factors affecting product mix, factors influencing change in product mix. Trend forecasting and auxiliary services. Purpose of forecasting trends. How to use forecasting services. Trade fairs and fashion shows for forecasting.

**UNIT IV** **9**

Sourcing – definition, need for sourcing, methods of sourcing. Sourcing for raw material, sourcing for accessories – linings, buttons, zippers, labels etc.  
Manufacturing Resource Planning – Principles of manufacturing resource planning – supply chain – demand chain analysis – material management for quick response – Just in Time (JIT) Technology.

**UNIT V** **9**

Apparel Marketing – definition, scope functions, Marketing strategies – market research – Types of markets – Retail and Wholesale markets. Domestic and International markets – Factors influencing domestic and international markets.  
Designer labels, chain stores, brand marketing.  
Advertising – purpose, methods. Types of advertising. Types of advertising media. Sales promotion methods. Trade fairs and fashion shows as sales promotion techniques.  
Communication – effective communications, communication with buyers and consumers. Feedback to production and marketing departments. Use of computers as a tool for effective merchandising.

**TOTAL = 45 PERIODS**

**TEXT BOOKS**

1. J.Jarnow & K.G. Dickerson “Inside the Fashion Business”, Prentice Hall, 1997.
2. Swiney, John B, “Merchandising of Fashion”, Ronald Press, 1942.

**REFERENCES**

1. Shivaramu.S., “Export Marketing – A Practical Guide to Exporters”, Wheeler Publishing, 1996.
2. Carr, H.C., “The Clothing Factory”, The Clothing Institute, London, 1972.
3. Mike Easey, “Fashion Marketing”, Blackwell Science, 2000.
4. Stephen, Gini, “Fashion Concept to Concept to Consumer”, McGraw Hill, 1998.

**FT2031**

**OPERATIONAL RESEARCH**

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

**AIM**

To use OR principles in developing project engineering schedule and network of project constructions.

**OBJECTIVES:**



- To Find solution to the correct route in implementing the projects.

**UNIT I** **10**  
 Linear Programming: Formulation of LP problem: Solution of LP problem by graphical method, simplex method.

**UNIT II** **11**  
 Transportation problem: Northwest corner rule, inspection method, Vogle Approximation method. Application of optimality test. Inventory Control: ABC analysis; Fixation of inventory level, EOQ (Wilson’s Formula), Problems related to above theoretical aspects.

**UNIT III** **12**  
 PERT / CPM: Drawing of CPM and PERT networks, finding critical path. Project cost control, determining the value of z- variate in the case of PERT networks, S.D, variances etc.

**UNIT IV** **12**  
 Game theory; Rule of Saddle point determination, Rule of dominance, Mixed strategy approach, Graphical Approach, Problems related to above theoretical aspects.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. J. Heizer, B.Render., “Production and Operations Management”, Prentice Hall (1993), ISBN: 0-205-14048-3.
2. Hamdy A. Taha, “Operations Research an introduction”, Macmillan Publishing Company, New York, Third Edition, 1982.

**REFERENCES**

1. Hamdy A. Taha, “An introduction to Operations Research”, Macmillan Publishing Company, New York, Fifth Edition, 1996
2. Narayan Bhat U, “Elements of Applied Stochastic processes” John Wiley and Sons, 1972.
3. Frederick S. Hiller and Gerald J. Liberman, “Introduction to Operations Research”, McGraw-Hill, Industrial Engineering Series, International edition, 1995.

**TT2041      APPAREL PRODUCT ENGINEERING AND PLANT LAYOUT      L T P C**  
**3 0 0 3**

**AIM**

To impart knowledge on techniques of product and production process analysis and control

**OBJECTIVE**

- To impart knowledge on product analysis with respect to quality, standards and cost.
- To impart knowledge on production process evaluation, control and manufacturing information systems work study.

**UNIT I** **6**  
 Product analysis; Relationship between quality and construction of a seven product – geometric principles of draping, drafting and industrial patterns – product specifications.

**UNIT II** **8**  
Production control and Engineering; Industrial engineering concepts – Development and application of standard data for pre-costing and factory scheduling – Basic production systems – production control charts. Manufacturing Information system; Systems and procedures.

**UNIT III** **10**  
Production Management analysis; Analysis of techniques for material utilization and cutting of raw materials for all types of sewn products principles and methods of costing, evaluation production problems in spreading, cutting and cost control.

**UNIT IV** **11**  
Plant Layout; Definition – Types of production layout, criteria for evaluation of a plant layout, determining minimum space requirement, calculation grid, plant size location, Basic production fine layout, Government regulations for plant layouts.

**UNIT V** **10**  
Time and motion study; General approach for making a time and motion study, preliminary data for time and motion study sheet; sewing work study, Principles of work cycle timing methods, objectives of time study, statistical approaches – statistical calculation of time study – operator efficiency distributions. Evaluating motion study data – Principles for improving sewing and pressing operations.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Jacob Solinger, "Apparel Manufacturing Handbook", VanNostrand Reinhold Company (1980)
2. Bethel, Tann, Atwater and Rung, "Production Control" McGraw Hill Book Co., New York, (1948)

**REFERENCES**

1. Biegel, John. E., "Production Control – A Quantitative Approach" Prentice Hall Inc. (1971) wnd edition.
2. Immer, John. R., "Layout Planning Techniques" McGraw-Hill, New York, (1950)
3. Barnes, Ralph M., "Motion and Time Study", John Wiley and Sons, New York., (1958)

**FT2033**

**ECO FRIENDLY DYES AND CHEMICALS**

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

**AIM**

To impart the knowledge of pollution, policies, detection of hazardous dyes and chemicals and their eco friendly alternatives.

**OBJECTIVE**

- To impart knowledge on chemical constitution of dyes and chemicals used in apparel industry
- To impart knowledge on detection of hazardous chemicals, legislation banning them, allowances and eco friendly alternatives.

**UNIT I** **12**  
Constitution of dyes and finishing agents – German legislation – list of banned dyes – azo dyes – benzene dyes – parachlorophenol.

|  |           |
|--|-----------|
| <b>UNIT II</b>   | <b>12</b> |
| Alternative dyes and chemicals – structure – Identification by chromatographic techniques.         |           |
| <b>UNIT III</b>  | <b>9</b>  |
| Finishes – banned items – allowable dosages – alternatives to finishes                             |           |
| <b>UNIT IV</b>   | <b>12</b> |
| Dye cleaning agents – pigments – bleaching agents – solvents – guidance to dyestuff manufacturers. |           |

**TOTAL : 45 PERIODS**

**TEXT BOOK**

1. Are Textiles Finishing the environment? Textile Inst., Manchester, 1990
2. Finishers and the environment – solutions, Textile Inst., Manchester, 1993.

**REFERENCES**

1. Reife A and Freeman H.,S., Environmental Chemistry of dyes and pigments, Wiley, 1996, ISBN : 0471589276

|               |                         |                |
|---------------|-------------------------|----------------|
| <b>FT2035</b> | <b>CLOTHING SCIENCE</b> | <b>L T P C</b> |
|               |                         | <b>3 0 0 3</b> |

**AIM**

To impart the knowledge on testing fibre, yarn, fabric and garment for various utility properties.

**OBJECTIVE**

- To impart knowledge on effect of physical and chemical properties of fiber, yarn, fabric and garments on apparel utility characteristics – appearance, comfort, durability, protection and care.

|                   |          |
|-------------------|----------|
| <b>UNIT I</b>     | <b>9</b> |
| Fabric Appearance |          |

Fibre structure, selection of fibre, yarn structure and fabric construction; their effect on fabric appearance. Study of properties such as pilling, fastness, and luster.

|                |          |
|----------------|----------|
| <b>UNIT II</b> | <b>9</b> |
| Comfort        |          |

The effect of fibre properties, yarn structure and fabric construction on the fabric properties such as drapability, air permeability, Moisture absorption, bending rigidity, shear rigidity, selection of fibres and yarn structure and its effect on comfort properties, effect of fabric construction.

|                 |          |
|-----------------|----------|
| <b>UNIT III</b> | <b>8</b> |
| Durability      |          |

Study of Tensile, tearing strength, bursting strength with respect to fibre properties, yarn structure and fabric design.

|                       |          |
|-----------------------|----------|
| <b>UNIT IV</b>        | <b>4</b> |
| Fabric as Protection. |          |

Study of protective properties of apparel for various applications. Desirable properties of protective textiles – method of testing for thermal protective performance, abrasion and wear resistance, evaluation of resistance to mildew, ageing, sunlight, chemical,

electrostatic and electrical resistivity, impact properties. Testing for flame retardancy. ASTM standards for protective garments.

**UNIT V** **6**

Easy care

The fibre properties and chemical treatments that decide the fabric properties such as crease recovery, shrink ability, pilling formation.

**UNIT VI** **9**

Fabric Engineering

For the given end use, designing of fabric from selection fibre, type of yarn manufacture, fabric design to finishing treatments.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Morton W.E. and Hearle, J.W.S., "Physical Properties of Textile Fibres", The Textile Institute, England, 1993.
2. Meridith.R, "Mechanical Properties of Textiles Fibres", North Holland, Amsterdam 1986.

**REFERENCES**

1. Hearle.J.W.S. Grosberg.P and Backer.S, "Structural Mechanics of Fibres, yarn and Fabrics', Vol.1, wiley-intersciences, New York, 1969.
2. Goswami B.C. Martindale J.G and Scardino, F.L., "Textiles Yarns; Technology, Structure and Applications", wil;ey Interscience, New yaork, 1997.
3. Shenai, V.A., "Textiles finishing", Sevak publications, Bombay, 1989.

**FT2036**

**PROTECTIVE GARMENTS**

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

**AIM**

To impart knowledge on technology of protective garments – selection of fibres and yarns, fabric parameters and finishes applied.

**OBJECTIVE**

- To educate the knowledge on selection and properties of fibres and yarns for protective garments
- To educate on fabric structure and manufacturing techniques for protectivewear and garment manufacturing process for protective apparels.

**UNIT I** **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.

**UNIT II** **8**

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 III** **10**

Chemical finishes for protective garments:

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. Protective finishes for health care garments.

**UNIT IV** **9**

Garment construction

Method of construction of garments according to various protective end uses like protection against cold, ballistic protection, use of different fabric type (knitted, woven, and Non-woven), coated / laminated in different places. Use of interlining and composites. 3D structures. High tech textiles – variable electronics. Protective garments for industrial and apparel end uses.

**UNIT V** **9**

Evaluation of protective fabrics

Desirable properties of protective textiles – method of testing for thermal protective performance, 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**

**TEXT BOOKS**

1. Adanur .S, "Wellington Sears handbook of Industrial textiles" Technomic publishing co inc, 1995 ISBN : 1 – 56676 – 340 – 1
2. Pushpa Bajaj and Sengupta.A.K, "Protective clothing", the Textile Institute, 1992, ISBN 1-870812 – 44-1

**REFERENCES**

1. Chellamani.K.P, Chattopadhyay.D, "Yarns and Technical Textiles", SITRA, 1999.

**FT2037**

**VISUAL MERCHANDISING**

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

**AIM**

To equip the students with the knowledge on merchandising concept, use of Merchandising.

**UNIT I** **9**

Nature of fashion – Environment – Fashion Business – Segment of Fashion Industry.

**UNIT II** **9**

Merchandising – Role of Merchandiser – Principles of Merchandising – Types of Merchandising – Product presentation – Role of consumer.

**UNIT III** **9**

Importance of Visual Display. Fashion communication – Visual Merchandising – advantages – 3D visual merchandising system – optimizing techniques in retail space.

**UNIT IV** **9**

Optimize apparel assortments – retail environment defining. Comparison of Visual Merchandising with Fashion Merchandising.

**UNIT V**

**9**

Assortment planning – Visual data management – Data sharing – Assortment planning – Visualization & printing.

**TOTAL : 45 PERIODS**

**TEXT BOOKS**

1. Mike Easey, "Fashion Marketing ; Blackwell Science", 2000.
2. Maurice J. Johnson and Evelyne C. Moore, "Apperal product development", Prentice Hall inc. 2001.

**REFERENCES**

1. Marian L.Davis, "Visual Design in Dress", Prentice Hall inc., 1976.
2. Elaine Stone, "Fashion Merchandising", Blackwell Science Ltd., 2000.