

**COURSE STRUCTURE**

**&**

**SYLLABUS**  
**(3<sup>rd</sup> – 8<sup>th</sup> SEMESTER)**

**FOR B.TECH PROGRAMME**

**IN**

**FASHION TECHNOLOGY**

**BIJU PATNAIK UNIVERSITY OF TECHNOLOGY ORISSA,  
ROURKELA**

**2007 - 2008**

**COURSE STRUCTURE  
SECOND YEAR B.TECH PROGRAMME  
FASHION TECHNOLOGY**

<b>3rd Semester</b>				<b>4th Semester</b>			
<i>Theory</i>		<i>Contact Hrs.</i>	<i>Credit</i>	<i>Theory</i>		<i>Contact Hrs.</i>	<i>Credit</i>
	<b>L-T-P</b>				<b>L-T-P</b>		
CPFT 8201	Introduction to Fashion	3-0-0	3	CPFT 8203	Traditional & Ancient Textiles	3-0-0	3
CPFT 8202	Textile Fibres	3-0-0	3	CPFT 8204	Colour & Design Concept	3-1-0	4
BENG 1201	Electrical Mechines or	3-1-0	4	BENG 1208	Fluid Mechanics & Hydraulic Machines or	3-1-0	4
BENG 1208	Fluid Mechanics & Hydraulic Machines	3-1-0	4	BENG 1201	Electrical Machine		
CPTX 8203	Yarn Manufacture -I	3-1-0	4	BCSE 3202	Relational Database Management System	3-0-0	3
BCSE 3201	Object Oriented Programming using C++	3-0-0	3	HSSM 4202	Organisation Behaviour	3-0-0	3
HSSM 4201	Engg. Economics & Costing or	3-0-0	3	HSSM 4201	Engineering Economics & Costing		
HSSM 4202	Organisational Behaviour	3-0-0	3	CPTX 8204	Yarn Manufacture - II	3-1-0	4
	<b>Total</b>		<b>20</b>		<b>Total</b>		<b>21</b>
<i>Practicals/Sessionals</i>		<i>Contact Hrs.</i>	<i>Credit</i>	<i>Practicals/Sessionals</i>		<i>Contact Hrs.</i>	<i>Credit</i>
BENG 9202	Basic Electronics Laboratory or	0-0-3	2	BENG 9201	Basic Electrical Engineering Laboratory or	0-0-3	2
BENG 9201	Basic Electrical Engineering Laboratory			BENG 9202	Basic Electronics Laboratory		
BCSE 9201	OOPs Computer Lab	0-0-3	2	BCSE 9202	RDBMS Laboratory	0-0-3	2
CPTX 9201	Yarn Manufacture Laboratory - I	0-0-3	2	CPFT 9202	Colour & Design Lab.	0-0-3	2
CPFT 9201	Sketching & illustration Laboratory	0-0-3	2	CPTX 9203	Yarn manufacture Lab. II	0-0-3	2
			<b>8</b>				<b>8</b>
	<b>Total</b>		<b>28</b>		<b>Total</b>		<b>29</b>

**L-Lecture**

**T-Tutorial**

**P-Practical**

## 3<sup>rd</sup> Semester

### CPFT 8201 INTRODUCTION TO FASHION (3-0-0)

#### **Module-1** (10 hours)

Origin of fashion, Origin of clothing, Fashion language, Philosophy of design, Nature of fashion, Terminology of fashion: style, design, taste, classic, fad. Component of fashion: Silhouette, Texture, Details. Study of leading fashion designers, French, Italian, American, Indian, English

#### **Module-2** (5 hours)

Principle of fashion, Demographic & Psychographics, Economic factors, Sociological factor, Psychological factor, Environmental factor.

#### **Module-3** (5 hours)

Costumes of ancient civilization; Egypt, Roman, French, American, Indian

#### **Module-4** (5 hours)

Movement of fashion, the cycle of fashion; stages of cycle. Factors influencing fashion movement, Recurring fashion. Fashion prediction

#### **Module-5** (7 hours)

Leaders of fashion, Birth of fashion; designers role, manufacturer's role, retailer's role, insight & intuition of sources of design .Fashion influence & theories of fashion adoption.

#### **Module-6** (8 hours)

Business of fashion-Scope of fashion Business- Business growth & expansion  
Trade shows- Development of regional fashion centers- Trendes, Retailing,  
Merchandising, Fashion advertisement

#### **Reference Books:**

1. Inside Fashion Design -Kitty G.Dikerson
2. Inside Fashion Business -Kitty G. Dikerson
3. Elements of color & design –Sumathi G.J.

## CPFT 8202 TEXTILE FIBRES - (3-0-0)

### Module-I

(4 hours)

1. Classifications of Textile Fibers according to their nature and origin. Characteristics of good textile fiber, essential and desirable properties of apparel grade textile fibers & technical grade textile fibers

### Module – II

(12 hours)

2. Natural Fibres :- Vegetable Fibres :-  
Seed Fibres : Cotton - Cultivation and harvesting practices, Grading, morphological structure, physical and chemical properties and its applications.  
Bast Fibres : Jute - Cultivation and Harvesting, Retting, Scutching, woollenisation of jute, structure of jute fibre, effects of various treatments on jute fibre. Physical & Chemical properties of jute fibre, applications of jute fibre.  
Short description about other bast fibres - Hemp, flax, ramie, linen fibre , their Physical & Chemical properties and applications.  
Leaf fibres - pineapple fibres, their properties & applications.
3. Natural Fibres :- Protein Fibres  
Silk : Sericulture, Type of Silk fibers, Pre and post cocoon operation Degumming, Reeling, morphological structure of silk fiber etc. Physical and chemical properties of the silk fiber.  
Wool : Wool - types of wool, grading of wool, morphological structure of wool fiber, physical & chemical properties of wool fiber and its application.

### Module – III

(12 hours)

#### Production Process of Man made fibers.

4. Cellulose base fibers: Out line of the manufacturing of viscose rayon ,Poly nosic , high weight modulus fiber, Cupramonium rayon, acetate and triacetate fiber,  
Synthetic base Fiber: Out line of the manufacturing process of filament and staple fiber with special reference to polyester, polyamide, poly propylene and acrylic fiber. Basic principles and need for drawing and heat setting for synthetic fibers.

### Module – IV

(08 hours)

5. Study of high-tech fibers like Kevlar, nomex, carbon, glass, PBI etc. Identification of fibers.

### Modul–V

(6 hours)

5. Textured Yarn Technology.  
Importance of texturing, Different processes in textured technology, principle of draw texturing and study of draw texturing machines. Principle of air texturising and properties, Texturing with the solvent.

## **REFERENCE BOOKS:**

1. Textile Fibre, V. A. Shenai
2. Introduction to Textile Fibres, H. V. Sreenivas Moorthy
3. Dyeing & Chemical Technology of Textile Fibres, E. R. Trotman
4. Introduction to textiles, M. Joseph
5. Fibre Science and Tecnology, S.P.Mishra

## **BENG 1201 ELECTRICAL MACHINES (3-1-0)**

### **Module I**

**(10 hours)**

D.C Mechanics :

D.C Generator – construction and principle of operation, E.M.F. equation ; types of generator; no load and load characteristics; Voltage build-up of shunt

Generator; voltage regulation, Application.

D.C Motor –construction and principle of operation ; back E.M.F; torque and speed equations; characteristics and performance curves; speed control of series and shunt motors; motor starters; industrial application.

Losses and Efficiency of D.C machines.

### **Module II**

**(10 hours)**

Transformer:

Single phase – construction and principle of operation; E.M.F. equation; Phasor diagram; actual and approximate equivalent circuits; open and short circuit tests, voltage regulation; losses and efficiency.

Three Phase – Construction and principle of operation; connection of three single –phase units in wye, delta, open delta configurations; Autotransformer; conventional transformer connected as Autotransformer. Special Transformers – induction heating and high impedance and high frequency transformer.

### **Module III**

**(10 hours)**

Synchronous Machines :

Three- phase alternators – construction and principle of operation; E.M.F. equation; distribution and pitch factors; Synchronous reactance; performance of alternators on no-load and load; Phasor diagram; voltage regulation, power calculations of turbine and hydro-generators,; synchronization of a generator.

Three-Phase Synchronous Motor- construction and principle operation; V- curves; Phasor diagram; methods of starting; applications.

**Module IV****(10 hours)**

Three-Phase induction Motor- construction of slip ring and squirrel cage type induction motors; Phasor diagram and equivalent circuit; torque-slip characteristics; maximum torque calculations; open and short-circuit tests; losses and efficiency; starting of induction motors; speed control; Induction generator.

Single-Phase Induction Motor- construction and principle of operation; capacitor- start and capacitor-run motors; Universal motor; Stepper motors.

**REFERENCE BOOKS:**

1. Electrical Machines, Drives and Power Systems, 5th edition by Theodore Wildi (Pearson) : Text.
2. Electrical Machinery by A.E. Fitzgerald and Charles Kingsley, Jr., and S.D. Umans, Tata McGraw Hill Publication.
3. Principles of Electric Machines by V.K Meheta and R. Meheta , S. Chand Publication.

**BENG 1208 - FLUID MECHANICS AND HYDRAULIC MACHINES (3-1-0)****Module – I****(12 hours)**

Introduction : Scope of fluid mechanics and its development as a science

Physical property of Fluid

Density, specific gravity, specific weight, specific volume, surface tension and capillarity, viscosity, compressibility and bulk modulus, Fluid classification.

**Fluid static**

Pressure, Pascal's Law, Pressure variation for incompressible fluid, atmospheric pressure, absolute pressure, gauge pressure and vacuum pressure, manometer.

Hydrostatic process on submerged surface, force on a horizontal submerged plane surface, force on a vertical submerged plane surface.

**Module – II****(12 hours)**

Buoyancy and flotation, Archimedes' principle, stability of immersed and floating bodies, determination of metacentric height.

Fluid kinematics : Introduction, description of fluid flow, classification of fluid flow. Acceleration of fluid particles, flow rate and continuity equation, differential equation of continuity.

Fluid dynamics : Introduction, Euler's equation along a streamline, energy equation, Bernoulli's equation, Analysis of finite control volumes and its application to siphon, venturimeter, orifice meter

**Module – III****(6 hours)**

Turbine : Classification, reaction, Impulse, outward flow, inward flow and mixed flow turbines, Francis & Kaplan turbines, Pelton wheel, Physical description and principle of operation, Governing of Turbine.

**Module – IV****(8 hours)**

Centrifugal Pump : Principles of classification, Blade angles, Velocity triangle, efficiency, specific speed, characteristics curve.

Reciprocating Pump : Principles of working, slip, work done, effect of acceleration and frictional resistance, separation

**REFERENCE BOOKS:**

1. Fluid Mechanics, A.K. Mohanty, PHI
2. Introduction to Fluid Mechanics and Fluid Machines, S.K. Som and G. Biswas, TMH
3. Fluid Mechanics, Modi & Seth

**CPTX 8203 YARN MANUFACTURE - I (3-1-0)****Module I****(14 hours)****1. Formulation of cotton mixing:**

Objects of Mixing , general consideration for preparation of cotton mixing ,scientific bale management, Methods of mixing and blending.

**2. Blow Room:**

Principal action in opening and cleaning. Study of various types of machinery arranged in the sequence of a single process Blowroom Line for the various type of mixing. Study of various openers & cleaners like Mixing bale opener, unifloc, blendomat, monocylinder, axiflow cleaner, uniclean, CVT, etc. Concept of measuring of opening and cleaning efficiency of different opener and cleaner. Method of dust extraction in Blow Room . Study of lap forming unit and chute feed mechanism and their comparison . Process parameters of Blow Room ,.Waste control in Blow Room. Calculation relating to production and efficiency of machines. Maintenance schedules.

**Module II****(14 hours )****3. Carding:**

Objects of Carding. Constructional Features of Carding Machine. Principles of carding & stripping actions , Study of different parts and function of a Carding

Machine. Settings and gauging of different parts of Carding Machine. Mechanical and Actual draft. . Study of card clothing :- metallic wire geometry of licker-in, cylinder, flat and doffer wire. Mechanics of fibre entanglement and fibre transfer during carding, Mechanics of neps and hook formation and its effect on yarn quality. Card waste –types and control. Calculation of production, speed, draft etc related to carding machine. calculation in card . Defects in card Sliver and their causes and remedies. Maintenance schedules. Study of the function of Auto leveler in Card.

### **Module III**

**(9 hours )**

#### **4. Draw Frame:**

Objects of Drawing. Principles of doubling and drafting. Study of different parts and function of a Draw Frame Machine. Study of commonly used drafting systems in draw frame. Drafting irregularities and its remedies. Design and principle of Auto leveler. Quality and Process parameters of Draw Frame department and its evaluation. Study of High Speed DrawFrame. Production calculations. Maintenance schedules.

### **Module IV**

**( 09 hours )**

#### **5. Combing:**

Objects of Comber. Methods of lap preparation for comber Machine . Mechanism of combing operation (Combing Cycle). Noil Theory. Types of feed and its effect on noil extraction. Process parameters & evaluation. Production calculations .Maintenance schedules.

### **REFERENCE BOOKS:**

1. Manual Cotton Spinning-Vol.to 5, Textile Institute
2. A practical Guide to Opening & cleaning, W. Klien  
Draw frame, Speed frame & Comber, Ring Spinning ( All parts)
3. The Institute of Technology , Szalowski USE series on Textile Processing
4. Recent Advances in Spinning Technology, Salhotra
5. Spun Yarn Technology, Oxtoby

## **BCSE 3201 OBJECT ORIENTED PROGRAMMING USING C++ (3-0-0)**

### **Module I**

**(10 hours)**

Introduction to object oriented programming, user defined types, polymorphism, and encapsulation. Getting started with C++ -syntax, data-type, variables, strings, functions, exceptions and statements, namespaces and exceptions, operators. Flow control, functions, recursion. Arrays and pointers, structures.

**Module II** (10 hours)

Abstraction mechanisms: Classes, private, public, constructors, member functions, static members, references etc. Class hierarchy, derived classes.

Inheritance: simple inheritance, polymorphism, object slicing, base initialization, virtual functions.

**Module III** (12 hours)

Prototypes, linkages, operator overloading, ambiguity, friends, member operators, operator function, I/O operators etc.

Memory management: new, delete, object copying, copy constructors, assignment operator, this input/output.

Exception handling: Exceptions and derived classes, function exception declarations, Unexpected exceptions, Exceptions when handling exceptions, resource capture and release etc.

**Module IV** (8 hours)

Templates and Standard Template library: template classes, declaration, template functions, namespaces, string, iterators, hashes, iostreams and other type.

Design using C++ design and development, design and programming, role of classes.

**Reference Books:**

1. Bhavé & Patekar- Object oriented Programming with C++, Pearson Education
2. Ashok N. Kamthane- Object oriented Programming with ANSI & Turbo C++, Pearson Education.
3. Robert Lafore- Object oriented programming in Microsoft C++.
4. Balguru Swamy-C++, TMH publication

**HSSM 4201 ENGINEERING ECONOMICS AND COSTING (3-0-0)**

**Module I** (10 hours)

Present worth comparisons, Comparisons of assets with equal, unequal and infinite lives, comparison of deferred investments, Future worth comparison, pay back period comparison.

**Module II** (10 hours)

Projects : Benefit/ Cost analysis, quantification of project, cost and benefits, benefit/ cost applications, Cost –effectiveness analysis.

**Module III** (10 hours)

Fixed and variable cost, product and process costing, standard costing, cost estimation, relevant cost for decision making, cost control and cost reduction technique.

## **REFERENCE BOOKS:**

1. Horn green, C.T., Cost Accounting, Prentice Hall of India
2. Riggs, J.L ., Dedworth, Bedworth, D.B, Randhawa, S.U. Engineering Economics, McGraw Hill International Edition, 1996 (Chapter 2,3,4,5,7,8,9,11,12)

## **HSSM 4202 ORGANIZATIONAL BEHAVIOUR (3-0-0)**

### **Module I**

**(8 hours)**

The Study of Organizational Behaviour : Learning objectives, Definition and Meaning, Why Study OB, An OB Model, New Challenges for OB Manager.

Learning – Nature of Learning, How Learning occurs, Learning and OB.

Case Analysis

### **Module II**

**(10 hours)**

Foundations of Individual Behaviour : Personality – Meaning and Definition, Determinants of Personality, Personality Traits, Personality and OB.

Perception – Meaning and Definition, Perceptual Process, Importance of Perception in OB.

Motivation – Nature and Importance, Hertzberg’s Two Factor Theory, Maslow’s Need Hierarchy Theory, Alderfer’s ERG Theory, Evaluations.

Case Analysis

### **Module III**

**(12 hours)**

Organizational Behavior Process: Communication – Importance, Types, Gateways and Barriers to Communication, Communication as a tool for improving Interpersonal Effectiveness. Groups in Organizations - Nature, Types, Why do people join groups, Group Cohesiveness and Group Decision-making Managerial Implications, Effective Team Building. Leadership – Leadership & Management, Theories of Leadership – Trait theory, Leader Behavior theory, Contingency Theory, Leadership and Followership, How to be an effective Leader. Conflict – Nature of Conflict and Conflict Resolution.

An Introduction to Transactional Analysis (TA).

Case Analysis

### **Module IV**

**(10 hours)**

Organization : Organizational Culture – Meaning and Definition, Culture and Organizational Effectiveness. Introduction to Human Resource Management – Selection, Orientation, Training and Development, Performance Appraisal, Incentives Organizational Change – Importance of Change, Planned Change and OB techniques. International Organizational Behavior – Trends in International Business, Cultural Differences and Similarities, Individual and Interpersonal Behavior in Global Perspective.

**TEXTBOOKS:**

1. Keith Davis, Organizational Behavior, McGraw – Hill.
2. K.Aswathappa, Organizational Behavior, Himalaya Publishing House.

**REFERENCE BOOKS:**

1. Stephen P. Robbins, Organizational Behavior, Prentice Hall of India.
2. Pradip N. Khandwalla, Organizational Behavior, McGraw – Hill, New Delhi.

**PRACTICALS**

**BENG 9202 BASIC ELECTRONICS LAB. (0-0-3)**

(At least 8 experiments including 1 - 7 and any one from 8 - 10)

1. Familiarity with electronics components and Devices  
Testing of a semiconductor Diode and a Transistor. IC pins connection (Digital Multimeter should be used should be used in testing components and devices).
2. Study and use of Oscilloscope to view waveforms and measure its amplitude and frequency.
3. V - I Characteristic of a semiconductor diode. Determining DC and AC resistance.
4. Half wave and Full wave rectifiers without and with capacitor filter. Record of waveforms, Measurement of Average and rms values.
5. V - I Characteristics of anpn or pnp transistor. DC Biasing and measurement of dc voltages and currents.
6. Gain - frequency response of JFET common source R-C coupled amplifier/BJT CE RC coupled Amplifier.
7. Op amp in Inverting, non inverting, Integrating and Differentiating configuration, Record of wave forms.
8. Truth Tables of logic gates.
9. Study and experiment using MUX - DEMUX ICs / Shift Register IC.
10. Study on CMOS logic Inverter.

## **BENG 9201 BASIC ELECTRICAL ENGINEERING LAB. (0-0-3)**

### **List of Experiment (Any 8 of the following)**

1. Study and measurement the armature and field resistance of a DC machine.
2. Calibration of ammeter, voltmeter and wattmeter with the help of sub-standard instrument.
3. Verification of circuit theorems. Thevenin's and Superposition theorems (with DC source only).
4. Voltage-current characteristics of incandescent lamps and fusing time-current characteristics of fuse wire.
5. Measurement of current, voltages and power in R-L-C series circuit excited by Single Phase AC supply.
6. Connection and starting of a three phase induction motor using direct online (DOL). or star-delta starter.
7. Connection and measurement of power consumption of a fluorescent lamp.
8. Determination of open circuit characteristics (OCC) of DC machine.
9. Starting and speed control of a DC shunt motor.
10. Connection and testing of a single phase energy meter (unity power factor load only)
11. Study of fan motor

## **BCSE 9201 OOPs COMPUTER LAB**

### **(10 classes for 10 different programs)**

1. Programs on concept of classes and objects.(1 class)
2. Programs using inheritance.(1 class)
3. Programs using polymorphism.(1 class)
4. Programs on use of operator overloading.(1 class)
5. Programs on use of memory management.(1 class)
6. Programs on exception handling and use of templates.( 1 class)
7. Programs on File handling in C++.(1 class)
8. Design problem on stock and accounting of a small organization, railway reservation, payroll preparation and optimization problem.(3 classes)

## **CPTX 9201 YARN MANUFACTURE LAB. - I (0-0-3)**

1. Study of flow of materials in a Blow room line.

2. Study of flow of material in a Carding Machine. Various parts of the machine and functions.
3. Study of the different parts of the Draw Frame and the Flow of materials in the machine.
4. Study of the different parts of a modern Speed Frame and the Flow of materials in the machine.
5. Study of the different parts of Ring Frame and the Flow of materials in the machine.
6. Study of the different parts of a Rotor spinning Frame and the Flow of materials in the machine.
7. To produce yarn from given roving at Ring frame.
8. To produce yarn from given sliver at Rotor
9. Study of Flow of materials and different parts of a Ring doubler.
10. Study of Reeling, Bundling and Bailing Machine.

#### **CPFT 9201 SKETCHING & ILLUSTRATION LAB. (0-03)**

1. To study the basic elements of drawing. Perspective, Shading & composition, drawing techniques.
2. To learn and practice Free hand Sketching, Techniques of enlarging & reducing designs.
3. To study geometrical, traditional & modern designs.
4. Drawing of Flowers, leaves, birds, animals, human figure & dancing figure.
5. Drawing of decorative forms useful for design.
6. To practice the drawing of basic figures croquis with appropriate technology: Varying postures of the model, women's poses, men's poses, parts like figures head, eyes, lips, hands, ears, feet.
7. To learn Media techniques: Fashion figure with pencil shading , pencil color , water color, micro tip pen .

## *4th Semester*

### **CPFT 8203 TRADITIONAL AND ANCIENT TEXTILES (3-0-0)**

#### **Module-I ( 03 hours )**

1. Traditional Textile and their relation with religion, culture, climatic conditions and socio-economic conditions.

#### **Module-II ( 21 hours )**

2. Traditional Textiles of different states of India
  - Woven based motifs/designs.
  - Printed design.Study of Traditional and cultural motifs such as Chikenkari, Brocade, Phulkari, Kantha, Baluchar, Jamdani, Patola, Bandhani, Sindh, Kalamkari, Pochampali, Ikat, Kanchipuram, Himroo, Tanchoi, Kani-Jamavar, Pairhani & Madhubani with reference to their history and origin, product specification and product range & application.

#### **Module-III ( 07 hours )**

3. Study of some Traditional Textiles of other Countries
  - Traditional Textiles of Japan - Kimono
  - Native American Indian and Ethnic Textiles
  - Egyptian Traditional Textiles
  - Decorative Textiles of Romanian Tradition
  - Spiritual Textiles

#### **Module-IV ( 04 hours )**

5. Textiles of Ancient civilization
  - Egypt
  - Roman
  - French

#### **REFERENCE BOOKS:**

1. Traditional Indian Textiles, Gillow & Bernard by Thames & Hudson, London
2. Traditional Textile Designs of India, B.K. Behera, IIT, Delhi.
3. Hand woven fabrics of India by Dhaninja & Jain, Mapin Publishing, Ahamedabad.
4. The costumes and Textiles of India, Jamila Brij Bhusan.

### **CPFT 8204 COLOUR AND DESIGN CONCEPT (3-1-0)**

#### **Module-I ( 20 hours )**

1. **Elements of an Art and Principles of Design :**  
Basic concept of Line, Direction, Shape, Size, Texture Value, Colour.

Repetition, Alternation, Harmony, Gradation, Contrast, Dominance and subordination, Unity, Balance.

2. Composition of design - by geometric ornamentation, by conventional treatment of natural and artificial forms, by adoption and reproduction of earlier design. Natural Motif, Decorative Motif, Geometric Motif, Abstract Motif.

### **Module-II**

**( 15 hours )**

3. **Colour Theory :**

Definition of colour theories, Light Theory of colour, Chromatic Circle, Colour schemes-mono chromatic, achromatic, polychromatic and analogous colour schemes. Pigment Theory of Colour, Colour Wheel, Complementary Colours, Attributes of Primary and Secondary Colours. Tint and Shades

4. **Colour Modification and Colour Harmony :**

High Key, Low Key and Mid Key.

Change in Hue, Change in value, Neutralised Colours.

Achromatic Harmony, Monochromatic Harmony, Analogues Harmony, Complementary Harmony, Polychromatic Harmony.

5. **Application of Colour to Textiles :**

Influence of Fabric Characteristics on Appearance of Colour.

Colour in Woven Design. Colour in Printed Design.

Utility of a Knowledge of the Qualities of Colours.

Requirements of the Textile Colourist.

### **Module-III**

**( 10 hours )**

6. **Methods of Composing Textile Design :**

All Over Repeating Design, Half Drop, Diamond, Ogee

Waved Line, Rectangular Drop Reverse, Sateens.

7. Factors influencing the Appearance and Ornamentation of Fabrics with reference to raw-material, weave and finish.

### **REFERENCE BOOKS:**

1. WATSONS Textile Design and Colour, Gosciki Z. J.
2. Inside Fashion Design, Sharon Lee Tats
3. Pattern Design, Lewis F. day
4. Colour Harmony, Bride N. Whelan, Rockport Publishers.
5. The Costumes and Textiles of India, Jamila Brij Bhusan
6. Soamn, Jullian, 'Professional Fashion illustration' B.T. Batslord, London 1995
7. Drake, Nicholas, 'Fashion illustration Today' Thamesis Hudson. London

## **BENG 1208 - FLUID MECHANICS AND HYDRAULIC MACHINES (3-1-0)**

### **Module – I**

**(12 hours)**

Introduction: Scope of fluid mechanics and its development as a science

Physical property of Fluid

Density, specific gravity, specific weight, specific volume, surface tension and capillarity, viscosity, compressibility and bulk modulus, Fluid classification.

### **Fluid static**

Pressure, Pascal's Law, Pressure variation for incompressible fluid, atmospheric pressure, absolute pressure, gauge pressure and vacuum pressure, manometer.

Hydrostatic process on submerged surface, force on a horizontal submerged plane surface, force on a vertical submerged plane surface.

### **Module – II**

**(12 hours)**

Buoyancy and flotation, Archimedes' principle, stability of immersed and floating bodies, determination of metacentric height.

Fluid kinematics: Introduction, description of fluid flow, classification of fluid flow. Acceleration of fluid particles, flow rate and continuity equation, differential equation of continuity.

Fluid dynamics : Introduction, Euler's equation along a streamline, energy equation, Bernoulli's equation, Analysis of finite control volumes and its application to siphon, venturi meter, orifice meter

### **Module – III**

**(6 hours)**

Turbine : Classification, reaction, Impulse, outward flow, inward flow and mixed flow turbines, Francis & Kaplan turbines, Pelton wheel, Physical description and principle of operation, Governing of Turbine.

### **Module – IV**

**(8 hours)**

Centrifugal Pump : Principles of classification, Blade angles, Velocity triangle, efficiency, specific speed, characteristics curve.

Reciprocating Pump : Principles of working, slip, work done, effect of acceleration and frictional resistance, separation

### **Text Books:**

1. Fluid Mechanics, A.K. Mohanty, PHI
2. Introduction to Fluid Mechanics and Fluid Machines, S.K. Som and G. Biswas, TMH
3. Fluid Mechanics, Modi & Seth

## **BENG 1201 ELECTRICAL MACHINES (3-1-0)**

### **Module I**

**(10 hours)**

D.C Mechanics :

D.C Generator – construction and principle of operation, E.M.F. equation ; types of generator; no load and load characteristics; Voltage build-up of shunt

Generator; voltage regulation, Application.

D.C Motor –construction and principle of operation ; back E.M.F; torque and speed equations; characteristics and performance curves; speed control of series and shunt motors; motor starters; industrial application.

Losses and Efficiency of D.C machines.

## **Module II**

**(10 hours)**

Transformer:

Single phase – construction and principle of operation; E.M.F. equation; Phasor diagram; actual and approximate equivalent circuits; open and short circuit tests, voltage regulation; losses and efficiency.

Three Phase – Construction and principle of operation; connection of three single –phase units in wye, delta, open delta configurations; Autotransformer; conventional transformer connected as Autotransformer. Special Transformers – induction heating and high impedance and high frequency transformer.

## **Module III**

**(10 hours)**

Synchronous Machines :

Three- phase alternators – construction and principle of operation; E.M.F. equation; distribution and pitch factors; Synchronous reactance; performance of alternators on no-load and load; Phasor diagram; voltage regulation, power calculations of turbine and hydro-generators,; synchronization of a generator.

Three-Phase Synchronous Motor- construction and principle operation; V- curves; Phasor diagram; methods of starting; applications.

## **Module IV**

**(10 hours)**

Three-Phase induction Motor- construction of slip ring and squirrel cage type induction motors; Phasor diagram and equivalent circuit; torque-slip characteristics; maximum torque calculations; open and short-circuit tests; losses and efficiency; starting of induction motors; speed control; Induction generator.

Single-Phase Induction Motor- construction and principle of operation; capacitor- start and capacitor-run motors; Universal motor; Stepper motors.

## **REFERENCE BOOKS:**

1. Electrical Machines, Drives and Power Systems, 5th edition by Theodore Wildi (Pearson) : Text.
2. Electrical Machinery by A.E. Fitzgerald and Charles Kingsley, Jr., and S.D. Umans, Tata McGraw Hill Publication.
3. Principles of Electric Machines by V.K Meheta and R. Meheta , S. Chand Publication.

## **BCSE 3202 RELATIONAL DATABASE MANAGEMENT SYSTEMS (3-0-0)**

### **Module I**

**(10 hours)**

Database System Architecture - Data Abstraction, Data Independence, Data Definitions and Data Manipulation Languages.

Data models - Entity Relationship(ER), Mapping ER Model to Relational Model, Network .Relational and Object Oriented Data Models, Integrity Constraints and Data Manipulation Operations.

**Module II** (10 hours)

Relation Query Languages, Relational Algebra, Tuple and Domain Relational Calculus, SQL and QBE.

Relational Database Design: Domain and Data dependency, Armstrong's Axioms, Normal Forms, Dependency Preservation, Lossless design, Comparison of Oracle & DB2.

**Module III** (8 hours)

Query Processing and Optimization: Evaluation of Relational Algebra Expressions, Query Equivalence, Join strategies, Query Optimization Algorithms.

**Module IV** (12 hours)

Storage Strategies: Indices, B-Trees, Hashing, Transaction processing: Recovery and Concurrency Control, Locking and Timestamp based Schedulers, Multiversion and Optimistic Concurrency Control Schemes.

Advanced topics: Object-Oriented and Object Relational databases. Logical Databases, Web Databases, Distributed Databases, Data Warehouse and Data Mining.

**REFERENCE BOOKS:**

1. Elmaski & Navathe -Fundamentals of Database Systems, 4<sup>th</sup> Edition, Pearson Education
2. C.J.Date - An introduction to Database Systems, Pearson Education
3. Bipin Desai -An introduction to Database System, Galgotia Publication.

**HSSM 4202 ORGANIZATIONAL BEHAVIOUR (3-0-0)**

**Module I** (8 hours)

The Study of Organizational Behaviour : Learning objectives, Definition and Meaning, Why Study OB, An OB Model, New Challenges for OB Manager.

Learning – Nature of Learning, How Learning occurs, Learning and OB.

Case Analysis

**Module II** (10 hours)

Foundations of Individual Behaviour : Personality – Meaning and Definition, Determinants of Personality, Personality Traits, Personality and OB.

Perception – Meaning and Definition, Perceptual Process, Importance of Perception in OB.

Motivation – Nature and Importance, Hertzberg's Two Factor Theory, Maslow's Need Hierarchy Theory, Alderfer's ERG Theory, Evaluations.

Case Analysis

**Module III****(12 hours)**

Organizational Behaviour Process : Communication – Importance, Types, Gateways and Barriers to Communication, Communication as a tool for improving Interpersonal Effectiveness. Groups in Organizations - Nature, Types, Why do people join groups, Group Cohesiveness and Group Decision-making Managerial Implications, Effective Team Building. Leadership – Leadership & Management, Theories of Leadership – Trait theory, Leader Behaviour theory, Contingency Theory, Leadership and Followership, How to be an effective Leader. Conflict – Nature of Conflict and Conflict Resolution.

An Introduction to Transactional Analysis (TA).

Case Analysis

**Module IV****(10 hours)**

Organization : Organizational Culture – Meaning and Definition, Culture and Organizational Effectiveness. Introduction to Human Resource Management – Selection, Orientation, Training and Development, Performance Appraisal, Incentives Organizational Change – Importance of Change, Planned Change and OB techniques. International Organizational Behaviour – Trends in International Business, Cultural Differences and Similarities, Individual and Interpersonal Behaviour in Global Perspective.

Case Analysis

**TEXTBOOKS:**

1. Keith Davis, Organizational Behaviour, McGraw – Hill.
2. K.Aswathappa, Organizational Behaviour, Himalaya Publishing House.

**REFERENCE BOOKS:**

1. Stephen P. Robbins, Organizational Behaviour, Prentice Hall of India.
2. Pradip N. Khandwalla, Organizational Behaviour, McGraw – Hill, New Delhi.

**HSSM 4201 ENGINEERING ECONOMICS AND COSTING (3-0-0)****Module I****(10 hours)**

Present worth comparisons, Comparisons of assets with equal, unequal and infinite lives, comparison of deferred investments, Future worth comparison, pay back period comparison.

**Module II****(10 hours)**

Analysis of public Projects : Benefit/ Cost analysis, quantification of project, cost and benefits, benefit/ cost applications, Cost –effectiveness analysis.

**Module III****(10 hours)**

sensitivity.

Fixed and variable cost, Product and Process Costing, Standard Costing, Cost estimation, Relevant Cost for decision making, Cost estimation, Cost control and Cost reduction techniques.

### **REFERENCE BOOKS:**

1. Horn green, C.T., Cost Accounting, Prentice Hall of India
2. Riggs, J.L ., Dedworth, Bedworth, D.B, Randhawa, S.U. Engineering Economics, McGraw Hill International Edition, 1996 (Chapter 2,3,4,5,7,8,9,11,12)

## **CPTX 8204 YARN MANUFACTURING-II ( 3-1-0 )**

### **MODULE-I**

**(8 hours)**

#### **Speed frame:**

Objects of speedframe. Study of different parts and function of a modern speed frame machine. principles of drafting, twisting and winding in speed frame, Mechanism of package formation, calculation relating to speed, production and efficiency of speed frame, process parameter and maintenance schedule.

### **MODULE-II**

**(20 hours)**

#### **Ring spinning: 14hrs**

Objects of ring spinning machine, study of different parts and function of modern ring spinning, principles of drafting, twisting and winding in ring frame, study of different drafting system, Design of spindles, rings and travelers, Mechanism of package formation in ring frame, spinning geometry. Forces acting on yarn and traveler during spinning. Optimisation of ring spinning system. calculation relating to speed, production and efficiency of ring frame, process parameter and evaluation. common defects in ringspun yarn, causes and remedies, maintenance schedule.

#### **Post spinning: 6hrs**

Objects of doubling, study of working principle and process parameters of various types of doubler i.e ring doubler, TFO, dry and weight doubling, twist in double yarn, balance twist. Objects and working principle of reeling balling and bundling machine.

### **MODULE-III**

**(16 hours)**

#### **New spinning system:**

##### **a) Rotor spinning: 6 hrs**

Principles and mechanism of yarn formation in rotor spinning system, study of different parts and functions of rotor spinning machine, calculation relating to speed, production and efficiency of rotor machine,

**b) Airjet spinning system: 4hrs**

Principles and mechanism of yarn formation in airjet machine, study of different parts and functions of rotor spinning machine, calculation relating to speed, production and efficiency of airjet machine.

**c) Friction spinning system: 4hrs**

Principles and mechanism of yarn formation in friction spinning system, study of the features of DREF-I, DREF-II, DREF-III machine study of different parts and functions of rotor spinning machine, calculation relating to speed, production and efficiency of DREF machine.

**d) Comparison of the structure and properties; 2hrs**

Rotor. Air jet and Dreff spun yarn

**REFERENCE BOOKS:**

1. Manual Cotton Spinning-Vol.to 5, Textile Institute
2. A practical Guide to Opening & cleaning, W. Klien  
Draw frame, Speed frame & Comber, Ring Spinning ( All parts)
3. The Institute of Technology , Szalowski USE series on Textile Processing
4. Recent Advances in Spinning Technology, Salhotra
5. Spun Yarn Technology, Oxtoby
6. TFO, HVS Murty

**PRACTICALS**

**BENG 9201 BASIC ELECTRICAL ENGINEERING LAB. (0-0-3)**

**List of Experiment (Any 8 of the following)**

1. Study and measurement the armature and field resistance of a DC machine.
2. Calibration of ammeter, voltmeter and wattmeter with the help of sub-standard instrument.
3. Verification of circuit theorems. Thevenin's and Superposition theorems (with DC source only).
4. Voltage-current characteristics of incandescent lamps and fusing time-current characteristics of fuse wire.
5. Measurement of current, voltages and power in R-L-C series circuit excited by Single Phase AC supply.

6. Connection and starting of a three phase induction motor using direct online (DOL). or star-delta starter.
7. Connection and measurement of power consumption of a fluorescent lamp.
8. Determination of open circuit characteristics (OCC) of DC machine.
9. Starting and speed control of a DC shunt motor.
10. Connection and testing of a single phase energy meter (unity power factor load only)
11. Study of fan motor

### **BENG 9202 BASIC ELECTRONICS LAB. (0-0-3)**

(At least 8 experiments including 1 - 7 and any one from 8 - 10)

1. Familiarity with electronics components and Devices  
Testing of a semiconductor Diode and a Transistor. IC pins connection (Digital Multimeter should be used in testing components and devices).
2. Study and use of Oscilloscope to view waveforms and measure its amplitude and frequency.
3. V - I Characteristic of a semiconductor diode. Determining DC and AC resistance.
4. Half wave and Full wave rectifiers without and with capacitor filter. Record of waveforms, Measurement of Average and rms values.
5. V - I Characteristics of npn or pnp transistor. DC Biasing and measurement of dc voltages and currents.
6. Gain - frequency response of JFET common source R-C coupled amplifier/BJT CE RC coupled Amplifier.
7. Op amp in Inverting, non inverting, Integrating and Differentiating configuration, Record of wave forms.
8. Truth Tables of logic gates.
9. Study and experiment using MUX - DEMUX ICs / Shift Register IC.
10. Study on CMOS logic Inverter.

### **BCSE 9202 RDBMS LAB. (0-0-3)**

**(10 Classes for 10 Different Programs)**

1. Use of SQL syntax : Insertion, Deletion, Join), Updation using SQL. (1 class)
2. Program segments in embedded SQL using C as host language to find average grade point of a student, etc.. (1 class)
3. Program for Log based data recovery technique. (1 class)
4. Program on data recovery using check point technique. (1 class)
5. Concurrency control problem using lock operations. (1 class)

6. Use of package (ORACLE) for programming approaches(2 classes)
7. Use of package (DB2) for programming approaches(2 classes)
8. Programs on JDBC/ODBC to print employee's / student's information of a particular department. (1 class)

### **CPFT 9202 COLOUR AND DESIGN LAB. (0-0-3)**

1. To develop some design using basic concept of line
2. To produce floral, geometrical abstract and boarder design. Enlargement and deduction of design.
3. To develop design using different type of motifs.
4. To show colour mixtures according to pigment theory of colour.
5. To show arrangement of the primary, secondary and intermediate colour.
6. To modify pigment colour by using with white (Tints)
7. To modify pigment colour by using with black (shades)
8. To modify pigment colour by mixing with another colour
9. To produce monochromatic contrast.
10. To produce polychromatic contrast of the following kinds.
  - Contrast of hue
  - Contrast of tone
11. To study placement of figures and motif- half drop, double half drop, diamond base, ogee base, rectangular, horizontal, vertical etc.
12. To produce at least five sketches by using different colour shades with own imagination.

### **CPFT 9203 YARN MANUFACTURE LAB- II**

1. Study of different parts and flow of material in a simplex machine.
2. Study of building mechanism in simplex.
3. Study of the gearing diagram of simplex and calculation of draft constant.
4. Calculation of spindle speeds and twist constant of a speed frame.
5. Learning of changing CP, TW, & LW in the speed frame.
6. Study of roller setting in speed frame.
7. Study of different parts and flow of material in a Ring frame.
8. Study of building mechanism in Ring frame.
9. Study of the gearing diagram of Ring frame & calculation of draft constant.
10. Calculation of spindle speeds and twist constant of a Ring frame.
11. Learning of changing CP, TW, Ratchet wheel, cam of ring frame.
12. Study of different parts and flow of material in a Rotor machine.
13. Study of gearing diagram of rotor machine.
14. Study of different parts of ring doubler.

**COURSE STRUCTURE  
THIRD YEAR B.TECH PROGRAMME  
FASHION TECHNOLOGY**

<b>5th Semester</b>			<b>6th Semester</b>				
<i>Theory</i>	<i>Contact Hrs.</i>	<i>Credit</i>	<i>Theory</i>	<i>Contact Hrs.</i>	<i>Credit</i>		
	<b>L-T-P</b>			<b>L-T-P</b>			
HSSM 4301	Optimisation Engineering	3-0-0	3	HSSM 4302	Production and operation Management	3-0-0	3
CPFT 8205	Fabric Manufacture	3-1-0	4	CPFT 8209	Garment Manufacturing - II	3-1-0	4
CPFT 8206	Woven Fabric Structure	3-1-0	4	CPFT8211	Pattern Making - II	3-1-0	4
CPFT 8207	Introduction to Wet Processing	3-0-0	3	CPFT 8212	Textile & Garment Testing	3-1-0	4
CPFT 8208	Garment Manufacturing - I	3-1-0	4	CPFT 8213	Garment Processing & Finishing	2-1-0	3
CPFT 8210	Pattern making - 1	3-0-0	3	CPFT 8214	Knitting Technology & Knitwear Design	3-0-0	3
	<b>Total</b>		<b>21</b>		<b>Total</b>		<b>21</b>
<i>Practicals/Sessionals</i>	<i>Contact Hrs.</i>	<i>Credit</i>	<i>Practicals/Sessionals</i>	<i>Contact Hrs.</i>	<i>Credit</i>		
CPFT 9203	Fabric Manufacture Laboratory	0-0-2	2	CPFT 9206	Pattern Making & Garment Construction-II Lab.	0-0-3	2
CPFT 9204	Pattern making & Garment Const.- I Lab	0-0-2	2	CPFT 9207	Textile and Garment Testing Laboratory	0-0-2	2
CPFT 9205	Design Idea and Fashion Co-ordination	0-0-2	2	CPFT 9208	Wet Processing & Finishing of Garment Lab	0-0-2	2
	<b>Total</b>		<b>6</b>		<b>Total</b>		<b>6</b>
			<b>27</b>				<b>27</b>

**L-Lecture**

**T-Tutorial**

**P-Practical**

## *5<sup>th</sup> Semester*

### **HSSM 4301 OPTIMIZATION IN ENGINEERING (3-0-0)**

**Course Objective :** The course aims at acquainting the students to mathematical modeling of engineering design, operation and maintenance problems and their optimization algorithms.

#### **Module – I**

**(13 hours)**

Formulation of engineering optimization problems : Decision variables, objective function and constraints. Example of typical design, operation and maintenance problems in engineering : Design of a water tank, design of a truss, design of a network (electrical, communication sewerage and water supply networks), product mix problem, transportation and assignment problems, shift scheduling of employees, design of reliable devices, design of reactors, shortest route problem, set covering problem, traveling salesman problems. Only physical problems and their mathematical models to be discussed.

Classical Optimization methods : Unconstrained local and global optimum for functions of single variable. Concave and Convex functions, Necessary and sufficient conditions of optimum, Extension to functions of several variables, Hessian matrix, and its relations to minimum (maximum) of a function, Quadratic forms, Minimum (maximum) of a concave (convex) function in a convex feasible region.

Linear Programming Problem : Formulation, Graphical solution, Simplex method, Duality theory, Dual simplex method, Formulation and solution of engineering problems of planning and scheduling.

#### **Module – II**

**(10 hours)**

Sensitivity Analysis, Transportation Problem, Assignment Problem, Network Models : Minimal Spanning Tree Problem, Maximal Flow Problem, Shortest Route Problem, Minimum Cost Flow Problem. Algorithms and applications to be covered.

#### **Module – III**

**(10 hours)**

Integer Linear Programming Problem. Branch and Bound and Cutting Plane Methods. Zero-one Programming Problem, Knapsack Problem, Set covering Problem, Knapsack Problem, Set Partitioning Problem, Traveling Salesman Problem. Deterministic Dynamic Programming Problems. Applications and algorithms to be discussed.

#### **Module – IV**

**(12 hours)**

Single Variable Unconstrained Minimization Problems : (1) Region elimination method : Fibonacci Method, Golden Section method. (2) Point Estimation Method : Successive quadratic estimation method, (3) Gradient Based Methods : Newton – Raphson Method, Bisection method.

Multiple Variable Unconstrained Optimization Algorithms (1) Direct Search Methods : Evolutionary optimization, Simplex search methods, Hookes – Jeeves Pattern Search Method (2) Gradient – based Methods : Steepest descent method, Conjugate gradient method, Variable metric method.

Constrained Optimization Algorithm : Kuhn – Tucker Conditions, Penalty function Method, Lagrangian Multiplier Method, Frank – Wolfe Method. Feasible Direction Method, Generalized Reduced Gradient Method. Geometric Programming Methods.

### **REFERENCES:**

1. H. A. Taha – Operations Research, Prentice Hall of India, 2004.
2. K. Deb., Optimization in Engineering Design, Prentice Hall of India, 2003.
3. D. T. Phillips, A Ravindran and J.J. Solaberg, Principles of Operation Research, John Wiley and Sons

## **CPFT 8205 FABRIC MANUFACTURING (3-1-0)**

### **Module – I**

**(10 hours)**

#### **Yarn Preparation :**

**Winding** - Objects of warp and weft winding , types of winding (precession and non precession), types of winding defects and their remedies, path of yarn in a modern winding machine.

**Warping** - Objects of warping, types of warping (Direct and Sectional types), path of yarn in a modern warping machine,

**Sizing** - Objects of sizing, sizing ingredients and their function, preparation of sizing paste, path of yarn in a slasher sizing machine.

**Drawing in** - Objects drawing and denting Method of drawing in, knotting gattig..

### **Module-II**

**(10 hours)**

General Loom elements and mechanism., Primary Motions - Shedding, types of shedding mechanism, tappet shedding mechanism , timing of shedding, healed staggering, reversing motions. Picking , types of Picking mechanism, over and under picking mechanism and their Comparison. Shuttle checking. Beating up mechanism, Function of reed, types of reed and reed count.

### **Module-III**

**(10 hours)**

Secondary and Auxiliary Motions in loom: Take up motion, working of the (5 wheel, 7 wheel and continuous) take up motion, Basic concepts of the let off motion ,working of the let off motion,. Warp protector mechanisms (loose and Fast Reed Types), Principle and working of side weft fork, mechanical warp stop and electrical warp stop motion.

**Module- IV****(15 hours)**

Fancy Fabric Formation: Functions of Dobby, Types of Dobby, Function of Jacquard, Drop Box Mechanism, Working of cow burn and pecks drop box motion. Production calculations related to a weaving machine, Different types of fabric defects their causes and remedies.

**Shuttle Less Weaving Machines-** Brief idea about Gripper, Rapiers, Air Jet and Water Jet Weaving Machines.

**REFERENCES:**

1. An introduction to Warping and Winding- Dr.M.K.Talukdar
2. Industrial Practice in Yarn Winding- NCUTE
3. Sizing : Material,Method & Machine – D.B.Ajgaonkar
4. Weaving Mechanism – N.N.Banerjee
5. Weaving Mechanism – Robinson & Marks
6. Modern Preparation and Weaving machine – A.Ormerod.
7. Weaving Calculation - Sengupta

**CPFT 8206 WOVEN FABRIC STRUCTURE (3-1-0)****Module- I****(5 hours )**

**Basic Concepts :** Importance of fabric structure, Notation of weave, Drafting plan, Peg plan and Denting.

**Module-II****(18 hours )**

Plain Weave and It's Derivatives , Ornamentation of plain woven structure, Drafting plan, Peg plan and Denting, Application of these weaves in Fabrics.

Twill weaves and it's Derivatives, Ornamented twill and Sheded twill), effect of twist on prominence of twill lines. Drafting plan, Peg plan and Denting ,Application of these weaves in fabrics.

Satin and Sateen weaves, Crepe weave, Honeycomb, Mock leno, Huck-a-back, Bedford Cord, Cork Screw, Diamond, Welt and Pique fabrics.

**Module-III****(8 hours )**

**Decorative Weaves :** , Extra Warp and Extra Weft figuring. Backed Cloth (Warp and Weft with wadding effect), Double Cloth ( Self stitch and centre stitch), Pile fabric (Warp and Weft).

**Module-IV****(9 hours )**

CAD : definition of CAD, its application and uses. Advantage of using CAD in textile design. Fabric cover factor and Areal density calculation.

## **REFERENCES:**

1. Grammar of Textile Design: H. Nisbet
2. Textile Design and Colour-Watson
3. Advanced Textile Design - Watson
4. Fabric Structure and Design - N. Gokaneshan
5. Woven Cloth Construction - Marrys and Robinson
6. Design of Woven Fabric - MIR Publication
7. Textile Design - W. S. Murphy

## **CPFT 8207 INTRODUCTION TO WET PROCESSING (3-0-0)**

### **Module-I**

**(8 hours )**

Elementary ideas on the sequence of wet processing textiles.

Natural and added impurities in grey cotton , wool, silk and synthetic fibres. Introduction to various preparatory processes for cotton, silk, wool, polyester, nylon, acrylic and blended fabrics including optical whitening . Brief outline on mercerization , heat setting process

### **Module-II**

**(10 hours )**

Classification of Dyes; Introduction to Dyeing process for different fabrics of natural and synthetic fibres with important class of dyes i.e direct, acid, basic , vat ,azoic, reactive and disperse dyes.

### **Module-III**

**(6 hours )**

Introduction to printing process. Various ingredients for preparation of printing paste.Different methods and style of printing.

### **Module - IV**

**(6 hours )**

Introduction to Finishing of fabrics of natural and synthetic fibres : Importance and Classification of finishing.

Mechanical finish: Calendaring ; Sanforizing.

Chemical finish: Brief outlines on softening and stiff finish, water proof and water repellent finish; flame retardant and fire proof finish; Moth proof finish; Objects and method of heat setting of synthetic fabrics.

## **REFERENCES:**

1. Chemical Technology of Scouring and Bleaching: E. R. Trotman, Griffin.
2. Handbook of Bleaching: V.A. Shenai, Sevak Publication,
3. Technology of Dyeing : V.A.Shenai , Sevak Publication.

4. Dyeing & Chemical Technology of Textile Fibres : E. R. Trotman,
5. Chemistry of Dyes and Principle of Dyeing : V.A.Shenai , Sevak Publication
6. Technology of Dyeing : V.A.Shenai , Sevak Publication.
7. Textile Printing: L.W.C. Miles
8. Technology of Textile Printing: R. S. Prayog
9. An Introduction to Textile Finishing: J. T. Marsh
10. Technology of Textile Finishing: V. A. Shenai

## **CPFT 8208      GARMENT MANUFACTURING – I (3-1-0)**

### **Module – I (5 hours)**

**Garment Classification :** Men, Women and Children, Specifications and test, Fabric Selection: selection of fabric according to dress style, occasion, figure.

### **Module- II (15 hours )**

**Tracing and marking terminology-** Chalked marking, chalked thread, colour coding ,pin marking, tailors tacks ,thread tracing.

The Planning, Drawing and Reproduction of the marker, Requirement of the marker planning Efficiency of marker plan, methods of marker panning and marker use.

**Spreading :** The requirements of the Spreading process, methods of spreading,garment characteristics ,.Spreading mode analysis- Hand spreading, spreading equipment and its ,controls.

**Cutting :** The objectives of cutting, analysis of cutting mode. and lay out. technique of cutting in relation to quality and affectivity. Bundling- labeling. Cutting room layout, cutting room organization.

Tools & equipment for cutting – Band knife,clamp,click press,electrical cloth notch, Straight knife cutter, Circular knife, portable rotary knife cutter, Cutting Board, Cutting Table, Drill,Pattern perforator,Scissors, Shears .

### **Module- III (10 hours )**

**Seam terminology** – Inside curved seam, Outside curved seam, enclosed seam,exposed seam, extended seam allowances, intersecting seam, Rolled seam edges.

**Classification of different types of seam** – Plain seam Flat seam, French seam, Edge seam, Pico seam, Flat fell seam, Run and fell seam, lapped seam, Bound seam, Butted seam, Corded seam, Slot seam, piped seam, fused seam, glued seam, Padded seam,Seams of fur, Seam of lace, Top stitched seam, Tucked seam, Welt seam, Taped seam, Zigzag seam, Safety stitched seam

**Seam finishing** – different methods.

## **Module- IV**

**(15 hours)**

### **Basic Sewing techniques :**

**Hand stitches** - Hand stitch needle , Back stitch ( Half back, Prick) , Blanket stitch, Blind stitch, Catch stitch, Felling stitch, Pick stitch ,saddle stitch, Button hole/eyelets.

Over hand stitch, Running stitch, Hemming.

**Machine Stitches** – Chain stitch, Blind stitch, Hemistitch, Lock stitch, Zigzag stitch, Over edge machine stitch, Picot edging, Safety stitch, Lettuce edging. Shirring stitch, Elasticised Shirring.

**Sewing Machine** – different parts of Sewing machines and working principle, care and maintenance

### **Books for References:**

1. Apparel Manufacturing hand book — Jacob Solinger.
2. Clothing Technology – R.L. Friend
3. Clothing Technology – Carr & Latham
4. The Technology of Clothing Manufacture – Carr and Latham

## **CPFT 8210 PATTERN MAKING - I (3-0-0)**

### **Module – I**

**(8 hours)**

Principle of pattern construction, Importance of paper pattern, Types of paper pattern Terminology used in Pattern making .

### **Module - II**

**(15 hours)**

#### **Detailed study of the following for pattern construction –**

Measurement and its importance, Method of taking important body measurements for gents and ladies garment, no. of components required, Style feature, Lay out of pattern Estimation of materials, variation of patterns, Paper pattern.

### **Module – III**

**(12 hours )**

#### **Methods of making pattern**

a) Drafting b) Flat pattern Technique c) Draping

#### **Principles of drafting**

**Drafting of bodice block, sleeve block** – for Child and Adults, Drafting of collars, waistlines, skirts, necklines, cuffs, facings, Pleats, Tucks, Frills, Yokes.

Techniques used in flat pattern method.

Introduction to Draping, Principle of draping, Design aspect of draping.

### **REFERENCES:**

1. Easy Cutting – By Ball & Co.
2. Pattern designing and drafting – Ball & Co.

## **PRACTICALS**

### **CPFT 9203 FABRIC MANUFACTURING LAB. (0-0-2)**

1. Study of passage of yarn through various parts of winding machine (Warp and Weft).
2. Study of passage of yarn through direct and sectional warpers.
3. Study of passage of yarn through slasher sizing machine.
4. Study of tappet shedding mechanism
5. Study of Different picking mechanisms.
6. Study of Beat-up and Timming Circle.
7. Study of 5 & 7 wheel take up mechanism.
8. Study of the let off and loose reed mechanism.
9. Study of fast reed and warp stop motion
10. Study of dobby and jacquard
11. Study of Drop Box.
12. Study of shuttle less loom

### **CPFT 9204 PATTERN MAKING AND GARMENT CONSTRUCTION LAB. - 1 (0-0-2)**

#### **PATTERN MAKING:**

1. Developing and creating different patterns by using of 3 techniques.  
i) Drafting, ii) Flat Pattern Technique, iii) Draping
2. Drafting basic bodice blocks for Child and Adult  
Face, Back, sleeves, skirt, seam allowances.
3. Developing the basic blocks, marking information in block.
4. Creating different patterns  
Sleeves, Skirts, Collars, Yokes, Pleats.
5. Making of paper pattern of any garment and design adapting drafting.

#### **GARMENT CONSTRUCTION**

1. Study of the Sewing machineries, different tools. and its control
2. Preparation of sample of basic stitches .
3. Preparation of sample of different types of seam
4. Preparation of sample of different types of pockets
5. Preparation of sample of different types of Plackets
6. Preparation of sample of different necklines using facing and piping.
7. Preparation of sample of different button hole.
8. Making of sample of different cut and stitch - Kid/ladies/gents.

## CPFT 9205 DESIGN IDEA AND FASHION COORDINATION LAB. (0-0-2)

### Designing and sketching the following

1. **Types of Necklines** : Jewel, Round, U Neck, V-Neck, Scoop, Sweet heart, off shoulder, Off one shoulder , boat.
2. **Sleeves** : plain, bush shirt, puff, leg-o-motion, cap half cop, ruffle, megxar, dolman, kimmo, raglon, kurta, shirt, tulip, hanky.
3. **Collars** : petar pan, flat, cape, wing, high bias, low bias, chines, mandrain, shirt, tennis, chesea, silors, bishop, Bowtie, Shawl, Coat, Cowl.
4. **Skirts** : Gathered, pkated, Gored, Novelty, Layered, tulip, peg wrap around, pencil, draped, jumper suspende.
5. **Trousers** : Boyshorts, Jamica shorts, Bermunda, Ducker pants, capri, classic, Jeans, Jumpsuit or Dungicee, Cullotes.
6. **Yokes** : round, U shaped, Triangle, Pointed edge, square, straight, Asymmetrical saddle.
7. **Pleats** : Knife pleats, Kick pleat, Box pleat, Inverted pleat, Accordion , sunray.
8. **Tucks** : Pin, Spaced, Cross, Blind, Skeu.
9. **Waistlines** : Normal, Low, Empair.
10. **Pockets** : Patch, flap, round, slit, cross, wett, straight or side seam.
11. **Silhouettes** : A line, straight shift, princess line. Tunic,  
(Collect minimum 3 picture cutting of all these fashion details from fashion magazines and make a fulder)

### DESIGNING ASSIGNMENT

1. Theme-Kitchenwear  
Garment-Apron  
Fabric-Cotton stripe, Checks, dots, small points,  
pecial Feature: Patch pockets and applique work  
No. of doing-6
2. Garment-Forck  
Fabric-Cotton  
Age-2-5 years  
Occasion-Summer casuals  
Special feature: Xokes  
No. of design-6
3. Garment-TOPS  
Fabric-Suitable material  
Age: 13-19 Yrs  
Occasion-Summer Casual  
Special Future: Tucks  
No. of design-6
4. Skirts, Tops, 5. Unisex shirts, 6. Dresses (Waistlines)
7. Saree and Blause (Handloom), 8.Trouser, 9. Nightwear

## 6<sup>th</sup> Semester

### HSSM 4302 PRODUCTION AND OPERATIONS MANAGEMENT (3-0-0)

**Objective :** This course aims at acquainting all engineering graduates irrespective of their specializations the basic issues and tools of managing production and operation functions of an organization.

#### Module I

(11 hours)

1. Operation Function in an Organization, Manufacturing Vrs Service Operation, System view of Operations, Strategic Role of Operations, Operations Strategies for Competitive Advantages, Operations Quality and Productivity Focus, Meeting Global Challenges of Production and Operations Imperatives.
2. Designing Products, Services and Processes New Product Design : Product Life Cycle, Product Development Process, Product Quality and Reliability Design, Process Technology : Project , Jobshop, Batch, Assembly Line, Continuous Manufacturing, Process Technology Life Cycle, Process Technology Trends; FMS, CIM, CAD, CAM, GT, Design for Services, Services Process Technology, Services Automation. Value Engineering, Standardization, Make or buy Decision.
3. **Job Design and Work Measurement, Method Study** : Techniques of Analysis, recording, improvement and standardization. Work Measurement : Work Measurement Principles using Stopwatch Time Study, Predetermined Motion Time Standards and Work Sampling, Standard Time Estimation.

#### Module II

(7 hours)

4. **Location and Layout Planning** : Factor Influencing Plant and Warehouse Locations, Impact of Location on cost and revenues. Facility Location Procedure and Models : Qualitative Models, Breakeven Analysis, Single Facility, Location Model, Multi-facility Location Model, Mini max Location, Total and Partial Covering Model.  
**Layout Planning** : Layout Types : Process Layout, Product Layout, Fixed Position Layout Planning, Systematic Layout Planning, CRAFT.Group Technology and Cell Formation, Rank Order Clustering Method for Machine –Component Assignment,. Line Balancing : Basic concepts, General Procedure, Rank Positional Weight Method.
5. Forecasting : Principles and Method, Moving Average, Double Moving Average, Exponential Smoothing, Double Exponential Smoothing, Winter's Method for Seasonal Demand, Forecasting Error Analysis.

#### Module III

(8 hours)

6. Manufacturing Planning and Control : The Framework and Components : Aggregate Planning, Master Production Scheduling, Rough-cut-Capacity Planning, Material Requirements Planning, Capacity Requirements Planning, Shop Order System and

Purchase Order System. Transportation Method for Aggregate Production Planning, Material Requirement Planning, Scheduling and Dispatching Functions, Progress Monitoring and Control.

7. Sequencing and Scheduling : Single Machine Sequencing : Basics and Performance Evaluation Criteria, Methods for Minimizing Mean Flow Time, Parallel Machines : Minimization of Makespan, Flowshop sequencing : 2 and 3 machine cases : Johnson's Rule and CDS heuristic. Jobshop Scheduling : Priority dispatching Rules.
8. Inventory Control : Relevant Costs, Basic EOQ Model, Model with Quantity discount, Economic Batch Quantity, Periodic and Continuous Review Systems for Stochastic Systems, Safety Stock, Reorder Point and Order Quantity Calculations. ABC Analysis.

#### **Module – IV**

**(11 hours)**

9. Project Management : Project Management through PERT / CPM. Network Construction, CPM, Network Calculation, Crashing of Project Network, Project Scheduling with Limited Resources. Line of Balance.
10. Modern Trends in Manufacturing : Just in Time (JIT) System; Shop Floor Control By Kanbans, Total Quality Management, Total Productive Maintenance, ISO 9000, Quality Circle, Kaizen, Poke Yoke, Supply Chain Management

#### **REFERENCES:**

1. J. L. Riggs : Production Systems : planning Analysis and Control, John Wiley.
2. E. E Adam and R. J. Ebert “ Production and Operation Management”, Prentice Hall of India, 2004.
3. S.N. Chary, “ Production and Operations Management”, Tata McGraw Hill.
4. R. Paneerselvam, “Production and Operation Management, Prentice Hall of India, 2005.

### **CPFT 8209 GARMENT MANUFACTURING - II (3-1-0)**

#### **Module- I**

**(10 hours )**

**Sewing needles** – their type , characteristic and use.

**Sewing threads** – fibre types, thread composition , thread finishes , thread properties and their relationship with needles.

Sewing Machine feeding mechanism and sewing machine beds.

#### **Module – II**

**(15 hours )**

**Detailed Knowledge on different kind of Stitching machines** – Chain, lock ,blind, zigzag, button hole, multineedle and multithread Stitching m/c, their mechanism , function .and different parts.

**Principle and utility of the following machine used in garment manufacturing –**

Bar tacking machine, Over edging m/c, Interlock m/c, Double need high speed m/c, Button attaching and button hole making m/c.

**Trims and use of other components :** Labels and motif, Lining, Interlining, Wadding ,Lace, Braid , Elastic, Hook and loop fastening, Zip Fasteners, Buttons, Shoulder pad, Tuck button, snap fastener etc.

Defects and remedies, Care and maintenance of sewing machines.

**Sewing problems :** Problems in stitch formation, problems of pucker, problems of damage to the fabric along the stitches.

**Module – III (10 hours )**

**Pressing :** Need of pressing, Types of pressing, Pressing equipments and methods, Pleating , State of pressing. Garment finishing machines.

**Fusing Technology :** Requirement of fusing, method of fusing, Fusing process.

**Module – IV (10 hours )**

**Introduction to Garment Factory -** Small and large garment manufacturing firms, Production ,Planning and Control at each and every stages of garment manufacturing from Raw material sourcing ,pattern making , cutting ,stitching to finishing.

**Packing :** different types of packing, packing materials, labels and tags.

**REFERENCES:**

1. Apparel Manufacturing hand book — Jacob Solinger.
2. Clothing Technology – R.L. Friend
3. Clothing Technology – Carr & Latham
4. The Technology of Clothing Manufacture – Carr and Latham

**CPFT 8211 PATTERN MAKING-II (3-1-0)**

**Module – I (8 hours)**

**Darts :** Principle of Basic darts, Relocation of darts – Pivot method, ii) Slash method  
iii) Measurement method.

**Fullness :** Introduction to fullness in pattern making and its importance, Types of fullness – Gathers Tucks,Flares,Glored & gadet, Gowel

**Yokes :** Uses of yokes in pattern making, , Types of yokes- with fullness and without fullness.

**Princessline :** Introduction to Princessline and its importance, Type of princessline.

**Fitting :** Principle of good and bad fitting – Ease,Linc, Grain, Set, Balance , Steps to solve the fitting problem

**Pattern Alteration :** Foundation pattern, Types of pattern - Flat or Draped pattern, Step to alter pattern for the required body measurement.

**Module II (8 hours )**

Pattern layout and cutting, Ruler to consider in pattern layout

Difference types of pattern layouts

State Grading-types of grading, study of grading of various top and bottom garments.

Computer aided pattern making and grading.

Drafting of common garments, Alterations to patterns

Working with different fabrics.

### **Module – III**

**(14 hours)**

#### **Study of the Pattern construction of the following garment :**

Zabala with and without sleeves, Baby bonnet and neck bib, Frocks, Blouse , Punjabi set ( latest style ), Banian, Inner garment, Sports wear, T-Shirts, Leg garment - Bermuda, Jumpsuit, Trousers, Coat , Jacket, Safari suit, Nighty etc

### **REFERENCES:**

1. Easy Cutting – By Ball & Co.
2. Pattern designing and drafting – Ball & Co.
3. Pattern making – Powell & Jeanne.
4. Pattern making for fashion designing- H.J Armstrong.
5. Pattern drafting – Rohr. M

## **CPFT 8212 TEXTILE AND GARMENT TESTING (3-1-0)**

### **Module –I**

**(10 hours)**

**Yarn dimension :** Yarn linear density-direct and indirect system; Conversion from one system to another, Measurement of yarn count, linear density of plied and cable yarn, Yarn twist – Type of twist it's measurement technique.

**Yarn evenness** – Importance of yarn evenness and instrument used for its measurement - capacitance type, photoelectric type. Definitions of yarn hairiness. ASTM yarn grading.

### **Module-II**

**(15 hours)**

Dimension and physical properties of fabrics. Measurements of different dimensions properties - length, width ,thickness, weight / area, threads / unit length, crimp, stiffness, crease recovery, drape, fabric cover and fabric handle, shrinkage, air permeability, water permeability, Abrasion and pilling resistance of the fabric, Thermal insulation, flammability .

### **Module-III**

**(10 hours)**

**Mechanical properties of Textiles :** Characterization of mechanical behavior of textiles; stress- strain curve; mechanics of CRT, CRE & CRL type testers and their comparisons, Measurement of Mechanical **Properties of Textiles** – Yarn tensile strength and elongation. Fabric strength testing - Tensile strength, Tearing strength, Bursting strength of cloth.

**Module-IV****(10 hours )**

**Garment Testing :** Dimension stability, Tensile strength ( Grab), tearing strength, Seam strength , Seam slippage, Adhesion between interlining and fabric, Shrinkage . and other requirement as per end use.

**Chemical Testing :** - Fibre composition, Colour fastness to washing,light,rubbing, saliva perspiration ,water etc.

Eco- parameters requirement for garment.

**REFERENCES:**

1. Principle of Textile Testing: J.E. Booth
2. Textile Mathematics, Vol-I, II, III : J. E. Booth
3. Textile Yarn: B. C. Goswami
4. Physical Methods of Investigating Textiles: Meredith and Hearle
5. Finishing of Garments and Knits - NCUTE Publications.

**CPFT 8213 GARMENT PROCESSING & FINISHING (2-1-0)****Module – I****(3 hours)**

**Brief study on Machineries for dyeing of Fabric** - Jigger, Padding Mangle, Winch, H.T.H.P dyeing, Jet dyeing machine, their functions and uses.

**Module – II****(8 hours)**

**Garment Dyeing : Garment dyed items** – knitted and woven, Sequence of wet processing of cotton garments, Dyeing processes and fastness properties. Garment ,Dyeing Machineries – paddle, rotary drum and tray dyeing machine. Sequence of wet processing of woollen and silk garments - Dyeing processes and machineries.

**Module – III****(4 hours)**

**Garment Printing** – Study of different type of printing used on Garment – Khadi Printing. Plastic Printing, Foam Printing, ,Metallic Printing, Flurosent Printing, Flock Printing, Reflective Printing, Pearl Printing, Reflective Printing, Glitter Printing, Plastizol Printing, High Density Printing Transfer Printing etc.

**Module – IV****(10 hours)**

**Garment Finishing** – Finishing process for garments made of woven fabric, Process for finishing garment made of denim fabric, Finishing of Knitted Garment, Enzyme Finishing for garments, Garment Finishing machinery, Emerging Technology and Trends in Garment

finishing, Fire retardant finish for garment., Functional finishing of garment for specific use-medical application, environ protection, space application ,marine application, sports application, defence application etc.

### **Module - V**

**(5 hours)**

**Care of Garment** – Suitable techniques for removal of stains on clothing (due to coffee, tea, curry, blood, oil, ink, mildew, paints, rust, etc. Techniques of Dry cleaning for clothing of different textile fibre, Equipment in laundering. Use of washing machine. Indigenous Laundering agent and their uses.

### **REFERENCE BOOKS:**

1. Dyeing and Chemical Technology of Textile Fibres E. R. Trotman
2. Technology of Bleaching, V. A. Shenai
3. Technology of Dyeing, V. A. Shenai
4. Finishing of Garments and Knits, NCUTE Publication.
5. Finishing of Garments & Knitwears, NCUTE pilot programme
6. Garment Manufacturing Technology, NCUTE Publication
7. The care of Textile Product, Phyllis G.Torota

## **CPFT 8214 KNITTING TECHNOLOGY & KNITWEAR DESIGN (3-0-0)**

### **Module - I**

**(5 hours)**

Definition of knitting, General Description of Knitting Machine - Flat & Circular , Characteristics of Warp Knit & Weft Knit structure , Knit, Tuck & Float Stiches & their uses. Knitting Needles - Latch beard & compound, Knitting Cycle.

### **Module-II**

**(10 hours)**

**Basic weft Knitted structure** - Plain, Single jersey, double jersey, Rib , Interlock & Purl - their characteristics & uses in detail, ornamentation, derivatives of the structure & their properties, transfer of loops, structure based on Rib , interlock gaiting . Principles of knitting socks, half-hose, panty hoses and gloves.

### **Module-III**

**(6 hours )**

Warp Knitted Structure from Tricot Warp Knitting Machine like- half tricot, Full tricot, lock knit, reserve lock knit, Queen's card, Satin, Atlas, Inlay etc.

### **Module-IV**

**(9 hours )**

Patterening devices for Weft knitted structure including Electronic jacquard.

Knitted garments - Fully cut, Cut Stitch Shaped, Fully fashion, Integral garments.

Spreading & cutting of Fully cut, Cut Stitch Shaped garments.

Garment production in flat bed knitting machine

## **REFERENCE BOOKS :**

1. Knitting Technology, D. J. Spenner
2. Knitting Technology, H. Wirnatt
3. Introduction to Weft Knitting, J. A. Smirfitt
4. Knitting, H. Wingall

## **PRACTICALS**

### **CPFT 9206 PATTERN MAKING AND GARMENT CONSTRUCTION LAB. – II (0-0-3)**

1. Drafting of different unisex garment (Kids)
2. Style variation of dart manipulation
3. Drafting of some garments
4. Grade Paper-Pattern to various sizes according to body measurements.
5. Make paper alteration to solve any fitting problems.
6. Make draping of stylized garments.

#### **Garment Construction :**

1. Make samples of top garments
2. Make samples of sleeves
3. Make sampler of different skirt
4. Make sampler of such children.s garment.
5. Make sampler of such garments by using handloom fabrics.

#### **Cut and Stitch**

1. Ladies top with yoke as a special feature
2. Ladies evening dress
3. A traditional Indian Garment.
4. Gents Kalidar Kurta
5. Gents Shirt
6. Ladies Coat

### **CPFT 9207 TEXTILE AND GARMENT TESTING LAB. (0-0-2)**

#### **YARN TESTING**

1. To determine the yarn count
2. To measure twist of single and double yarn.

3. To measure the single yarn strength and elongation % at break of a given yarn
4. To measure U % and imperfection by KET. (Only Demonstration)

### **FABRIC TESTING**

5. To find out the cover factor and GSM of a given fabric sample .
6. To find the tensile strength and tearing strength of given fabric sample
7. To find the tearing strength of given fabric sample
8. To find the abrasion resistance of a fabric by Martindale Abrasion Tester
9. To find the crease recovery, Flexural rigidity and bending length of a given fabric/garment Sample.
10. To find the drape and thickness of a given fabric sample.
11. To measure the dimensional stability of a given fabric / Garment sample.
12. To measure the seam strength of garment.
13. To determine the blend composition of fabrics used for garment.

### **CPFT 9208 WET PPROCESSING & FINISHING OF GARMENTS LAB . (0-0-2)**

1. Desizing, and Scouring of Cotton yarn / Fabric.
2. Bleaching of Cotton yarn / Fabric with Bleaching powder.
3. Bleaching of Cotton yarn / Fabric with Hydrogen Peroxide.
4. Degumming of Silk
5. Scouring and Bleaching of Wool.
6. Dyeing of cotton yarn/fabric by Direct, Reactive, Vat, Azoic and Sulphur Dyes.
7. Dyeing of Wool yarn / fabric.
8. Dyeing of Silk yarn / fabric
9. Measurement of fastness properties to washing, light ,rubbing of dyed garments.
10. Printing of fabric using hand block /screen printing method.
11. Finishing of the Garment using various techniques

**COURSE STRUCTURE  
THIRD YEAR B.TECH PROGRAMME  
FASHION TECHNOLOGY**

<b>7<sup>th</sup> Semester</b>			<b>8<sup>th</sup> Semester</b>		
<i>Theory</i>	<i>Contact Hrs.</i>	<i>Credit</i>	<i>Theory</i>	<i>Contact Hrs.</i>	<i>Credit</i>
		<b>L-T-P</b>			<b>L-T-P</b>
CPFT 4401 Computer Aided design-I	3-0-0	3	CPFT 4405 computer aided Design-II	3-0-0	3
CPFT 4402 Embroidery & surface Ornamentation	3-0-0	3	CPFT 4406 Apparel Marketing & merchandising	3-1-0	4
CPFT4403 High tech Garment	3-0-0	3	CPFT 4407 Process Control in Apparel Manufacturing	3-1-0	4
CPFT 4404 Apparel Production Planning & scheduling	3-1-0	4	ELECTIVE-II		
ELECTIVE-I			a. PEFT 4403 Product Design & Development	3-0-0	3
a. PEFT 4401 Fashion Selection	3-0-0	3	b. PEFT 4404 Traditional Fabric & Their Products		
b. PEFT 4402 Home Textiles			ELECTIVE-III	3-0-0	3
<b>Total</b>		<b>16</b>	PEFT 4405 Entrepreneurial Development		
			PEFT 4406 Export Management		
			<b>Total</b>		<b>17</b>
<i>Practicals/Sessionals</i>	<i>Contact Hrs.</i>	<i>Credit</i>	<i>Practicals/Sessionals</i>	<i>Contact Hrs.</i>	<i>Credit</i>
CPFT 9401 CAD Lab. –I	0-0-3	2	CPFT 9405 Project Work	0-0-5	5
CPFT 9402 Embroidery and surface Ornamentation Lab.	0-0-3	2	CPFT 9406 Entrepreneurships Project	0-0-3	2
CPFT 9403 Design Collection	0-0-3	3	CPFT 9407 Seminar	0-0-2	1
CPFT 9404 Industrial Internship and Seminar		2	CPFT 9408 Comp. Viva	0-0-3	2
		<b>9</b>			<b>10</b>
<b>Total</b>		<b>25</b>	<b>Total</b>		<b>27</b>

**L-Lecture**

**T-Tutorial**

**P-Practical**

## **CPFT 4401 COMPUTER AIDED DESIGN-I (3-0-0)**

### **Module-I (5 hours)**

Fundamentals of CAD-Definition, Hardware &Software requirement of CAD. Design process ,Application and use, Creating the manufacturing Data base & benefits of CAD.

### **Module-II (5 hours)**

Hardware in CAD: Introduction, Design work station, Graphics terminal, input &output devices, central processing unit &secondary storage

### **Module-III (5 hours)**

Computer graphics software &database: Introduction ,Software configuration of a graphic system, function of a graphic package, Extruding, Transformation, Corel draw, Adope photoshop,

Data base structure & content, wireframe vs solid modeling .

### **Module-IV (5 hours)**

Basic drawing techniques: Drawing line, Circle, Rectangle, Arc, Polyline, Elipse, Elliptical Arc , Polygon, Doubts, Creating point objects, Changing point styles, Free hand sketching, Removing objects, Displacing, Duplicating, Orientation, Controlling size ,Partial removal, Changing size in one direction.

### **Module-V (5 hours)**

Entry grip corner rounding & chamfering, Opening, Drawing ,Drawing units & scales, Drawing limits & sheet size, Drawing display control, assigning colour and line-type to object, Transparent overlays.

### **Module-VI (5 hours)**

Profile generation: Enhancement drawing, parameter alteration , feature based design process. Dimensioning a sketch, GEOMETRICAL features, modifying features , parametric dimensioning.

### **REFERENCE BOOK:**

1.CAD/CAM by Groover & zimmer

## **CPFT 4402 EMBROIDERY AND SURFACE ORNAMENTATION (3-0-0)**

### **Module-I (7 hours)**

Basics principles of hand embroidery, m/c embroidery , computer embroidery. Embroidery kits, tools, & equipment for embroidery.

### **Module-II (8 hours)**

Stitch families: Straight stitch, looped stitch, knotted, laid, couched and cross stitch.

Embroidery pattern:

Embroidered pattern used to decorate interior spaces, cushion, table cloth  
Curtains, matts, traditional accessories.  
Embroidered pattern used for female wardrobe, shawls, belts, handkerchief  
Head scarves etc

**Module-III** **(5 hours)**

Regional embroidering: Study motifs, fabrics, colour threads, stitches used for design in Sind & Gujrat, Punjab, Bengal, Karnataka, U.P.  
Embroidering with gold & silver thread:Material used, Ancient method of creching.

**Module-IV** **(8 hours)**

Patch work:Applique design, drawn & thread work,raised work, quilting, varios method and refilling the open spaces  
Tapestry weaving:Principles, appliances and materials, mirror, bobbins & needles comb, embroidery frames treated as a loom.

**REFERENCES:**

- 1.Encyclopedia of embroidery by Reader digest
- 2.Traditional Indian textiles-John Gillow
- 3.USHA & SINGER publication on embroidery

**CPFT 4403 HIGH TECH GARMENT (3-0-0)**

Study of the Basic Principle of manufacturing technology and functional Properties of Garment used for specific purpose.

**MODULE –I** **(15 hours)**

Smart Garment: Chameleonic Garments, Communicative Garment, Shape memory Garment, Responsive Garment.  
Protective Garment : Thermal protective Garments , Protective clothing from x-rays, gamma chamber, Bullet proof, space suits, water proof & water breathable fabric etc.

**MODULE –II** **(10 hours)**

Garment for medical & hospital use, Antimicrobial textile wear, Pathogen resistant surgical gown.  
High performance Sports wear.

**MODULE –III** **(10 hours)**

Wearable electronics: Musical Jacket, Garment fitted with electronics appliances like torch, mobile, calculator, motherboard etc.

**REFERENCE:**

1. Industrial Textile by Sabit Adnoor.

## **CPFT 4404 Apparel Production Planning & Control Scheduling (3-1-0)**

### **MODULE –I**

**(10 hours)**

1. Introduction to production ,Operations ,Concept of production, Productivity components of production
2. Production planning & control , its Objective ,function & organization of various departments in apparel industry

### **MODULE –II**

**(10 hours)**

3. Production planning order preparation,material planning ,process planning ,loading & scheduling in apparel industry
4. Work measurement : Uses of work measurement, data, basic procedure of work measurement.

### **MODULE –III**

**(15 hours)**

5. Motion & Time study : Definition & scope of motion & time study, Data for sewing work study , improvement of production efficiency, Production analysis ( qualitative & quantitative) .
6. Co-ordination of activities: Layering & marker planning , Cutting room planning, planning of sewing room, Material management in clothing production Quick response in apparel manufacturing . Different production system.

### **REFERENCES:**

1. Introduction to clothing production management : A.J. Chutter
2. production management in apparel industry : Rajesh Bheda

## **ELECTIVE-I (3-0-0) PEFT 4401 FASHION SELECTION**

### **MODULE –I**

**(10 hours)**

1. Division of garment in respect to age group for kids wear- popers, liberty, bodice, swaddling set, rompers, dunes, jumper etc. Development and adaption guidelines for basic blocks for kids. various prints used for kids- Nursery prints, baby prints etc.

### **MODULE –II**

**(15 hours)**

2. Designing for women's wear- blouse, skirt, trousers, evening wear, knit wear, fabric designing for women in stripes.

3. Designing of men's wear- Shirts, trouser, jacket, waistcoat, over garment, leisure wear, knit wear, fabric designing for men in checks.

### **MODULE –III**

**(10 hours)**

4. Fashion selection- selection of fabric, color, design, styles for infant, children, teenager, men, women, in respect to climate, region, culture, religion.
5. selection of accessories and furnishing for men and women wear.

### **REFERENCES.**

1. Fabric form and flat pattern cutting- Winifried
2. Fashion source Book.- Mikelvey
3. Inside fashion design- Tate
4. textile and fashion- Mote

## **ELECTIVE-I PEFT 4402 HOME TEXTILE (3-0-0)**

### **Module-1**

**(10 hours)**

1. Classification of Textiles: Clothing, Home furnishing and Technical Textiles
2. Introduction to furnishing fabric:
  - Classification based on end use & application
  - Properties requirement
  - Raw material used

Manufacturing process, product specification, property & performance requirement  
Of the following home textiles

### **Module-II**

**(10 hours)**

3. Floor and wall covering- carpets, rugs/durries, cushion, pads, wall hanging and decoratives.
4. Home decorative
  - Draperies, Curtains, Sofa and car sheets, Accessories, process parameter and technique used to produce these fabrics

### **Module-III**

**(10 hours)**

5. Bed linen- Bed covers, pillow covers, mattress and blanket cover
6. Kitchen linen :  
Disc cloth, cheese cloth, hand towel, freeze cover, covers for other appliances such as tea kettle cover, table cloth, kitchen apron,  
Wipers- woven & non woven wiper

## **REFERENCE:**

1. Textile & Clothing -Garg, Saini, Gupta

## **7<sup>th</sup> SEMESTER PRACTICAL**

### **CPFT 9401 COMPUTER AIDED DESIGN LAB-I (0-0-3)**

- 1-Introduction to graphical representation- live graphics, pixel graphics. Graphic system & peripherals. Graphic formats, file conversion initiatives.
- 2- Graphic system & peripherals. Graphic formats, file conversion initiatives.
3. Drawing of graphics, pixel graphics. Graphic system & peripherals. Graphic formats, file conversion initiatives. map geometric figures.
4. Implementation of various aspects & commands of Corel draw including 2D & 3D graphic design, Photoshop.
5. Drawing objects such as Line X lines, Rays, MULTILINES, Polylines, Rectangles, Polygons etc.
6. Drawing objects such as Circle, Ellipse, ARC
7. Drawing objects such as Rectangles, Polygons

### **CPFT 9402 EMBROIDERY LAB (0.0.3)**

1. Basic hand embroidery stitches.
2. Samples of machine embroidery stitches.
3. Mirror work.
4. Appliqué work.
5. Patch work.
6. Application of hand embroidery stitches on any product (handkerchief, cushion cover etc.)
7. Making a product using machine embroidery.
8. Application of any embroidery on a dress.

### **CPFT 9403 Design Collection (0-0-3)**

### **CPFT 9404 Industrial Internship & Seminar**

## **8<sup>th</sup> SEMESTER**

### **CPFT 4405 COMPUTER AIDED DESIGN-II (3-0-0)**

#### **Module-1**

**(8 hours)**

1. Working principle of electronic dobby ,electronic jacquard & electronic punching m/c
2. Concept fabric design developing & their transfer to punching machine or transfer to electronic jacquard for direct weaving.

#### **Module-1I**

**(10 hours)**

3. Principles of motif generation on computers / motif for border ,motif for all over design.
4. Principles & elements of color , color selection & application through CAD

#### **Module-1II**

**(12 hours)**

5. Weave simulation ,Draping & 3D image on CAD ,Principles of Development of basic weave design & their derivatives
6. Operational principles of various tools of CAD software for woven ,knitted & Printed design, Principles of CAD for pattern making & Pattern grading , use of Anthropometric data for CAD based garment manufacturing , Computer Aided Cutting & sewing m/c

### **CPFT 4406 APPAREL MARKETING AND MERCHANDISING (3.1.0)**

#### **Module-1**

**(7 hours)**

Scope & potential of apparel product in domestic & International market exploration of fashion industry , marketing & Carriers within the industry ,Primary market ,producers of material , secondary market, design & production  
Present scenario of apparel industry in India – challenges & prospects of these industries

**Module – II** (5 hours)  
Foundation of marketing & Merchandising trade, causes of growth & benefits of culture, law etc. Instruments of trade policy

**Module – III** (10 hours)  
Introduction to retailing ,types of retailers & ownership, elements of retail mix, Store organization .Retailing market strategy & benefits of retail marketing ,analysis of area & site selection, layout planning & space allocation.  
Basic profit factor – The relationship of markup to profit. Retail pricing & repricing  
Inventory control

**Module – IV** (8 hours)  
International marketing environment ,identifying foreign apparel markets, International marketing mix- PLC model, pricing decision , channels of distribution. Models of entering foreign market for apparel export, Merits& demerits of each method.

**Module-V** (8 hours)  
Export procedure & documentation, export assistance- various scheme, sources of information , role of export promotion counseling, terms of payment, export finance.

**Module-VI** (7 hours)  
Working of export houses, categories – star trading export house. Out sourcing , apparel merchandising buying , merchandising planning. Visual merchandising .Brand & Brand Building. Business process of off –sourcing / out sourcing . Retailing & promotion of fashion.

### **REFERENCES:**

1. International marketing management – Vasshney & Bhattachary
2. Nabhi's Publication on export- Govt. Handbook
3. International marketing - Cateora

### **CPFT 4407 PROCESS CONTROL IN APPAREL MANUFACTURING (3-1-0)**

**Module-1** (5 hours)

1. Application of process control approach in apparel manufacturing through estimation of labor productivity, m/c productivity, quality and cost control

**Module – II** (10 hours)

2. Quality control parameters from raw fabric to finished garment for monitoring Process.
  - Monitoring of pattern making & grading.
  - Monitoring of cutting process
  - Monitoring of sewing, fusing and pressing process

**Module – III** (5 hours)

3. Quality parameters to be checked for finished garment to eliminate rejection.

**Module – IV** (5 hours)

4 . Control of accessories quality trims, thread, lining and interlining.

**Module – V** (5 hours)

5. Inspection, defects analysis and estimation of value loss both for fabric and Finished garment, classification of on 4-point system, 6-point system, 10-point System, major and minor defects, garment rejection.

**Module – VI** (15 hours)

6. Evaluation of sewing process to assist process control in apparel manufacturing  
-Evaluation of sew ability.  
-Evaluation of thread tension.  
-Evaluation of damage on thread, fabric needle for control of sewing speed, needle heating, thread tension.  
Knowledge on standard norms for various process and quality parameters.

### **REFERENCES:**

1. Managing Quality in the Apparel Industry. By Mehta & Bharadwaj.
2. Dress designing by Monmeet Sodhia.

## **ELECTIVE-II (3-0-0)**

### **PEFT 4403 PRODUCT DESIGN & DEVELOPMENT (3-0-0)**

**Module – 1** (8 hours)

Basic Principles of product development in apparels

- Artistic view point
- Engineering view point
- Fashion consideration
- Market factors

**Module – 2** (7 hours)

Evaluation and analysis of a new product –product costing , economic analysis, evaluation of portfolio of products or projects, market potential, sale, demand and cost .

**Module – 3** (5 hours)

Development of new product in textile ( Apparel sector) for various end uses.Study of quality requirement and product specification

- Requirement of comfort
- Requirement of hand
- Requirement of Aesthetics aspects.

#### **Module – 4**

**(8 hours)**

Modern Fabric evaluation technique to support product development : KES instrument, FAST instrument and other subjective and objective evaluation methods for assessing product performances.

#### **Module – 5**

**(7 hours)**

Knowledge of product specification and design details for gents , ladies and kids wear like – Suiting, Shirting,denims, salwar suit , choli, knit wear, Tie, Scarf etc.

### **REFERENCES:**

- I. Basic process and clothing construction: SHERIE DOONGALI
- II. Managing productivity in apparel industry: Rajesh Bheda
- III. 0Apparel manufacturing hand book : Jacob Solinger
- IV. Journals on Apparel Industry/Manufacturing

## **ELECTIVE-III**

### **PEFT 4405 ENTREPRENEURIAL DEVELOPMENT (3-0-0)**

#### **Module-1**

**(7 hours)**

1. Characteristics of Entrepreneur & Training: Entrepreneurship- Meaning- Characteristics- function of Entrepreneur- innovation-Risk taking, Management of Business- Training & Development- Entrepreneur Development programmer- Schemes etc.

#### **Module-1I**

**(8 hours)**

2. Project Formation & Finance to Entrepreneur: Identification of Business opportunities- Project ideas & Identification through Trade fair, Exhibition, Agencies- Role of agency- Incentives & subsidies.

#### **Module-1II**

**(7 hours)**

3. Selection of Project : Factors to consider for selection of a project Technology, Marketing, Labor , Location , Equipment- Project formulation , Identification- Trade

fair & Exhibition- Feasibility report- Content – small scale industry. Promotion- Pricing policy. Object of prices- Profit theory.

**Module-1V**

**(8 hours)**

4. Basics of Knowledge of Business Organization & Economics: Factors of production- Land, Labor, Capital, Enterprise- Forms of business organization Types: Sole traders, partnership, joint Hindu Family, company, co-operatives, Law of marginal utility, demand curve, demand schedule, Elasticity of demand, Supply-Law of supply .

**Module-V**

**(5 hours)**

5. Business regulation: Law of contract, Essential Element of contract- Sales of contract, Sales of goods, Sale & Agreement to sell, Contract of Agency- Classification Agency- Termination- INSURANCE- Tax- Procedure for Registration.

**REFERENCES:**

1. Entrepreneurial Development, P.Saravanavel.
2. Business organization – Bhusan Y.K.
3. Principle of economics – M.C.Seth
4. Organization & Management of small scale industry – Vasanth Desai

**PEFT 4406 EXPORT MANAGEMENT (3-0-0)**

**Module-I**

**(7 hours)**

Frame work of International marketing :

- Definition and scope of International marketing; International marketing versus Domestic marketing , cultural dimension of International marketing.
- Regional economic grouping.

Trends in India's Foreign Trade:

-A Review of trends; Trade policy since 1991 , Composition of India's Export and Import.

-India's trade policy: Medium term Export strategy 2002-2007, Export – Import policy 2002-2007.

**Module-II**

**(8 hours)**

Product planning for Export:

Need for product planning ,Product adoption & standardization, Product life cycle in international marketing, Packaging as an element of product planning.

**Module-III**

**(8 hours)**

Pricing for Exports:

Export pricing & cost factors Elements of cost for export price quotation  
Export pricing strategy ,Basic data required for export pricing decision.

**Module – IV**

**(7 hours)**

Market entry and overseas distribution system : \_

Methods of entry in a foreign market , export distribution channel  
Factors affecting channel decision .Role of export or trading houses

**Module – V**

**(5 hours)**

Promotion of products internationally, Nature & rule of international advertisement .Define promotional method

Overseas market research – need for market research , methodology of market research , conducting overseas market research

**Module – VI**

**(8 hours)**

Management of Risk in international marketing

Detail discussion of various types of risks involve in international market

**REFERENCES:-**

1. International marketing management - B.L. Bhattachar

**PRACTICALS**

**CPFT 9405 Project Work (0-0-5)**

**CPFT 9406 Entrepreneurship Project (0-0-3)**

**CPFT 9407 Seminar (0-0-2)**

**CPFT 9408 Comp. Viva Voce (0-0-3)**