College of Engineering and Technology (Autonomous), Bhubaneswar.

CURRICULUM STRUCTURE FOR UNDERGRADUATE PROGRAMME IN FASHION AND APPAREL TECHNOLOGY

2019

An autonomous and constituent college of Biju Patnaik University of Technology, Rourkela, Odisha.

FASHION TECHNOLOGY COURSE STRUCTURE
B. Tech. (AUTONOMOUS)
Duration: 4 years (Eight Semesters)

1st SEMESTER

Sl. No.	Subject Type	Subject Code	Subject Name	Teaching Hours/Week			Credit	Maximum Marks			
				L	T	P		IA	EA	PA	Total
1	Basic Science Course	UBSCH101	CHEMISTRY	3	1	0	4	30	70	0	100
2	Basic Science Course	UBSMH102	MATHEMATICS -I	3	1	0	4	30	70	0	100
3	Engineering Science Course	UESCS103	PROGRAMMING FOR PROBLEM SOLVING	3	1	0	4	30	70	0	100
4	Basic Science Course	ULCCH101	CHEMISTRY LAB	0	0	3	1.5	0	0	100	100
5	Engineering Science Course	ULCCS103	PROGRAMMING FOR PROBLEM SOLVING LAB	0	0	2	1	0	0	100	100
6	Engineering Science Course	ULCME104	ENGINEERING GRAPHICS AND DESIGN LAB	1	0	4	3	0	0	100	100
7	Mandatory Course	INDUCTION TRAINING(21 DAYS)					0				
			Total				**17.5**				**600**

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2nd SEMESTER

Sl. No.	Subject Type	Subject Code	Subject Name	Teaching Hours/Week			Credit	Maximum Marks			
				L	T	P		IA	EA	PA	Total
1	Basic Science Course	UBSPH111	PHYSICS	3	1	0	4	30	70	0	100
2	Basic Science Course	UBSMH202	MATHEMATICS-II	3	1	0	4	30	70	0	100
3	Engineering Science Course	UESEE113	BASIC ELECTRICAL ENGG.	3	0	0	3	30	70	0	100
4	Humanities &Social Sciences	UHSMH205	ENGLISH	2	0	0	2	30	70	0	100
5	Basic Science Course	ULCPH111	PHYSICS LAB	0	0	3	1.5	0	0	100	100
6	Engineering Science Course	ULCEE113	BASIC ELECTRICAL ENGG. LAB	0	0	4	2	0	0	100	100
7	Engineering Science Course	ULCME114	WORK SHOP/BASIC MANUFACTURING PROCESS LAB	1	0	4	3	0	0	100	100
8	HS	ULCMH204	ENGLISH LAB	0	0	2	1	0	0	100	100
			Total				**20.5**				**800**
9	**Summer Internship programme (4 to 8 weeks) is mandatory as per AICTE rule**										

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3rd SEMESTER

Sl. No.	Subject Type	Subject Code	Subject Name	Teaching Hours/Week			Credit	Maximum Marks			
				L	T	P		IA	EA	PA	Total
1	Core Course	UPCFT301	Fiber Science	3	0	0	3	30	70	0	100
2	Core Course	UPCFT302	Concept of Fashion	3	0	0	3	30	70	0	100
3	Core Course	UPCFT303	Yarn Manufacturing	3	1	0	4	30	70	0	100
4	Engg. Science Course	UESIT311	Data Structure and Algorithm	3	0	0	3	30	70	0	100
5	Basic Science Course	UBSMH301	Mathematics-III	3	1	0	4	30	70	0	100
6	Humanities Science Course	UHSMH301	Organizational Behavior	3	0	0	3	30	70	0	100
7	Lab Course	ULCFT301	Concept of Fashion Lab.	0	0	3	1.5	0	0	100	100
8	Lab Course	ULCIT311	Data Structure and Algorithm Lab.	0	0	3	1.5	0	0	100	100
			Total				**23**				**800**

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4th SEMESTER

Sl. No.	Subject Type	Subject Code	Subject Name	Teaching Hours/Week			Credit	Maximum Marks			
				L	T	P		IA	EA	PA	Total
1	Core Course	UPCFT401	Fashion Sketching and Illustration	3	0	0	3	30	70	0	100
2	Core Course	UPCFT402	Fashion Design and Color Theory	3	1	0	4	30	70	0	100
3	Core Course	UPCFT403	Fabric Manufacturing	3	0	0	3	30	70	0	100
4	Engg. Science Course	UPCIT403	Data Base Management System	3	0	0	3	30	70	0	100
5	Humanities Science Course	UHSMH401	Engineering Economics	3	0	0	3	30	70	0	100
6	Lab Course	ULCFT401	Fashion Sketching and Illustration Lab.	0	0	3	1.5	0	0	100	100
7	Lab Course	ULCFT402	Fashion Design and Color Theory Lab.	0	0	3	1.5	0	0	100	100
8	Lab Course	UPCIT403	Data Base Management System Lab	0	0	3	1.5	0	0	100	100
9	Mandatory Course	UMCCE401	**Environmental Science**	2	0	0	0	30	70	0	100
			Total				**20.5**				**900**
10	**Summer Internship programme (4 to 8 weeks) is mandatory as per AICTE rule**										

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5th SEMESTER

Sl. No.	Subject Type	Subject Code	Subject Name	Teaching Hours/Week			Credit	Maximum Marks			
				L	T	P		IA	EA	PA	Total
1	Core Course	UPCFT501	Garment Manufacturing Technology-I	3	0	0	3	30	70	0	100
2	Core Course	UPCFT502	Testing of Textile Materials	3	0	0	3	30	70	0	100
3	Core Course	UPCFT503	Embroidery and Surface Ornamentation	3	0	0	3	30	70	0	100
4	Core Course	UPCFT504	Indian Traditional Textile Design	3	0	0	3	30	70	0	100
5	Programme Elective-I	UPEFT505/ UPEFT506	Garment Processing and Finishing / Clothing Science and Technology	3	0	0	3	30	70	0	100
6	Open Elective-I			3	0	0	3	30	70	0	100
7	Lab Course	ULCFT501	Garment Manufacturing Technology-I Lab.	0	0	3	1.5	0	0	100	100
8	Lab Course	ULCFT502	Testing of Textile Materials Lab.	0	0	3	1.5	0	0	100	100
9	Lab Course	ULCFT503	Embroidery and Surface Ornamentation Lab.	0	0	3	1.5	0	0	100	100
			Total				**22.5**				**900**

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6th SEMESTER

Sl. No.	Subject Type	Subject Code	Subject Name	Teaching Hours/Week			Credit	Maximum Marks			
				L	T	P		IA	EA	PA	Total
1	Core Course	UPCFT601	Garment Manufacturing Technology-II	3	0	0	3	30	70	0	100
2	Core Course	UPCFT602	Fabric Structure and Design Analysis	3	0	0	3	30	70	0	100
3	Programme Elective-II	UPEFT601/ UPEFT602	Apparel Production Planning, Controlling and Scheduling / Sustainable Apparel Production/ Logistics and Supply Chain Management in Apparel Industry.	3	0	0	3	30	70	0	100
4	Programme Elective-III	UPEFT603/ UPEFT604	Fashion Photography and Visual Merchandising/ Fashion Forecasting Techniques/ Fashion Styling and Promotion	3	0	0	3	30	70	0	100
5	Open Elective-II			3	0	0	3	30	70	0	100
6	Lab Course	ULCFT601	Garment Manufacturing Technology-II Lab.	0	0	3	1.5	0	0	100	100
7	Lab Course	ULCFT602	Fabric Structure and Design Analysis Lab.	0	0	3	1.5	0	0	100	100
8	Lab Course	ULCFT603	Fashion CADD Lab.	0	0	4	2	0	0	100	100
			Total				**20**				**800**
9	**Summer Internship programme (4 to 8 weeks) is mandatory as per AICTE rule**										

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7th SEMESTER

Sl. No.	Subject Type	Subject Code	Subject Name	Teaching Hours/Week			Credit	Maximum Marks			
				L	T	P		IA	EA	PA	Total
1	Programme Elective-IV	UPEFT701/ UPEFT702	Home Furnishing and Interior Design/ Brand Design and Management	3	0	0	3	30	70	0	100
2	Programme Elective-V	UPEFT703/ UPEFT704	Functional and Smart Apparels/ Technical Textiles	3	0	0	3	30	70	0	100
3	Open Elective-III			3	0	0	3	30	70	0	100
4	Open Elective-IV			3	0	0	3	30	70	0	100
5	Humanities Science Course	UHSMH701	Entrepreneurship Development	3	0	0	3	30	70	0	100
6	Project Course	UPRFT701	Project Stage-1	0	0	6	3	0	0	100	100
7	Seminar	USEFT702	Internship Seminar	0	0	2	1	0	0	100	100
			Total				**19**				**700**

8th SEMESTER

Sl. No.	Subject Type	Subject Code	Subject Name	Teaching Hours/Week			Credit	Maximum Marks			
				L	T	P		IA	EA	PA	Total
1	Programme Elective-VI	UPEFT801/ UPEFT802	Apparel Merchandising and Retailing/ Costing and Financial Management in Apparel Industry/ Import and Export Management	3	0	0	3	30	70	0	100
2	Open Elective-V			3	0	0	3	30	70	0	100
3	Open Elective-VI			3	0	0	3	30	70	0	100
4	Project Course	UPRFT801	Project Stage-2	0	0	14	7	0	0	100	100
5	Core Course	USEFT802	Comprehensive Viva-Voice	0	0	2	1	0	0	100	100
			Total				**17**				**500**

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Semester Wise Credits Break Up								
Subject Type **Semester**	**Professional Core**	**Basic Science**	**Engineering Science**	**Humanities**	**Program Elective**	**Open Elective**	**Project /Seminar**	**Total**
1st		9.5	8					**17.5**
2nd		9.5	8	3				**20.5**
3rd	13	4	3	3				**23**
4th	14.5		3	3				**20.5**
5th	16.5				3	3		**22.5**
6th	11				6	3		**20**
7th				3	6	6	4	**19**
8th					3	6	8	**17**
Total	**55**	**23**	**22**	**12**	**18**	**18**	**12**	**160**

Suggested Open Electives for Other Branches

1. Fundamental Techniques of Apparel Design (UOEFT501)
2. Visual Art and Illustration Techniques (UOEFT601)
3. Fashion Photography (UOEFT701)
4. Fashion Business and Forecasting (UOEFT702)
5. Visual Merchandising (UOEFT801)
6. Smart and Functional Apparel (UOEFT802)

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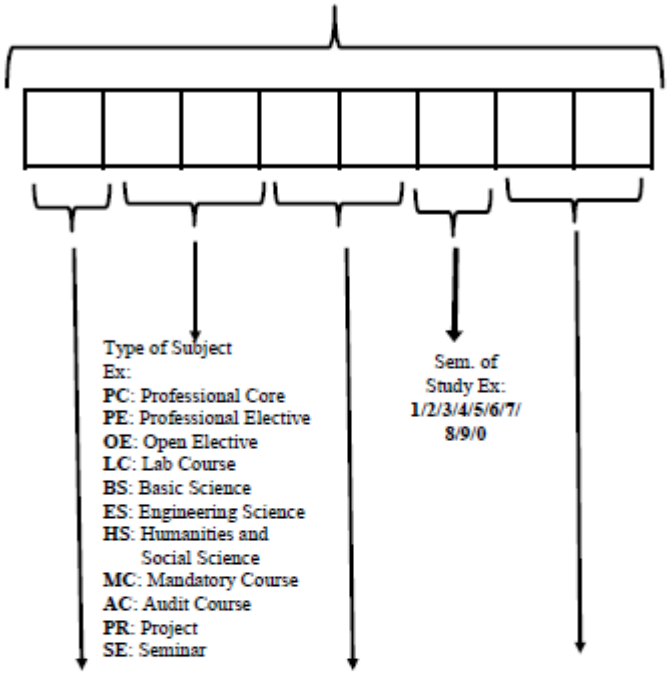
SUBJECT CODE FORMATION



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FASHION TECHNOLOGY COURSE STRUCTURE
B. Tech. (AUTONOMOUS)
Duration: 4 years (Eight Semesters)

Detailed Syllabus (3rd Semester)

SUBJECT NAME: **FIBRE SCIENCE (3)** CODE: **UPCFT301**

Course Outcomes:

After successful completion of this course, the students will be able to develop knowledge and skills of :

- Study of different polymers used for textiles.
- To know about different natural fibers with physical and chemical properties.
- To know the manufacturing techniques of different man-made fibers.
- To know about the high-tech fibers used in textile/ apparel industry.

Module: I

Fundamental Concepts (10Hrs)

Introduction to polymers, Classification of polymers, Different polymerization techniques, with special reference to textile& clothing material, molecular weight and degree of polymerization, polydispersity and molecular weight, size of polymer, properties of fiber forming polymers, Concept of thermoplastic and thermoset material. Concept of rubbery state and rubber elasticity. Transition from glassy to rubbery state. Melting of polymers.
Concept of fiber and Classification of fibres. Essential and Desirable properties of a textile grade fibre .
Identification of Textile fibers by Physical and Chemical methods.

Module-II

Natural Fiber (10Hrs)

Sources of Natural fiber, like vegetable, protein and minerals, Brief idea on extraction of natural fibers from their sources like cotton, jute, flax, hemp, wool, silk etc. Physical and chemical structure of different natural fibers like cotton, jute, flax, hemp, wool, silk etc. Physical and chemical properties of natural fibers, cotton, jute, flax, hemp, wool, silk etc. Application of the fibers like cotton wool, silk, jute etc. Brief idea on other natural fibers like banana, ramie, pineapple, bamboo etc.

Module-III

Man-Made Fiber (10Hrs)

Basic production systems of man-made fiber, brief idea on Melt, Wet and Dry Spinning. Out line of the manufacturing of regenerated fibers like viscose rayon , Cupramonium rayon, acetate rayon soya milk fibers. Introduction to synthetic fibres, Out line of the manufacturing process of filament and Staple fiber with special reference to polyester, polyamide, polypropylene and acrylic fiber.
Brief idea on Post spinning processes like, Drawing, heat setting and texturising of synthetic fibers.
Properties and applications of Glass, carbon, aramid, tencel, modal, polyurethane, micro and nano fibers.

Learning Resources:

1. Manufactured Fiber Technology, by Kothari and Gupta.
2. Textile Fibre- V.A. Shenai
3. Fibre Science and Technology by S.P.Mishra.
5. Textbook of Polymer Science by F.W. Billmeyer.
6. Production of Mand-made Fibres – A.Vaidya

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SUBJECT NAME: **CONCEPT OF FASHION (3)** CODE: **UPCFT302**

Course Outcomes:

After successful completion of this course, the students will be able to develop knowledge and skills of :

- Express knowledge & use of appropriate fashion terminology.
- Express knowledge of global fashion capitals.
- Understanding of difference between High fashion, Mass fashion & custom-made clothing.
- Express their knowledge on industrial revolution & its impact on fashion.

Module-I

Introduction: (10Hrs)

Origin of clothing, Theories of clothing, Origin of fashion, Costumes of ancient civilization, Roman, French Egyptian; Concept of fashion, Fashion language, Nature of fashion. Elements of fashion, Classification of Fashion, Principles of Fashion, Fashion Terminology: Accessories, Apparel, Antique, Boutique, Designer, Knock off, style, design, taste, classic, fad, Fashion Trends. Component of fashion: Silhouette, Texture, Details.

Module-II

Movement of Fashion: (10Hrs)

Fashion Cycle, Stages of Fashion Cycle, Factors influencing Fashion, Environmental factor Demographic & Psychographics, Economic factor, Sociological factor, Psychological factor, Fashion: Theories of Fashion adoption, Fashion Acceptance, Fashion Leader, Fashion Role Model, Fashion follower, Fashion Victims, Fashion Forecasting, Sources of Inspiration: Newspaper, Magazines, Museums, Historical & Ethnic, Fashion Adoption Movement of fashion, Factors influencing fashion movement (accelerating and retarding factors), Fashion Prediction. Fashion Advertisement.

Module-III

Fashion Design (10Hrs)

Introduction, Definition, Role of Fashion Designer, Fashion Capital: New York, Paris, Milan, London, Tokyo, Appreciation of Western Fashion, Study of Leading Fashion Designer- Indian, Italian, American, French and UK.

Design details and their types –Neck lines, collars, sleeves, waist lines, cuffs, skirts, trousers, yokes, waist lines, pockets, pleats, tucks, frills etc; Innovative Fashion Details.

Learning Resources:

1. History of Fashion by Manmeets Sodhia
2. Dress Designing by Manmeets Sodhia
3. Design Studies by Manmeets Sodhia
4. Inside Fashion Design -Kitty G.Dikerson
5. Inside Fashion Business -Kitty G. Dikerson
6. Elements of color & design –Sumathi G.J.

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SUBJECT NAME: **CONCEPTS OF FASHION (PRACTICAL)** CODE: **ULCFT301**

1. To explore designing & develop different designing for fashion.
2. Different themes picked from various sources: magazines, books, films, nature, Surroundings, handicrafts, paintings, etc.
3. Presenting using different presentation: Illusion Effects: Vertical Lines, Horizontal Lines, Diagonal Lines, Thick & Thin Lines, Spiral lines.
4. Showing Fullness in Garment: Rendering Lace, different illusion of Drapes, Folds, Gathers, and Pleats.
5. Illustration of Textures: Soft Fabrics, denim, Jersey, Rib Knit, Chiffon, Satin, Transparent Fabric
6. Different Medium & Presentation Skills should be used like Mood Board
7. Presentation Skills: Collage, Collage on Dress and Collage on Background, Theme Board: Story Board, Swatch Board.
8. Range planning: Planning a Collection, Choosing a Theme- Inspiration, Design Research, Fashion Designing Presentation Board, Preparing Design Development Sheets.
9. Illustrate different types of necklines, collars & sleeves.
10. Illustrate different designs of frills, gathers. pockets, tucks & pleats.

Subject Name: **YARN MANUFACTURING (4)** Code: **UPCFT303**

Course Outcomes:

After successful completion of this course, the students will be able to develop knowledge and skills of :

- Concepts, process parameters involved in short staple spinning**.**
- Production process of long staple fibers like jute, silk etc.
- Steps involved in new spinning systems.
- Concepts of post spinning operations.
- Different types of yarn and their characteristics.

Module-I

Concepts of Short Staple Spinning: (12Hrs)

Definition and classification of yarn, Yarn numbering system, Process flow chart of short staple spinning system. Brief over view on Ginning, Opening & cleaning, blending, blow room, carding, drawing, combing, roving, ring spinning. Study of principles, objectives, functions and process parameters of different machineries involved in ginning, blow room, carding, drawing, roving and ring frame.

Module-II

Modern Spinning Methods : (12Hrs)

Principle ,working and process parameters of, Rotor spinning, Air jet spinning, Friction spinning. Comparison of yarn properties produced in the above processes. Principle ,working and process parameters of spinning system for multi fiber spinning and their blends such as woollen , worsted, spun silk , linen and jute spinning system.

Module-III

Post spinning Operation: (12Hrs)

Principle, working and Sequence of process – Doubling, reeling, Two- For- One Twister, Tow to Top conversion. Concept of balanced twist in doubled yarn, direction of twist in doubled yarn and its relation to single yarn. Study of different types of yarn: (ply, core spun, sewing thread, Slub,and melange yarn).

Module-IV

Sewing Threads and Fancy yarn: (04Hrs)

Manufacturing processes, properties and applications.

Learning Resources:

1. Oxtoby E, –Spun Yarn Technology –, Butterworth, London, 1987.
2. Cotton Spinning, Textile Association of India, Ahmedabad.
3. Klein W, –The Technology of Short-staple Spinning –, The Textile Institute, Manchester, 1998.
4. Klein W, –A Practical Guide to Combing, Drawing and Roving Frame –, The Textile Institute, Manchester, 1999.
5. Manual of Cortton Spinning (Vol-IV) The Textile Institute, Manchoster 1968.
6. Woolen yarn manufacture, RTD Richards & A.B. Skys.

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Mathematics-III (3-1-0)

Prerequisites:

1. Mathematics-I
2. Mathematics-II

Course Outcomes

On successful completion of this course, the students will be able to:

1. Have a fundamental knowledge of the concepts of probability theory.
2. Do correlation and regression and fitting of different types of curves.
3. Apply sampling theory and theory of estimation in various engineering problems and do various tests of hypothesis and significance.
4. Use calculators and tables to perform simple statistical analyses for small samples and use popular statistics packages, such as SAS, SPSS, S-Plus, R or MATLAB to perform simple and sophisticated analyses for large samples.

Module 1: (10 Hours)

Probability: Introduction, Probability of an event, additive rule & multiplication rule, conditional probability, Bayes' rule, random variable, discrete and continuous probability distribution, Joint probability distribution, Mathematical expectations, Variance and Co-variance of random variables, Mean and Co- variance of linear combination of random variables, Chebyshev theorem.

Module 2: (10 Hours)

Discrete Probability Distribution: Binomial & Multinomial, Hyper- geo- metric, Geometric, Poisson distribution.

Continuous Probability Distribution: Uniform, Normal, Exponential Distribution, Weibull's Distribution, Chi-square Distribution, Sampling Distribution: Sampling Distribution of S2, t Distribution, F Distribution.

Module 3: (10 Hours)

Estimation of parameter: methods of estimation, Estimating the mean of a single sample, Standard error, Prediction interval, Tolerance limits, Estimating the difference between means of two samples, estimating proportion and variance of single sample, Estimating the difference between two proportions and variances of two samples, maximum likelihood estimation.

Module 4: (10 Hours)

Testing of hypothesis: one and two tailed test, test on a single mean when variance is known & variance is unknown. Test on two means, test on single mean and two mean populations. One and two sample test for variance. $\chi 2$ test for goodness of fit and test for independence.

Introduction to linear regression: Simple regression models, method of least squares, Properties of least square estimators, Inferences concerning the regression coefficients, Coefficients of determination and its application.

Statistical quality control (Simple Idea only)

Text Books:

1. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers & Keying Ye," Probability & Statistics for Engineers & Scientists", Eighth Edition, 2007, Pearson Education Inc., New Delhi.
2. Jay L. Devore," Probability and Statistics for Engineering and Sciences", Seventh Edition, Thomson/CENGAGE Learning India Pvt. Ltd.

Reference Books:

1. William Mendenhall, Robert J. Beaver & Barbara M. Beaver," Introduction to Probability and Statistics", 13th Edition, 2009, CENGAGE Learning India Pvt. Ltd., New Delhi.
2. T. Veerarajan," Probability, Statistics and Random Processes", Tata McGraw Hill
3. Ronald Deep," Probability and Statistics", Academic Press

Organizational Behaviour (3-0-0)

Prerequisites:

1. English.

Module 1: (10 Hours)

The study of Organizational Behaviour: Definition, Meaning, Why study OB; Learning - Principles of learning and learning theories; Personality- Meaning, Determinants, Types, Personality and OB; Perception- Perceptual Process, perceptual errors, Importance of perception in organizations; Motivation-Nature and Importance, Theories of motivation (Herzberg, Maslow, McGregor).

Module 2: (10 Hours)

Group level: Groups in Organizations -Nature, Types, Reasons behind forming groups, Determinants, factors contributing to Group Cohesiveness, Group Decision Making- Process, advantages and disadvantages; Team- Effective Team Building; Types of Leadership- Effective Leadership, Styles of leadership, Leadership Theories-Trait Theory and Contingency Theory, Leadership and Followership; Conflict- Healthy Vs Unhealthy conflict, Conflict Resolution Techniques.

Module 3: (10 Hours)

Structural level: Organizational Culture: culture and organizational effective- ness; Organizational Change: Types of change, Reasons to change, Resistance to change and to manage resistance. Introduction to organizational development.

Text Books:

1. Stephens P. Robbins, Organizational Behaviour, PHI.
2. K. Aswatthappa, Organizational Behaviour, HPH.

Reference Books:

1. Kavita Singh, Organizational Behaviour, Pearson.
2. D. K. Bhattacharya, Organizational Behaviour, OUP.
3. Pradeep Khandelwal, Organizational Behaviour, TMH.
4. Keith Davis, Organizational Behaviour, McGraw Hill.
5. Nelson Quick, ORGB, Cengage Learning.

FASHION TECHNOLOGY COURSE STRUCTURE
B. Tech. (AUTONOMOUS)
Duration: 4 years (Eight Semesters)

Detailed Syllabus (4th Semester)

SUBJECT NAME: **FASHION SKETCHING AND ILLUSTRATION (3)** CODE: **UPCFT401**

Course Outcomes:

After successful completion of this course, the students will be able to develop knowledge and skills of :

- Gaining fashion illustration technique.
- Gain knowledge of illustration from different artists.
- Gain coloring techniques-markers, pencil drawing, water colours, paint, computer rendering.
- Development of own individual style.

Module-I

Introduction to Designing: (08Hrs)

Sequences of the Designing process, Drawing, Layout and presentation effects, Fashion magazine. Fashion sketching-origin, importance and creative use.

Module-II

Drawing Skills: (10Hrs)

Pencil shading-values or gradation, pressure on pencil effect, three different ways of get gradation: stocks\ hatching \cross hatching, stippling smudging. Drapery and still life-composition of fabric folds with 2D and 3D blocks: vegetable, fruit, flower and leaf.

Module-III

Illustration & Figure Drawing: (12Hrs)

Basic Block Figure- Female, Normal Figure and Fashion Figure. Fashion Block Figure-Female: 10 ½ " and 12 ½ —: Front, Side, 3/4th, Back. Fleshing of Block Figures-Female: 10 ½ " and 12 ½ —: Front, Side, 3/4th, Back, Different Hair Styles and make-up skin tone, hair accessories; Face, Hand, Feet, Angle and Arm Analyses in all poses.

Movement Figure: Balance movement- bent, twisted and stick figure; Movement Points and Axis; Fashion Figure Poses: Block & Flesh Poses & Attitudes, Movement of Figure in all poses.

Learning Resources:

1. Fashion Illustration by Manmeets Sodhia
2. Inside Fashion Design -Kitty G.Dikerson
3. Elements of Fashion & Apparel Design by Sumathi,G.J.
4. Design Studies by Manmeets Sodhia Publication by Kalyani Publisher
5. Fashion Design Drawing by Caroline Tatham Thames & Hudson

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SUBJECT NAME: **FASHION SKETCHING AND ILLUSTRATION (PRACTICAL)** CODE: **ULCFT401**

1. To learn & practice free-hand sketching techniques.
2. To learn medium & techniques for illustration three different ways of gradation: stocks, hatching, cross hatching, stippling & smudging.
3. Three different ways of rendering with pencil shading, pencil / steadler color, wax, crayons, water color & micro tip pen.
4. Fashion figure drawing with the help of blocks.
5. Fleshing of block figures in 10 ½ " and 12 ½.
6. Sketching of different fashion body figures.
7. Sketch Fashion figure with pencil in different postures.
8. Kid‘s fashion: illustration of different types of kids wear.
9. Female: Casual & formal wear illustration.
10. Adult fashion: Illustration of wedding wear, party wear, seasonal wear, sports wear, etc.

SUBJECT NAME: **FASHION DESIGN AND COLOR THEORY(3)** CODE: **UPCFT402**

Course Outcomes:
After successful completion of this course, the students will be able to develop knowledge and skills of :

- Idea about different design.
- Comparison the different types of lines & their character.
- Identification of the design.
- Understanding of the diminutions of colours.
- Understanding of different textile designs

Module-I

Origin and Elements of Fashion: (10Hrs)

Fashion language, Elements of fashion, Terminology of fashion. Fashion trends, 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; Study of different types of motifs: - Natural, Decorative , Geometric and Abstract Motif.

Module-II

Concepts of Colour Theory: (12Hrs)

Definition of colour theories, Light Theory of colour, Chromatic Circle, Pigment Theory of Colour, Colour Wheel, Colour schemes- triad, mono chromatic, achromatic, polychromatic, analogous, Complementary Colour schemes . Attributes of Primary and Secondary Colours. Psychological effect of Colour; warm & cool colour. Rainbow colour Colour Modification and Colour Harmony, Modification of colour as a formation of tints, shades & colour grey; High, Low and Mid Key. Change in Hue, value, Neutralized colour. Achromatic, Monochromatic, Analogues, Complementary and Polychromatic Harmony.

Module-III

Composing Textile Design :(08Hrs)

All Over Repeating Design, Half Drop, Diamond, Ogee base, Waved Line, Rectangular Drop Reverse, Sateen. Application of Colour to woven and printed textiles. Factors influencing the Appearance and Ornamentation of Fabrics with reference to raw-material, weave and finish.

Learning Resources:

1. Inside Fashion Design, Sharon Lee Tats
2. Pattarn Design, Lewis F.day
3. Colour Harmony, Bride N. Whelan, Rockport Publishers.
4. The Costumes and Textiles of India, JamilaBrijBhusan
5. Soamn, Jullian, _Professional Fashion illustration‘ B.T. Batslord, London 1995
6. Drake, Nicholas, _Fashion illustration today‘ Thamesis Hudson. London Publication

SUBJECT NAME: **FASHION DESIGN AND COLOR THEORY (PRACTICAL)** CODE: **ULCFT402**

1. To develop some design using basic concept of line, shape and texture through gradation, repetition, proportion and emphasis.
2. To develop design using different type of motifs (Natural Motif, Decorative Motif, Geometric Motif, Abstract Motif).
3. To produce floral, geometrical abstract and boarder design. Enlargement and deduction of design.
4. To develop Colour mixtures according to pigment theory of colour and show arrangement of the primary, secondary and intermediate Colour.
5. To develop Colour mixture according to light theory of Colour with primary, secondary and intermediate Colour.
6. To develop Colour modification using change in hue, change in value (tints and shades) and coloured grey.
7. To produce monochromatic contrast and to produce polychromatic contrast.
8. To study composition of design / motif using the followings:-
   All over unit repeat, half drop, diamond base, ogee base, sateen and wave line etc.
9. To produce at least five sketches by using different colour shades with own imagination.
10. Creation and manipulation of Colour using computers.

FASHION TECHNOLOGY COURSE STRUCTURE
B. Tech. (AUTONOMOUS)
Duration: 4 years (Eight Semesters)

SUBJECT NAME: **FABRIC MANUFACTURING (4)** CODE: **UPCFT403**

Course Outcomes:
After successful completion of this course, the students will **be able to develop knowledge and skills of:**

- Woven fabric manufacturing preparatory.
- Woven fabric manufacturing machines
- Different types of woven fabric manufacturing techniques
- Idea on knitting and nonwoven fabric manufacturing.

Module: I
Weaving Preparatory Processes: (10Hrs)
Classification of fabrics, Introduction to various fabric manufacturing methods; conversion of yarn into fabric with flow charts. Introduction to warp and weft preparatory processes. objective and principle of winding, pirn winding, warping, direct and sectional warping. Recent developments in winding and warping. Concept of knotter and splicer. Objectives of sizing, various sizing ingredients, methods of sizing, drawing in and beam gaiting.
Module: II
Weaving: (10Hrs)
Basic concepts of looms, types of Looms, passage of a material through plain power loom, Primary, secondary and auxiliary motions of a power loom. Fancy Fabric Formation: Classifications and working principle of dobby, types of Dobby, Classifications and working principle of jacquard, Parts of Jacquard and jacquard loom. Electronic dobby and jacquards;
Module :III
Advanced Weaving :(10Hrs)
Brief idea about shuttleless looms like Projectile, Rapier, Air Jet and Water Jet looms. Fabric defects and value loss, classification, their causes and remedies; Basic Concept of 3D Fabrics.
Module :IV
Knitting, Braiding, Narrow fabrics and Nonwoven (10Hrs)
General classification of Knitting Machine - Flat & Circular. Knit, Tuck & Float Stitches & their uses. Knitting Needles – Latch, beard & compound needles. Weft knitted structures - Blister jacquard, plush, pile, velour and fleecy fabrics. Directionally oriented warp knitted structures. Classification of braided structure, production techniques, properties and applications. Brief idea on manufacture of narrow width products; tapes, ribbon, elastic, laces, woven labels. Basic concepts of non-woven fabrics, Classification, production, properties and applications of nonwoven fabrics.

Learning Resources:

1. P. K. Sriramalu, D. B. Ajgaonkar and M. K. Talukdar, Weaving Machines – Mechanisms, Management Mahajan publishers, Ahmedabad 1998.
2. N N Banerjee, –Weaving Mechanism " , Textile House, Berhampore, 1993
3. Woven Fabric Production I, & II NCUTE Publication, IIT, New Delhi, 2002.
4. P. Marks and A. T. C. Robinson Principles of Weaving, The Textile Institute, 1989.
5. Terry Blackenbury,‖ Knitted Clothing Technology‖, Blackwell Science, 1996.
6. David Spencer, –Knitting Technology‖, Pergamon Press, Oxford 2001.

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Engineering Economics (3-0-0)

Prerequisites:

1. Mathematics.
2. Basic Economics.

Module 1: (10 Hours)

Engineering Economics: Nature, Scope, Basic problems of an economy, Micro Economics and Macro Economics.

Demand: Meaning of demand, Demand function, Law of Demand and its exceptions, Determinants of demand, Demand Estimation and Forecasting, Elasticity of demand & its measurement (Simple numerical problems to be solved), Supply-Meaning of supply, Law of supply and its exception, Determinants of supply, Elasticity of supply, Determination of market equilibrium (Simple numerical problems to be solved).

Production: Production function, Laws of returns: Law of variable proportion, Law of returns to scale.

Module 2: (10 Hours)

Cost and revenue concepts, Basic understanding of different market structures, Determination of equilibrium price under perfect competition (Simple numerical problems to be solved), Break Even Analysis-linear approach (Simple numerical problems to be solved).

Banking: Commercial bank, Functions of commercial bank, Central bank, Functions of Central Bank.

Inflation: Meaning of inflation, types, causes, measures to control inflation.

National Income: Definition, Concepts of national income, Method of measuring national income.

Module 3: (10 Hours)

Time value of money: Interest - Simple and compound, nominal and effective rate of interest, Cash flow diagrams, Principles of economic equivalence.

Evaluation of engineering projects: Present worth method, Future worth method, Annual worth method, Internal rate of return method, Cost benefit analysis for public projects.

Depreciation: Depreciation of capital assert, causes of depreciation, Methods of calculating depreciation (Straight line method, Declining balance method), After tax comparison of project.

Text Books:

1. Riggs, Bedworth and Randhwa," Engineering Economics", McGraw Hill Education India.
2. Deviga Vengedasalam," Principles of Economics", Oxford University Press.
3. William G. Sullivan, Elin M. Wicks, C. Patric Koelling," Engineering Economy", Pearson.
4. R. Paneer Selvam," Engineering Economics", PHI.
5. S. P. Gupta," Macro Economics", TMH.
6. S. B. Gupta," Monetary Economics", Sultan Chand and Co.

FASHION TECHNOLOGY COURSE STRUCTURE
B. Tech. (AUTONOMOUS)
Duration: 4 years (Eight Semesters)

Detailed Syllabus (5th Semester)

SUBJECT NAME: **GARMENT MANUFACTURING-I (3)** CODE: **UPCFT501**

Course Outcomes:

After successful completion of this course, the students will be able to develop knowledge and skills of :

- The classification of garments and basics of body measurements & their importance.
- Classification of patterns and various construction techniques.
- Acquire knowledge in spreading, marker planning and cutting.
- Describe basic principles of different types of cutting machineries used in apparel production.
- Classification of the different types of stitches.
- Definition and classification of different types of seams and seam finishes.

Module-I

Introduction, Pattern and Marker Making: (10Hrs)

Classification of garments for Men, Women and Children; Fabric Selection: According to Age, Occupation, Religion, Dress style, Occasion, and Figure. Basic body measurements and its importance.

Pattern making- Objectives, Importance of paper pattern, Types of paper patterns, Methods of pattern making- a) Drafting b) Flat pattern c) Draping**.** Pattern layout, According to types of fabrics, Different types of lays, Economy of fabrics in layouts, Cloth layouts. Working with different fabrics. Principle of fitting- ease, line, grain, set, balance. Grading. Tracing and marking terminology-Chalked marking, chalked thread, color coding, pin marking, tailors tacks, thread tracing.

Module II

Spreading, Marker Planning and Cutting: (10Hrs)

Spreading: The requirements of the Spreading process, methods of spreading, the nature of fabric packages. Types of Marker, Marker Planning:Requirement of the marker planning Efficiency of marker plan, methods of marker panning and marker use. The objectives of cutting, Requirements of cutting. Cutting room layout and Organization. Tools & equipment for cutting: Band knife, Round Knife click press, electrical notcher, Straight knife, Circular knife, Cutting Board, Cutting Table, Drill, Pattern perforator, Shears, Leaser, UV, Plasma and Jet Cutting.

Bundling- labeling.

Module-III

Stitches and Seams: (10Hrs)

Stitch definition, classification &designation. 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, Lock stitch, Zigzag stitch, over edge machine stitch, Safety stitch, Lettuce edging, shirring stitch. Classification of different types of Seams: Curved seam, enclosed seam, exposed seam, extended seam allowances, intersecting seam, Rolled seam edge, Plain seam, Flat seam, French seam, Edge seam, flat fell seam, Run and fell seam, lapped seam, Bound seam, Corded seam, Slot seam, piped seam, fused 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.

Learning Resources:

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

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SUBJECT NAME: **GARMENT MANUFACTURING TECHNOLOGY-I (PRACTICAL)** CODE: **ULCFT501**

1. Method of taking important body measurements for gents and ladies garments.
2. Developing and creating different patterns by using of 3 techniques.
    a. Drafting, ii) Flat Pattern Technique, iii) Draping
3. Drafting of kids basic bodice block.
4. Preparation of sample of basic stitches (Hand Stitches)
5. Preparation of samples of basic machine stitches.
6. Making of sample of different cut and stitch – Kids
7. Preparation of sample of different types of seam
8. Sewing practice of – superimposed seam, lapped seam.
9. Sewing Practice of bound seam and flat seam.
10. Assembling of various garment components using appropriate seams.

SUBJECT NAME: **TESTING OF TEXTILE MATERIALS (3)** CODE: **UPCFT502**

Course Outcomes:
After successful completion of this course, the students will be able to develop knowledge and skills of :

- Testing parameters of textile products.
- Testing methods of different yarn.
- Testing methods of different fabrics.
- Testing methods of apparels.

Module-I
Introduction: (05Hrs)
Concept of Sampling, population, classification of data for fiber, yarn, fabric and garment testing, Measures of dispersion –mean deviation ,standard deviation , C.V.%. Relative humidity and standard condition for testing. Moisture content and moisture regains of different fibers.

Module –II

Yarn and Fabric Testing: (15Hrs)

State the twist measurement in single and ply yarns, count of single and double yarn, , measurement of single yarn strength and Lea strength, Brief idea on CRT, CRL & CRE, Concept of CSP, concept of yarn evenness, index of irregularity, Explain methods of assessing yarn irregularity by Visual cutting and weighting , photoelectric and capacitance methods, Define Yarn Hairiness & Explain ASTM Yarn grading. Classimat yarn faults.

Fabric Testing: Measurement of fabric physical properties like, length, width, thickness, Area density (GSM),Warp and Weft crimp, Cover factor calculations. Measurement of Comfort related fabric properties; air permeability, water vapour permeability, thermal conductivity, moisture transport; wetting, wicking, water absorption, water repellency, waterproof, hydro static head test. Measurement of handle and mechanical properties like: Tear, Tensile, bursting strength, Fabric Abrasion, Pilling, snagging etc.

Module-IV
Apparel Testing: (10Hrs)
Dimensions, Seam strength, Seam slippage, Adhesion between interlining and fabric, shrinkage, zippers, buttons, snap fasteners and other general garment properties Needle Cutting/Yarn severance Color fastness to washing, light, rubbing, water etc. shade difference in one color ,problem related to embroidery fabric. Eco- parameters requirement for garments.

Learning Resources:

1. Saville B P, Physical Testing of Textiles, Woodhead Publishing Ltd, Cambridge, 2002.
2. Booth J E Principles of Textile Testing, CBS Publishers and Distributors, New Delhi, 2008.
3. A Hand Book of Testing ,Sundaram.
4. Physical Testing & Quality Control, K. Slater
5. Irfan Ahmed sheikh, Pocket textile testing & Quality expert, Irfan publisher, 2009.

SUBJECT NAME: **TESTING OF TEXTILE MATERIALS (PRACTICAL)** CODE: **ULCFT502**

1. Determination of Mean length , effective length , percentage of short fibres and percentage of dispersion by using Baer sorter.
2. To determine the count of a yarn by using physical/electronic balance.
3. To measure the Single yarn and Ply yarn twist of the given yarn sample using Twist Tester.
4. To determine the single yarn strength.
5. To Study evenness and imperfection in the given yarn and compare the results with Uster statistics.
6. To Determine of following particulars of the given fabric: (1) Ends/inch (2) Pick/inch (3) Warp Count (4) Weft count (5) Warp and Weft contraction % (6) Grams/Sq. mt. (7) Size pick up (8) Fabric cover.
7. To determine of Tensile Strength of Fabric (Both reveled and un-revelled) by vertical fabric strength tester.
8. To determine of Bursting Strength and abrasion Resistant of Fabric by bursting strength tester and abrasion resistant ester.
9. To determine the drape coefficient of woven and knitted fabric using the drape meter.
10. To determine the seam strength, stitch length, stitch density of garment.

SUBJECT NAME: **EMBROIDERY AND SURFACE ORNAMENTATION (3)** **UPCFT503**

Course Outcomes:
After successful completion of this course, the students will be able to develop knowledge and skills of :

- To learn & identify the use embroidery tools with safety precautions in order to prepare basic sample hand stitches (Temporary & permanent stitch).
- To learns & describe & use different types of tracing method carbon paper, tissue paper, tracing paper, water soluble pen, tracing box (light box), hot pressing and wooden block method.
- Study to decorate garment's part with a suitable Embroidery design.
- Preparation of sample of different states of India like: phulkari of Punjab, kantha of Bengal, kasuti of Karnataka, chikankari of Luckhnow, kashida of Kashmir, chamba of Himachal, kutch of Karnatak.

Module- I
Introduction to Embroidery: **(06Hrs)**
Introduction, Definition & Types of Embroidery, General Embroidery Kits, Tools & Equipments for Embroidery, Basics Principles of hand embroidery, m/c embroidery, computerized embroidery. Hand Stitches: Chain, Back, Blanket, Button Hole, Zig Zag, Twisted Chain, Running , Straight, Seeding, Open Work, Cut Work, Drawn Thread Work, Cross Stitch, Count Thread Work. Outline Stitch, Border Stitch, Cross Stitch, Composite Band Stitches, Cut Work, Drawn Thread Work, Solid Filling Stitch, Insertion Stitches, Isolated Stitches, Edging Stitches, Pulled Thread Work

Module-II
Accessories & Decoration: **(08Hrs)**
Definition, Need & Types of Fashion Accessories. Foot Wear, Hosiery, Hand Bag, Belts, Gloves, Watches & Jewellery- Ear Rings, Nose Rings, Bangles, Necklace, Foot Rings, Payel, Anklets, Bracelets. Concept of Construction Accessories; Decoration: Introduction, Tools & Equipments used in Decoration. Types of Decoration- Beads, Mirror, Chumiki, Ribbon, Sequins. Use of Beads & Sequins.

Module-III
Traditional Embroidery of India: **(16Hrs)**
Traditional Embroidery of Jammu & Kashmir: Kasida. Traditional Embroidery of West Bengal: Kanthas. Traditional Embroidery of Himachal Pradesh: Chamba Rumal. Traditional Embroidery of Uttar Pradesh: Chickenkari. Traditional Embroidery of Uttar Pradesh: Zardozi. Traditional Embroidery of Punjab: Phulkari. Traditional Embroidery of Gujarat: Kutch.
Surface Ornamentation: Introduction of Surface Ornamentation. Tools & Equipments used in Surface Ornamentation. Types of Surface Ornamentation. Zardozi Work :Overview & Recent trends of Zardozi Work, Raw Materials used in Zardozi: Threads, Beads, Chancy, Gold Sally, White Sally, Gold Zardozi, Silver Zardozi, Mirror, Sequins. Application of Zardozi in different Garment, General Precautions to take in Zardozi work. Gold and Silver thread work – Materials and Methods used, Mirror Work, Raised Work, Appliqué, Quilting, Patch Work.

Learning Resources:
1. Embroidery Designs by Nirmala C Mistry ,Navneet Publisher
2. Encyclopedia of embroidery by Reader digest
3. Traditional Indian textiles-John Gillow
4. History of Fashion by Manmeets Sodhia Kalyani Publisher
5. Garment Construction by Manmeets Sodhia Kalyani Publisher

SUBJECT NAME: **EMBROIDERY AND SURFACE ORNAMENTATION (PRACTICAL)** CODE: **ULCFT503**

1. Basic hand embroidery stitches.
2. Samples of machine embroidery stitches.
3. One embroidery from each state of study -chikan, kantha, mirror, appliqué, chamba, mochi, phulkari.
4. Application of hand embroidery stitches on home furnishing.
5. Making of ornamentations like fringes, tassels, pompons, sequins and beads.
6. Application of any embroidery/surface ornamentation on a men‘swear.
7. Application of different embroidery/surface ornamentation on kids‘ wears.
8. Application of different embroidery /surface ornamentation on women‘s wear.
9. Block printing, Batik, Tie & dye techniques.
10. Smocking, Pleats, Patch & Cutwork.

SUBJECT NAME: **INDIAN TRADITIONAL TEXTILE DESIGN (3)** CODE: **UPCFT504**

Course Outcomes:

After successful completion of this course, the students will be able to develop knowledge and skills of :

- Ancient costumes used world wide
- Traditional costumes of various states of India.
- Surface designs induced in fabrics.
- Differences between traditional and modern textile designs

Module-I

History of Costumes: (08Hrs)

Greek and Persian influence on fashion. French Costumes: French Costumes during renaissance 1400-1600. English costumes :English Costume during Middle Ages. American costumes: American costumes from 18th to 20th centuries.

Module-II

Traditional Costumes: (12Hrs)

African and European traditional costumes, colour combination, designs, motifs and accessories. Traditional costumes of Asian countries – Japan, China, Srilanka, Indonesian, Afghanistan and Thailand. Indian Costumes: The earliest times to the beginning of the historical period: Indus valley Civilization Costumes, Indo Aryans & Vedic Age, Mauryan & the Sunga Period, Satavahana Period, Kushan Period, Gupta Period, Mughal Period. Traditional textile and Their relation with, Religion, Culture, Climatic & Socio economic conditions.

Module-III

Traditional Textiles: (10Hrs)

Traditional Textiles with the special reference of materials, colors, motifs and production processes – Ikat, Patola, Kalamkari, Chanderi, Kota, Brocades, Bandhani, Madhubani and Pattachitra, Bharat, Pathani (MH); Block Printed Textiles; Traditional Textiles with special reference to fabric, embroidery, threads, and stitches, - Chickankari, Phulkari, Kanthas, Kani Jamawar (Kasmir), Himroo, Kasuti, Applique Work – Orissa, Gujarat, Bihar and Rajasthan

Learning Resources:

1. ‖Historic Costumes‖ - Katherine Morris Cester, Prentice Hall 2000.
2. –Traditional Indian Textiles|- Fillow J and Bernard N Thomas and Hudson, Prentice Hall, India,
3.–Historical Fashion in detail the 17th and 18th Centuries| -Hart A North S V and A Museum, , McMillan, India, 1998.
4.–Traditional Textile Designs of India| - B.K. Behera, IIT, Delhi.
5. –The costumes and Textiles of India| - Jamila Brij Bhusan, Prentice Hall 2000.

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SUBJECT NAME: **GARMENT PROCESSING AND FINISHING (3)** **UPEFT501**

Course Outcomes:

After successful completion of this course, the students will be able to develop knowledge and skills of :

- Textile pre coloration process.
- Different methods of coloring the textile goods.
- Different finishing application to textile goods.
- Different coloring and finishing of apparels.

Module: I

Pre Coloration Process: (8Hrs)

Pre-cleaning, Mending, Stamping, stitching , Shearing and Cropping, Objective, mechanisms, process parameters involved in singeing, desizing, scouring, bleaching etc. assessment of desizing, scouring and bleaching efficiency. Machineries used in the pre coloration process. Brief idea on hot and cold mercerization, optical brighteners.

Module-II

Textile Coloration Techniques: (10Hrs)

Different dyes, their classification and application, Machineries used for loose fibre dyeing, yarn, hank and fabric dyeing. Brief idea on different dyeing machineries like, Winch, Jet, Beam, Jigger, J-Box system. Principles of application of direct, vat, sulphur dyes on cellulosic fibers, Dyeing of protein materials: acid, metal complex, chrome and basic dyes. Dyeing of synthetic materials: Nylon, Polyester and Acrylic. Printing: Styles of printing– Direct, resist, discharge and transfer, Printing methods - Block, screen, Transfer and Digital printing, after treatments for dyed and printed goods ,washing, steaming and drying.

Module-III

Fabric and Garment Finishing: (12Hrs)

Finishes- definition, types- Temporary and permanent Finishes, Basic/routine—Tentering, Decatising, sanforising, calendaring, Functional/ special-waterproof and water repellent, Wrinkle free, antimicrobial, Flame retardant and other special finishes. Classify drying machines, Discuss Working principle of Hydroextractor , multi cylinder drying, IR/ RF dryer.

Apparel Finishing: Flock printing, foam printing, transfer printing, wet transfer, film release, sublimation transfer printing. Preparations of logo and motifs for fixing on garments. , wash and wear, acid wash, stone wash, bio-stoning, crinkled, denim and blast finishing, bio polishing and controlling factors. Brushing of garments. washing, , pressing. Identification of stains, characteristics and history, selection of spotting chemicals, factors for spotting, dry cleaning. Basic concept of pressing, folding, bar tacking, stickering, packaging etc.

Learning Resources:

1. Textile Chemistry, Part-I & II : R.H. Peters, Elsevier .
2. Dyeing & Chemical Technology of Textile Fibres : E. R. Trotman.
3. Bhagwat R.S ―Handbook of Textile Processing, Colour Publication.
4. Shenai, V.A. ―Technology of Bleaching and Mercerizing - Vol. III, Sevak Publications.
5. Fundamental and practices in colouration of textiles, J N Chakravorty, Woodhead Publishing India Pvt Ltd, 2008
6. Shenai V A, ―Technology of Printing‖, Sevak Publications, Mumbai, 1990
7. JT Marsh, An Introduction to Textile Finishing, Chapman and Hall, 2nd Ed, London, 1966
8. Whittall NS., "Laundering and dry cleaning", vol.8, Textile Progress

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SUBJECT NAME: **CLOTHING SCIENCE AND TECHNOLOGY (3)** **UPEFT502**

Course Outcomes:

After successful completion of this course, the students will be able to develop knowledge and skills of :

- To enable the students to understand specific characteristics of human clothing.
- To gain knowledge about the fabric handle and aesthetic properties of fabric required for human clothing.
- To understand the comfort characteristics of fabric for clothing purposes.
- To understand the physiological and field testing of clothing.

Module-I

Introduction : (08Hrs)

Concept of selection of fabrics for clothing purpose – Types of fabric, required for apparel use for different age group, occasions, purpose – Fabric properties and performance for apparel use. Serviceability of Fabrics: Abrasion resistance - flat abrasion, flex abrasion, edge abrasion, Pilling - mechanism of pilling formation, anti-pilling techniques, Snagging, Strength - Tearing strength - Tensile strength - Bursting strength , seam strength and seam slippage.

Module-II

Aesthetic properties: (10Hrs)

Drape, Crease and Wrinkle recovery - Lustre. Yarn unevenness: neps, thick place, thin place, periodic fault, Scroopiness, Colour-Colour fastness: to light, washing, perspiration, rubbing, dry cleaning. Dimensional Stability of Fabrics**:** Hygral expansion, Relaxation shrinkage, Swelling, shrinkage, Felting shrinkage. Mechanism of fabric shrinkage- Relationship between Hygral Expansion, Relaxation shrinkage and extensibility - Knitting Process Parameters and fabric stability. Methods of measuring dimensional stability to dry cleaning and dry heat. Fabric Hand : smoothness, fullness and stiffness, subjective hand judgment, objective, evaluation of fabric hand and its applications.

Module-III

Clothing Comfort: (12Hrs)

Definition of comfort - Human clothing system - Physical, Physiological, and psychological aspects of comfort – Tactile and pressure sensation aspects. Applications, of clothing comfort research. Thermal Comfort : Introduction. Thermal transfer processes – Dry heat transfer and, Rapid heat transfer. Function of Textiles in enhancing thermal comfort. Comparison of thermal comfort properties for different textile structures. Functional Properties **:** Elasticity: elastic recovery, residual strain; Thermal insulation ; Water repellence, water resistance and water proof; Wicking: vertical and horizontal,transportation of liquid; Water absorbency; UV protection; Soil release Safety : Toxicity - residual dye stuff and other finishing agent ; Flammability

Learning Resources:

1. Kothari, V K, ―Testing and Quality Management ―, CBS Book Publishers, New Delhi, 2000.
2. Li. Y, ―The Science of Clothing Comfort‖, Textile Progress, Volume: 31, No. 1/2, Textile Institute, ISBN: 1870372247, 2001.
3. Saville B P, ―Physical Testing of Textiles,‖ The Textile Institute, Woodhead publication limited, Cambridge, ISBN: 1855733676, 1999.
4. Billie J Collier and Helen H Epps,‖ Textile Testing and Analysis,‖Prentice- Hall Inc., New Jersey , ISBN 0134882148, 1999.
5. Lyman Fourt & Norman R.S. Hollies, ―Clothing: Comfort & Functions‖, Marcel Dekker, Inc, Newyork, ISBN: 0-8247-1214-5.
6. G.Song, ―Improving Comfort in Clothing‖, Woodhead Publication Ltd, ISBN: 1-84569-539-9.
7. A.Das, R.Alagirusamy, IIT Delhi, ―Science in Clothing Comfort‖, Woodhead Publication Ltd, ISBN: 1-84569-789-8.

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Detailed Syllabus (6th Semester)

SUBJECT NAME: **GARMENT MANUFACTURING TECHNOLOGY-II (3)** **UPCFT601**

Course Outcomes:

After successful completion of this course, the students will be able to develop knowledge and skills of :

- Explain the parts and functions of various sewing machines.
- Acquire knowledge of working principles in advanced and special garment machineries.
- Various Sewing accessories and trims used in garment.
- Different fusing and pressing elements in garment manufacturing with packing styles.
- Fabric selection using different parameters.
- The knowledge of different sewing dynamics.

Module- I

Sewing Machines and Attachments: (10Hrs)

Sewing Machine: Feeding mechanism and Sewing machine beds. Detailed Knowledge on different kind of Stitching machines– Chain, lock, blind, zigzag, buttonhole, multi needle 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. Defects and remedies, Care and maintenance of sewing machines.

Module-II

Sewing Accessories and Trims with Fusing and Pressing: (10Hrs)

Sewing Needles: Type, Characteristic and Use. Sewing Threads**:** Fibre types, Thread composition, Thread Finishes, Thread Properties and Their Relationship with Needles. Trims and use of Other Components-Labels and motif, Wadding, Lace, Braid, Elastic, Hook and Loop Fastening, Zip Fasteners, Buttons, Shoulder Pad, Tuck Button, snap fastener etc.

Lining and Interlining, Need for pressing, Types of pressing, Pressing equipment and methods; Pleating, Classification of pressing. Garment finishing machines. Fusing Technology: Requirement of fusing, method of fusing, fusing process. Packing:different types of packing, packing materials, labels and tags.

Module-III

Selection of Fabric and Sewing Dynamics: (10Hrs)

Face Fabric, Fabric Specifications for various end use applications, Fabric Grading based on Point System, Fabric Selection based on Formability. Concept of Snake Chart (FAST) for Selection of Fabric.

Control of Sewing Thread Tension, Needle Penetration Force: (Different Models), Difference between Sewability and Tailorability, Determination of Sewability: Factors Affecting Sewability; Seam Strength and Seam Efficiency, Seam Slippage, Seam Pucker and Needle Cutting Index (NCI)/Yarn Severance.

Learning Resources:

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

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IA = Internal Assessment , PA = Practical Assessment, EA = End-Semester Assessment

SUBJECT NAME:**GARMENT MANUFACTURING TECHNOLOGY-II (PRACTICAL)** CODE:**ULCFT601**

1. Study of the Sewing machineries, different parts and functions.
2. Study of Feed-of-the-arm machine.
3. Preparation of sample of different types of pockets
4. Preparation of sample of different types of Plackets
5. Preparation of sample of different necklines using facing and piping.
6. Sewing and finishing formal men‘s top & bottom wear.
7. Sewing and finishing basic women‘s top & bottom wear.
8. Sewing and finishing of kid‘s wear.
9. A traditional Indian Garment.
10. A traditional Sambalpuri garment construction.

SUBJECT NAME: **FABRIC STRUCTURE AND DESIGN ANALYSIS (3)** CODE: **UPCFT602**

Course Outcomes:

After successful completion of this course, the students will be able to develop knowledge and skills of :

- To produce the basic designs in the graph paper.
- To produce decorative textile designs.
- To produce complex textile designs.
- To produce innovative designs using CAD software.

Module: I

Basic Weaves: (10Hrs)

Woven design fundamentals; Classification of woven structures, methods of weave representation, Basic elements of a woven design; Design, Drafting plan, Peg plan and Denting. Basic concept of Plain woven structure and derivatives like plain, warp rib, weft rib and matt etc. with end uses, Twill Weaves and its derivatives like balanced and balanced twill, pointed twill ,combined twill, broken twill, Construct Diamond, Construct satin & Sateen with end uses.

Module-II

Compound Weaves: (10Hrs)

Construction of ordinary honey comb, Brighton, Huck-a-Back, Mock leno and their Application.

Construct Bedford cords(Plain & twill faced with wadding effect) & welts design; Describe colour and weave combination, like continuous line, hairline, birds eye ,step pattern. Concept of Pile fabric, Manufacturing of : Terry pile, velvet structure, velveteen , Brief idea on construction for Back and double cloth, gauge and leno weaves and their representation in design paper.

Module-IV

Decorative Weaves: (10Hrs)

Construct Extra warp and extra weft designs with drafting & lifting; and their applications, State different factors affecting Jacquard design, construct jacquard design like Damask, tapestry, tissue & Brocade Designs. Different software for textile woven design with windows platform.

Learning Resources:

1. Groscicki Z J, –Watson Textile Design and Colour|, Woodhead Publishing, New Delhi, 1975.
2. Gokarneshan N., Fabric structure and design, New Age Publishers, New Delhi, 2008
3. Grammar of Textile Design, Nisbeth H, D B Tarapore Wala sons and Co. Bombay, 2010.
4. Elementary Textile Design and Fabric Structure, John Read , Hildreth Press, 2011.
5. The Primary Structures of Fabrics, Irene Emery, Thames & Hudson Ltd., London, 2009

SUBJECT NAME: **FABRIC STRUCTURE AND DESIGN ANALYSIS (PRACTICAL)** CODE: **ULCFT602**

1. Analysis of cloth (plain & it‘s derivatives)
2. Analysis of cloth(Twill, Sateen/Satin, Honey comb, Mock-leno, Huck-A-Back)
3. Analysis of cloth (Terry pile, velvet, Back, Double, leno).
4. Transfer of a design on point paper.
5. Apply Computer aided design.

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Subject Name: **Apparel Production, Planning and Control (3)** Code: **UPEFT601**

Course Outcomes:

After successful completion of this course, the students will be able to develop knowledge and skills of :

- Concept of production and its planning.
- Concept of data management and prototype development.
- Idea on apparel manufacturing techniques.
- Concept about plant layout.
- Idea about scheduling methods.

Module-I

Production planning and control: (08Hrs)

Concept of Production - Definition, Objectives of production control, relationship of production control to the functional areas of a manufacturing organization, Productivity. Pre planning: Pre-production functions, Importance of Preproduction function. Lead Time, Product development - steps from prototype to production sample. Product data management.

Module-II

Plant layout: (12Hrs)

Apparel manufacturing systems: Different Production systems: Progressive bundle system, Unit production system, multiple flow system, modular manufacturing systems, mass customization – their advantages and disadvantages. Guide lines for choosing suitable production system.

Plant Layout – definition, criteria for evaluation, types of production layout. Minimum space requirement, Flow Process Grids and Charts – Flow process grid construction, flow process grids for production control. Cut production analysis: Cut order planning – spreading, marker planning, types of marker, marker utilization, economic cut quantities**,** Planning of sewing room**.**

Module-III

Material management: (10Hrs)

Just in Time Production system (JIT), Optimized Production Technology (OPT), Inventory Modeling – Economic order quantity (EOQ). Control Forms: Functions of cutting order, cutting ticket, bundle control sheet. Principles of Scheduling: scheduling charts – GANTT chart, backlog graph. Scheduling techniques Network representation – CPM and PERT. Plant loading and capacity planning: Determination of machine requirements for a new factory -calculation of labour requirements. Line balancing: determination and allocation of man power and machines for balanced production in existing plant for a given target, application of line balancing techniques – Balance control.

Learning Resources:

1. Garg R.K, and Sharma V., ―Production Planning and Control Management‖, Dhanpat Rai Publishing, 2003.
2. Plant layout & materials handling- Apple J M- Ronald Press
3. Motion and time study- Barnes Ralph- John Wiley & Sons 1999.
4. Jacob Solinger, ―Apparel Production Handbook‖, Reinhold Publications, 1998.
5. Telsang (Martand) ―Industrial Engineering and Production Management‖ S. Chand & Company Limited, 2008
6. Rajesh Bheda ― Managing Productivity of Apparel Industry‖ CBI publishers and distributors, New Delhi 2002.

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Subject Name: **SUSTAINABLE APPAREL PRODUCTION (3)** Code: **UPEFT602**

Course Outcomes:

After successful completion of this course, the students will be able to develop knowledge and skills of :

- Understand the environmental impact of clothing industry.
- Understand importance of designing for sustainability.
- Learn and implement sustainable fashion practices.

Module I

Sustainable Design:(10Hrs)

Ecological Sensitivity and Design Sustainability and Sustainable designs – Introduction to sustainability – Sustainable fashion, Forms of Sustainable Fashion, Sustainable Fashion Cycle, Sustainable Fashion Practice, Sourcing and direct applications – Sustainable interior designs, Sustainable marketing

Module II (12Hrs)

Environmental Ethics of Fashion: (12Hrs)

Environmental issues in Fashion Waste Couture: The Environmental Price of Fashion- Environmental Impact of the clothing industry – Potential environmental and occupational hazards in fashion industry - Legacy of Waste Couture. Fashion, Humanism and Environment - Environmental ethics of fashion Fashion Forward - Eco-fashion – green fashion – natural as well as recycled fibres in cloth industry –concept of trash ion. Fashion Design: Combining Aesthetics with the Environment Philosophic Contentions of aesthetic appreciation – Art and Imagination - human aesthetics - art and knowledge – art and action Historical roots of environmental aesthetics – Cognitive views – Non cognitive views – Aesthetics of human environment and everyday life – Environmental aesthetics and environmentalism.

Module III (08Hrs)

Eco - friendly Fashion Industry: (08Hrs)

Effects Of Technological Growth: Rapid Technological Growth And Depletion Of Resources, Sustainable Development Energy Crisis; Renewable Energy Resources Environmental Degradation And Pollution. Eco-Friendly Technologies. Environmental Regulations.

Learning Resources:

1. Subramanian SenthilkannanMuthu, ‒Handbook of Sustainable Apparel Production|, CRC Press Taylor & Francis Group, 1st Edition 2015
2. Dr Richard S. Blackburn, ‒Sustainable Apparel: Production, Processing And Recycling|, Woodhead Publishing; 1stedition (2015)
3. Kate Fletcher and Lynda Grose, ‒Fashion and Sustainability: Design for Change|, Laurence King; Reprint edition (2012)
4. Joanne Finkelstein, "Chic Theory," Australian Humanities Review (1995).
5. Sustainable Fashion and Textiles: Design Journeys. Kate Fletcher. 2008
6. Dr. David C. Innes, "What Do Your Clothes Say About You?" (1993).

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Subject Name: **FASHION PHOTOGRAPHY AND VISUAL MERCHANDISING (3)** Code: **UPEFT603**

Course Outcomes:
After successful completion of this course, the students will be able to develop knowledge and skills of :

- Entire medium of visual image from technical as well as from an art point of view.
- Understanding of the importance of visualization and observation in fashion photography.
- Utilization of photography as a medium of effective communication.
- Understanding of fashion and visual merchandising.

Module-I

Introduction to Photography: (10Hrs)
History and origin**,** Various parts of still Camera, Use of lens, Exposure , Depth of Field, Use of light and its effect, contrast and its use, Photographing using natural light, Close-up photography, Sensor, Format, Pixel, Quality of image, Resolution, Factors affecting picture quality, Understanding White Balance in Digital Photography , Color Temperature, How does the Light Affect the Color? Compression (lossy and lossless), Storing**,** Composition: Rule of third, golden points, Color Vision, Digital camera and human Eye comparison, Primary and Secondary colour, Mixture of colours, use of colour to create mood, Role of light in quality photography, Use of natural light, Use of artificial light to create natural effect.

Module-II
Fashion Photography: (10Hrs)
Human Photography, Product Photography, Emotion, style, posture, self promotion, visual aesthetics of photography, Role of light in quality photography, Use of natural light, Use of artificial light to create natural effect. Selection of photography, assistants, stylist, make- up artist and hair stylist, selection of the model. Quality of photograph : JPEG, TIFF and RAW,RAW Vs JPEG, Sensitivity, Sensor size, crop factor, Normal lens for various format, pixel type, Bit depth, Byer Arrey, Display, Printing, DPI and PPI, storage device, Digital Camera Interface. Post production: Choosing format size while giving order for printing and selecting printing papers.

Module-III

Visual Merchandising: (10Hrs)
Meaning & definitions, Concept, Principles and functions of VM, VM as an Art or Science, Definitions, Functions, Display basics. Store Personality & Image, Importance of the need to understand the Store Personality and Image in the context of the target market. Cross Merchandising, Impulse buying. Displays, Importance of display, Types of display and display settings. Store Window, Detailed study of display for store windows – closed back, open back, construction, glare, Mannequins Space Planning Fixtures, Props Lighting Mannequins and alternatives to mannequins, Space Planning & Fixtures Types of Props & 3D Forms Systems & In store furniture and lighting. VM Planning Implementation & Control, Calendar Planning, Importance of festivals in the Indian context. Sales Tracking, QA & SOPs, Exhibit and trade show design. Principles for New Store Launch/Existing Stores/Clearance Sales.

Learning Resources:

1. Fashion Photography: A Complete Guide to the Tools and Techniques of the Trade. Author: Bruce Smith. Publisher: Crown Publishing Group. 2008.
2. The New Art of Photographing Nature. Author: ART WOLFE. Publisher: RANDOM HOUSE INDIA. 2013
3. Fashion Buying & Merchandising, Sidney Packard.
4. Fashion Marketing & Merchandising: Student Workbook. Author: Mary Wolfe. Publisher: Goodheart-Wilcox Publisher, 2008.
5. Silent Selling, Judy Bell and Kate Ternus, Blooms Bury, Publication.

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Subject Name: **FASHION STYLING AND PROMOTION (3)** Code: **UPEFT604**

Course Outcomes:

After successful completion of this course, the students will be able to develop knowledge and skills of :

- Different styles of fashion like, personal, corporate etc.
- Promotion and advertisement of fashion business.
- Importance of media in fashion promotion.
- Effective communication media for fashion forecasting and trend analysis.

Module I

Fashion Styling: (10Hrs)

Introduction to fashion styling, disciplines of styling – fashion image construction, garment and prop sourcing, re-modification, recycling and customization. Fashion stylist, Types of fashion stylists – editorial, catalogue, wardrobe, event/live performance, celebrity, commercial, runway, corporate, personal shopping, merchandise styling. Skills required for successful fashion styling, Fashion styling Vs Image consulting.

Module II

Fashion Promotion: (10Hrs)

Introduction to fashion promotion, objectives of promotion, traditional approach to promotion, promotion tools – consumer, trade and business, Fashion advertising, PR, celebrity endorsement and sponsorship, personal selling, visual merchandising and marketing, Concept of fashion forecasting, trend analysis.

Module III

Communication Media: (10Hrs)

Importance of media, media planning, media types and techniques– social media, print media, television, radio, direct mail, outdoor, Internet, Communication design, effectiveness of marketing communications, copy writing, catalogue design, advertising campaigns, editorials, brand image design

Learning Resources:

1. The little dictionary of fashion by Christian Dior
2. Advanced style: Older & Wiser by Ari Seth Cohen
3. Secrets of Stylists by Sasha CharninMorroison
4. What to Wear, Where: The How-to Handbook for any style situation by Hillary Kerr
5. Fashion Marketing by Mike Easey
6. Principles of Marketing by Phillip Kotler and Gary Armstrong

Subject Name: **FASHION CADD (Practical) (2)** Code: **ULCFT603**

Course Outcomes:

After successful completion of this course, the students will be able to develop knowledge and skills of :

- Hardware, Software & basic tools used for development of textile & apparel design through CAD.
- Utilization of graphic package: Corel draw, Adobe photo shop, CAD.
- Colour selection & application through CAD.
- Pattern making using CAD software.

Experiments or Practical to be conducted.

1. Motif generation on computer.
2. Study of Photoshop tools in detail, enhancing images & pixels, types of file formats, edit tools: transform, fill, brush tool, Layers & filters.
3. Learning basic tools of Coral Draw. Working with Text, Lines, Shapes & Objects, Outlines & fills, Applying fill, outlines, special effects, shaping objects.
4. Development of basic weave design & their derivation through CAD.
5. Developing Croqui figures for men, women and children using Photoshop/ Corel Draw/CAD.
6. Design flat sketches Men's wear/ Ladies wear/ kids wear using CAD.
7. Draping of garments on men_s, women_s & children casual, party, night, sports, office/formal wears using Fashion Studio software / Photoshop / Corel Draw.
8. Creating spec sheets, cost sheets for each garment using Fashion Studio software / Photoshop / Corel Draw.
9. Study of principles of pattern making using CAD and preparing
10. Grading of the above pattern.
11. Marker planning for women_s wear like: Top/Skirt/ Men_s Shirt/Trouser/Kurtha.
12. Study of principles of computerized cutting & sewing.

Learning Resources:

1. CAD/CAM by Groover&zimmer
2. Inside Fashion Design -Kitty G.Dikerson
3. Inside Fashion Business -Kitty G. Dikerson
4. Elements of color& design –Sumathi G.J.

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FASHION TECHNOLOGY COURSE STRUCTURE
B. Tech. (AUTONOMOUS)
Duration: 4 years (Eight Semesters)

Detailed Syllabus (7th Semester)

Subject Name: **HOME FURNISHING AND INTERIOR DESIGN (3)** Code: **UPEFT701**

Course Outcomes:

After successful completion of this course, the students will be able to develop knowledge and skills of :

- Different fibers, fabrics used for home textiles.
- Varieties of home decorative items.
- Concepts of interior design in modern life style.
- Selection of fabrics for draperies.

Module-I

Classification of Home Textiles: (12Hrs)

Clothing, home furnishing and technical textiles, Introduction to furnishing fabric according to Classification based on end use & application properties & performance required raw materials used. Bed linen-Different Types of Bed Linen-Bed covers, pillow covers, mattress and blanket covers, duvet covers, cushions, throw pillows, shams, bolster, etc. Kitchen linen-Disc cloth, cheese cloth, table runner, hand towel, freeze cover, covers for other appliances such as tea kettle cover, table cloth , kitchen apron, Wipers-woven & non woven wiper.

Module-II

Home Decorative: (8Hrs)

Floor coverings - carpets, rugs/durries, wooden and metal tiles, bamboos Wall covering – lighting, wall art, wall hanging and decorative frames, Home decorative– Furniture, Draperies, Curtains, Decorating Accessories(flower vases, sculptures, decorative plants, aquarium, etc.).

Module – III

Home Furnishings: (10Hrs)

Requirements in terms of decoration according to different rooms,(Living room, Bedroom room, dining room, kitchen room, store room, guest room, bath room, use of acoustic fabric inside the room).Curtains and draperies: Advances in Home decoration - Draperies–Choice of Fabrics–Curtains–Types of Developments in Finishing of Draperies – Developments in tucks and Pleats and uses of Drapery Rods, Hooks, Tape Rings and Pins. Arrangement: - flower arrangement, furniture arrangement

Learning Resources:

1. Textile And clothing by Garg, Saini& Gupta
2. Elements of Fashion And Apparel Design by Sumati G.J
3. Textile & Clothing -Garg, Saini, Gupta

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Subject Name: **BRAND DESIGN AND MANAGEMENT (3)** Code: **UPEFT702**

Course Outcomes:
After successful completion of this course, the students will be able to develop knowledge and skills of :

- Branding concepts.
- Designing and establishment of brands.
- Management of different brands.
- Competing with new and existing brands.
- Global Branding techniques.
- Strategic management of foreign brands.

Module-I
Introduction: (10Hrs)
Basic understanding of brands, definition, branding concepts, brand name and logos, criteria for choosing brand elements, Significance of brands, different types of brands- core brands, store brands etc.

Module-II
Brand Management: (10Hrs)
Strategic management of brands, brand management process, brand building, strong brands, brand positioning, establishment of new brand, brand values, brand vision, brand elements, branding for global markets, competing with existing and new brand, foreign branding techniques, brand layout programmes, brand promotion method, brand ambassadors, their role, online brand promotion, methods of online brand promotions.

Module-III
Brand Adoption Practices:(10Hrs)
Brand adoption techniques, definition, different types, of brand extension, factors influencing decision for extension, rebranding and re-launching of old and new brand. Measuring brand performance, brand equity management, store brand strategy, benefits for the customers and retailers, brand managers, their role, branding challenges and opportunities.

Learning Resources:
1. Brand Management- Text and cases, Mathew, Macmillian 2008.
2. Building Brand Value, Five steps of Builiding Powerful Brands, M.G. Parmeswaran,2006,NewDelhi, Tata McGraw Hill,
3. Brand Management, H.V.Verma,2004, NewDelhi, Excel Books.
4. Strategic Management, Kelvin Lane Keller, M.G.Rameswaram, Third Edition.

Subject Name: **FUNCTIONAL AND SMART APPARELS (3)** Code: **UPEFT703**

Course Outcomes:
After successful completion of this course, the students will be able to develop knowledge and skills of :

- Concept of smart textiles and clothing.
- Various sectors of functional textiles/ clothing.
- Manufacturing of functional textiles and apparels with their properties.
- Product development of smart and functional apparels.

Module –I
Concept of Smart Textiles: **(10Hrs)**
Detailed study (objectives, properties, fibres used & end uses) of the Smart Garments like Chameleonic Garments, Garment made from Shape memory and Phase Change Material, Self Cleaning Fabrics, Wearable Electronics (Garments with sensors and computing devices).

Module –II
Protective Clothing: (08Hrs)
Study (objectives, properties, fibres used & end uses) of functional fabrics like thermal.
protective fabrics **,**water proof & water breathable fabrics, high tenacity fabrics etc.
Flame retardant & Fire fighters clothing.

Module –III
High performance Apparels: (12Hrs)
Sports wear. Radiation Protective clothing from UV , x-ray, alpha ray, beta ray , gamma ray. Bullet proof and ballistic protective clothing. Defence clothing,
Space suit. Garment for medical & hospital use, Antimicrobial textile wear, Pathogen resistant surgical gown **,** Clothing for protection against chemicals &nuclear

Learning Resources:

1. Industrial Textile by Sabit Adnoor.
2. Pushpa, B., and Sengupta, A.K., "Industrial Application of Textiles for Filteration and Coated fabrics",Textile Progress Vol.14, 1992

FASHION TECHNOLOGY COURSE STRUCTURE
B. Tech. (AUTONOMOUS)
Duration: 4 years (Eight Semesters)

Subject Name: **TECHNICAL TEXTILES (3)** Code: **UPEFT704**

Course Outcomes:
After successful completion of this course, the students will be able to develop knowledge and skills of :

- Classification of technical textiles.
- Manufacturing of technical textiles and their properties.
- Functions and property requirements of technical textiles and their applications in different fields.
- Demonstration in the product development of technical textiles.

Module-I
Introduction: **(10Hrs)**
Definition and scope for technical textiles, present status and future of technical textile. Brief idea about technical fibres - Carbon fibres-Aramid and related fibres, Glass threads, composite material. Definition of filtration parameters, theory of dust collection and solid liquid separation, filtration requirements, concept of pore size and particle size, role of fiber, fabric construction and finishing treatments. Agro textiles**:** Fibres, Fabric Construction details – Properties and applications.

Module-II
Protective Clothing: **(08Hrs)**
Brief idea about different type of protective clothing, functional requirement of textiles in defense including ballistic protection materials and parachute cloth, temperature and flame retardant clothing, chemical protective clothing, water proof breathable fabrics. Sports and recreation textiles: Functional requirement of different types of product and their construction.

Module-III
Medical, Geo, Automotive Textiles: **(12Hrs)**
Classification of medical textiles. Medical Textiles: Surgical Textiles and Sutures. Cardio. Vascular Textiles (Knitted cardiac biological valves). Dialytic Textiles, Hollow fibres as dialysis membrane, Hospital Textiles- operating and post operating clothing, disposable drapes. Textiles for sanitary applications. Geotextiles: Brief idea about geo-synthetics and their uses, essential properties of geotextiles, geotextile, testing and evaluation, application examples of geotextiles.
Automotive textiles: Brief idea about the important properties and requirements in automotive textiles, textiles components in tyre, tyre structure and design.Textiles in agriculture, electronics, power transmission belting, hoses, canvas covers and tarpaulins.

Learning Resources:

1. –Handbook of Technical Textiles|, Ed. A R Horrocks and S C Anand, Woodhead Publication Ltd., Cambridge (2000).
2. –Engineering with Geosynthetics|, Ed. G V Rao and G V S Raju, Tata McGraw Hill Publishing Co. Ltd., New Delhi (1990).
3. –Industrial Textile|, Ed., J Svedova, Elsevier, New York (1990).
4. –Modern Textile Characterization Methods|, Ed. M Raheel, Marcel Dekker, Inc. (1996).
5. Mukhopadhyay S K and Partridge J F, –Automotive Textiles|, Vol. 29, No. ., The Textile Institute (1999).
6. Sabit Adanur, –Wellington Sears Handbook of Industrial Textiles|, Technomic publishing company Inc., USA, 1995
7. Pushpa, B., and Sengupta, A.K., "Industrial Application of Textiles for Filteration and Coated fabrics", Textile Progress Vol.14, 1992

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Entrepreneurship Development (3-0-0)

Prerequisites:

1. Organizational Behaviour.
2. English.

Module 1: (06 Hours)

Entrepreneurship: Concept of Entrepreneurship and Intrapreneurship, Types of Entrepreneur, Nature and Importance, Entrepreneurial Motivation and Achievement, Entrepreneurial Personality & Traits and Entrepreneurial Skills.

Module 2: (08 Hours)

Entrepreneurial Environment, Identification of Opportunities, Converting Business, Opportunities into reality. Start-ups and business incubation, Skill Development. Setting up a Small Enterprise. Issues relating to location, Environmental Problems and Industrial Policies and Regulations.

Module 3: (08 Hours)

Basics of Accounting, Terms: Assets, Liabilities, Equity, Revenue, Expense, Working capital, Marketing Mix and STP.
HRM: Concepts and Function, Labour Laws- Factories Act, Organizational sup- port services - Central and State Government, Incentives and Subsidies.

Module 4: (08 Hours)

Sickness of Small-Scale Industries, Causes and symptoms of sickness, cures of sickness, Role of Banks and Government in reviving sick industries.

Text Books:

1. Entrepreneurship Development and Management, Vasant Desai, HPH.
2. Entrepreneurship Management, Bholanath Dutta, Excel Books.
3. Entrepreneurial Development, Sangeeta Sharma, PHI.
4. Entrepreneurship, Rajeev Roy, Oxford University Press.

FASHION TECHNOLOGY COURSE STRUCTURE
B. Tech. (AUTONOMOUS)
Duration: 4 years (Eight Semesters)

Detailed Syllabus (8th Semester)

Subject Name: **APPAREL MERCHANDISING AND RETAILING (3)** Code: **UPEFT801**

Course Outcomes:
After successful completion of this course, the students will be able to develop knowledge and skills of :

- Concepts of Fashion marketing, national and international level..
- Status of global fashion market.
- Concepts of fashion retailing and merchandising.
- Concepts of fashion business mix, pricing, retail store management**.**

Module-I
Fashion Marketing: (08 Hrs)
Introduction to apparel marketing, objectives of marketing; Market segmentation; Fashion marketing mix; PLC and New product development; Scope ; potential of apparel product in domestic ; international market; Exploration of fashion industry; Fashion Promotion; Present scenario of apparel industry in India – challenges & prospects of these industries.

Module – II
Fashion Retailing: (10Hrs)
Introduction to Retailing; Types of retailers, Types of retail ownership, elements of retail mix; types of retail locations, Benefits of retailing; Role of a retail merchandiser and buyer; Merchandise planning, Retail pricing and repricing, Retail pricing polies/ strategies (Market Skimming, Market Penetration, Price bundling, Leader pricing, Everyday low pricing, Odd pricing, etc.) Retail Store Design.

Module-III
Fashion Merchandising: (12Hrs)
Introduction to Merchandising; Types of merchandising; Merchandising mix; Merchandising Planning; Elements of merchandising; Assortment planning; Costing& pricing; Pricing; Concept of fashion forecasting; Range development process; General & Specific range development. Visual Merchandising: Importance of Visual Display. Fashion communication – Visual Merchandising – advantages – 3D visual merchandising system – optimizing techniques in retail space.

Learning Resources:

1. Fashion Marketing – Mike Easy
2. Principle of Marketing - Philip Kotler and Armstrong
3. Marketing Management - Philip Kotler and Kevin Keller
4. Mastering Fashion Marketing - Tim Jackson and David Shaw
5. Fashion Buying & Merchandising, Sidney Packard
6. Apparel Manufacturing, Ruth E. Glock& Grace I. Kunz

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Subject Name: **COSTING AND FINANCIAL MANAGEMENT IN APPAREL INDUSTRY(3)** Code: **UPEFT801**

Course Outcomes:
After successful completion of this course, the students will be able to develop knowledge and skills of :

- Understanding the basics of cost and financial accounting, garment costing, understanding cost components and, marginal cost variance and budgets.
- Various sources of long term financing.
- Understanding the needs of financial terminologies and their implications used in the industry.

Module - I
Introduction to Cost Accounting: (06 Hrs)
Responsibility accounting, uses of cost accounting, elements ofcost,Direct material,Direct labour, Factory overhead;cost of goods manufactured statements, cost behavior patterns in the apparel industry-fixed variable, semi variable,job order for process costing

Module - II
Accounting for factory overhead: (08Hrs)
Capacity level concepts, production and service departments direct and indirect costs over and under applied overhead, cost volume profit analysis; Breakeven analysis: Contribution margin, Variable Cost, Marginal income, sales mix by garment style, effect of volume change, Price/column analysis, CVP Analysis

Module - III
Apparel Marketing cost Analysis: (16 Hrs)
Marketing cost accounting, marketing cost standards, variance analysis for marketing cost, effective variance ,price variance; Determining Pricing of apparel products: Price elasticity of demand and supply, sample costing-marginal revenue and marginal cost, cost plus pricing methods; Full cost pricing, conversion cost pricing differential cost pricing, variable cost pricing, direct cost pricing derivation of cost of apparel products-woven/knits; The budgeting process: Budgeting principles for the apparel industry, fixed vs. variable budget, master budget. Introduction to Financial Management: Objectives, Scope and meaning of Financial Management, Financial Statement Analysis, Basic concepts of Fund flow and Cash Flow

Learning Resources:

1. RichordD.IrwinIcn,‖Principles of cost Accounting:Managerial Applications‖Revised by GayleRayburn,1983
2. Sultan Chand& sons, ‖Management Accounting‖New Delhi, 2nd edition 1998
3. Dr.S.N. Maheshwari, Principles of Management Accounting, Sixteenth Edition
4. Khan M.YandP.K.Jain, ―Management Accounting‖, 2012,6th Edition

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FASHION TECHNOLOGY COURSE STRUCTURE
B. Tech. (AUTONOMOUS)
Duration: 4 years (Eight Semesters)

OPEN ELECTIVES

Subject Name: **FUNDAMENTAL TECHNIQUES OF APPAREL DESIGN (3)** Code: **UOEFT501**

Course Outcomes:
After successful completion of this course, the students will be able to develop knowledge and skills of :

- Understanding of basic principle of design.
- Different fashion terminology.
- Playing with different colors.
- Understanding of concept of fashion illustration.

Module-I

Introduction to Fashion: (10Hrs)

Fashion origin, evolution with examples from different eras till French revolution, Fashion cycles, Fashion theories. Fashion terminology: fashion, style, fad, classic, boutique, trends, designer, silhouette, Hi fashion, Fashion/selling seasons and knock-offs. Types of fashion: haute couture, Prêt-a-porter and Mass Fashion. Levels of Fashion Acceptance-Fashion leader, fashion role model, fashion follower, Fashion victims.

Module-II

Sketching Techniques: (08Hrs)

Basic sketching techniques and sketching from life, Perspective and its uses, Grid technique of rendering. Introduction to Anatomy, study of bone and muscular structure, proportions of males, females and children. Study of face, torso, legs and arms Introduction to Fashion Art, Proportion and the Fashion Figure - 8 head, 10 head, 12 head theory of fashion drawing.

Module-III

Fashion Illustrations: (12Hrs)

Elements of Fashion illustration: Introduction to Fashion illustration - History, importance, artists and illustrators of national and international repute. Elements of Design (point, line, form, shape, space, size, texture and colour), Principles of Design (harmony, proportion, balance, rhythm and emphasis), Colour Theory (Prang, Munsellcolour system, Pantone Colours, colour wheel, colour value scale, grey scale, colour schemes, colour psychology, colour and emotions, Indian approach to colour), Modification of colour as a formation of tints, shades &colour greys .Change in Hue, Change in value, Neutralized Colour or coloured grey. Achromatic Harmony, Monochromatic Harmony, Analogues Harmony, Complementary Harmony, Polychromatic Harmony.

Learning Resources:

1. Inside Fashion Design, Sharon Lee Tats
2. Colour Harmony, Bride N. Whelan, Rockport Publishers.
3. The Costumes and Textiles of India, JamilaBrijBhusan
4. Soamn, Jullian, „Professional Fashion illustration" B.T. Batslord, London 1995 .

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Subject Name: **VISUAL ART AND ILLUSTRATION TECHNIQUES (3)** Code: **UOEFT601**

Course Outcomes:

After successful completion of this course, the students will be able to develop knowledge and skills of :

- Understanding of basic principles of design and color, concepts, media and formats, and the ability to apply them to a specific aesthetic intent.
- Traditions, conventions, and evolutions of the discipline as related to issues of representation, illusion, and meaning.
- Development of solutions to aesthetic and design problems should continue throughout the degree program.
- The ability to synthesize the use of drawing, two-dimensional design, and color, beginning with basic studies and continuing throughout the degree program toward the development of advanced capabilities.
- Using of basic tools, techniques, and processes sufficient to work from concept to finished product, including knowledge of paints and surfaces.

Module- I

Pencil Shading: **(08 hours)**

Fashion sketching-origin, important and creative use. Pencil shading-values or gradation, pressure on pencil effect, three different ways of get gradation: stocks\ hatching \cross hatching, stippling smudging; Colorings & Rendering Techniques: Tools and Materials: Pencil, Inks, Brushes, Crayons, Pastels, Pencil, Water soluble pencils, Poster, Water Color, Felt Pens, Stedler Color, Good Quality Paper, Swatches. Fabric rendering**:** Textures and Patterns**:** Illustration in Textural Techniques Different Varieties of Fabric: Soft Fabrics, denim, Jersey, Chiffon, Satin, and Transparent Fabric

Module-II

Working Drawing & Sketching: (08 hours)

Composition of female postures: S-posture, X-posture, T- posture, A- posture, straight, Z- posture Working Drawing & Sketching:-Composition of female postures: S-posture, X-posture, T- posture, A- posture, straight, Z- posture. Drawing Female Figures:-Drawing female figure free hand; Creating the profile figure; Profile pose; Achieving balance and movement; The fuller figure; Drawing legs: Form and shape; Drawing Arms: Form and Shape; Drawing hands; Posing hands for a fashion sketch; Drawing feet; Drawing the Head; Sketching women‘s jackets; Sketching women‘s tops and blouses; Sketching women‘s lounge wear; Sketching women‘s coats

Module-III

Illustration & Development of costume: (14Hrs)

Developing & Draping of Female Garments of Fashion Poses in Different Styles. Draping Figure with Surface Ornamentation, Illustration of Casual Wear, Formal Wear. Stylization figure. Different types of Garment for Female. Stylized rendering**:** Rendering Effects, Rendering Lace. Draping of Different Garment: Gathers, Folds, Pleats Showing Fullness in Garment Sketching Children Figures**:-**Children age groups; Drawing children figure proportions; Drawing children‘s arms and legs; Drawing children‘s hands; Drawing children‘s legs and feet; Posing children figures; Dressing children; Drawing children‘s head; Hair styles for children. Illustration& Sketching Accessories:-Sketching Jewellery; necklace,ears ring,nose ring,
Sketching sun glasses; Sketching hats;purse,bags,belts,shoes, Detailing for other fashion accessories.
Fashion Accessories:-Necklace, Ears Ring, Nose Ring, Purse, Bags, Belts, Hats, Shoes, Spectacles, Foot Wear

Learning Resources:

1. Fashion Illustration by Manmeets Sodhia Kalyani Publisher
2. Design Studies by Manmeets Sodhia Kalyani Publisher
3. Fashion Illustration for Designers by Kathryn Hagen Pearson Publisher

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FASHION TECHNOLOGY COURSE STRUCTURE
B. Tech. (AUTONOMOUS)
Duration: 4 years (Eight Semesters)

Subject Name: **FASHION PHOTOGRAPHY (3)** Code: **UOEFT701**

Course Outcomes:
After successful completion of this course, the students will be able to develop knowledge and skills of :

- Entire medium of visual image from technical as well as from an art point of view.
- Understanding of the importance of visualization and observation in fashion photography.
- Utilization of photography as a medium of effective communication.

Module-I

Introduction to Photography: (12Hrs)
History and origin**,** Various parts of still Camera, Use of lens, Exposure , Depth of Field, Use of light and its effect, contrast and its use, Photographing using natural light, Close-up photography, Sensor, Format, Pixel, Quality of image, Resolution, Factors affecting picture quality, Understanding White Balance in Digital Photography , Color Temperature, How does the Light Affect the Color? Compression (lossy and lossless), Storing**,** Composition: Rule of third, golden points, Color Vision, Digital camera and human Eye comparison, Primary and Secondary colour, Mixture of colours, use of colour to create mood, Role of light in quality photography, Use of natural light, Use of artificial light to create natural effect.

Module-II
Fashion Photography: (10Hrs)
Human Photography, Product Photography, Emotion, style, posture, self promotion, visual aesthetics of photography, Role of light in quality photography, Use of natural light, Use of artificial light to create natural effect. Selection of photography, assistants, stylist, make- up artist and hair stylist, selection of the model.

Module-III
Quality of photograph : (08Hrs)
JPEG, TIFF and RAW,RAW Vs JPEG, Sensitivity, Sensor size, crop factor, Normal lens for various format, pixel type, Bit depth, Byer Arrey, Display, Printing, DPI and PPI, storage device, Digital Camera Interface. Post production: Choosing format size while giving order for printing and selecting printing papers.

Learning Resources:

1. Fashion Photography: A Complete Guide to the Tools and Techniques of the Trade. Author: Bruce Smith. Publisher: Crown Publishing Group. 2008.
2. The New Art of Photographing Nature. Author: ART WOLFE. Publisher: RANDOM HOUSE INDIA. 2013

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Subject Name: **FASHION BUSINESS AND FORECASTING (3)** Code: **UOEFT702**

Course Outcomes:
After successful completion of this course, the students will be able to develop knowledge and skills of :

- Understanding the nature of fashion business, elements and challenges associated with Fashion Industry.
- Understanding the five areas of Fashion Business.
- Understanding on principles of marketing, factors affecting domestic and international market, fashion trends and consumer behavior.
- Understanding the principles of fashion forecasting with all aspects.

Module-I
Fashion Business: (10Hrs)
Definition of Fashion, Evolution of Fashion,- Terminology of Fashion, Principles of Fashion movement, Economic importance of Fashion Business, Four levels of Fashion (Primary level, Secondary level, the Retail level & Auxiliary level),Theory of Clothing Origin, Fashion cycle, Theories of fashion adoption, International Fashion centers.

Module-II
Fashion Environment: (05Hrs)
Environment of Fashion, Market segmentation (Demographics, Geographic, Psychographics &Behavioral), Economic Environment, Social Environment, Fashion Categories, Men‘s wear, Women‘s Wear and Kid‘s wear.

Module-III
Fashion Forecasting: (15Hrs)
Meaning of Fashion Forecasting , The role of a forecaster, The precision of the forecast, The fashion, industry‘s components, structure of the fashion industry, fashion timetable, Information Network , selling strategy. Process in Forecasting - Primary sources, Secondary sources, Tertiary sources , Tracking sales, Competition, Demographics, Value & life style, Publication, Forecasting services , Plethora influences, Observation posts, Fashion of involvement, New uses of products, Old neighborhood. Fashion marketing research – Purpose of research - research design & data sources Sampling methods – data Collection – Forecasting Fashion – Market Segmentation - marketing mix.

Learning Resources:

1. Elaine Stone,‖ Fashion Merchandising‖, Blackwell Science Ltd., 2000.
2. Brannon Evelyn L –Fashion Forecasting‖ Fairchild Books, New York 3rd,2010
3. Perna Rita –Fashion Forecasting‖ Fairchild Books, New York 1992.
4. –The Dynamics of Fashion‖ Elaine Stone Fairchild Publication, 2008

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Subject Name: **VISUAL MERCHANDSING (3)** Code: **UOEFT801**

Course Outcomes:

After successful completion of this course, the students will be able to develop knowledge and skills of:

- Principle and Functions of Visual merchandiser.
- Techniques of virtual business.
- Managing space in a retail store.
- Displaying techniques.
- Store/Mall management.

Module-I

VM Concepts: (10Hrs)

Meaning & definitions, Concept, Principles and functions of VM, VM as an Art or Science, Definitions, Functions, Display basics. Store Personality & Image, Importance of the need to understand the Store Personality and Image in the context of the target market.

Module-II

VM Designing: (10Hrs)

Elements of Exterior Design, Signage, Façade, Entrance, Banners, Awnings/Marquee. Window Display, Elements of Interior Design, Atmospherics, Merchandise Grouping, Department location, Layout/Circulation Plan Planogram & Wall elevations. Role in effective merchandising Principles of Merchandise Presentation Categories, Dominance Factor, Cross Merchandising, Impulse buying. Displays, Importance of display, Types of display and display settings. Store Window, Detailed study of display for store windows – closed back, open back, construction, glare, effective use of elements and principles of design.

Module-III

VM Planning: (10Hrs)

Mannequins Space Planning Fixtures, Props Lighting Mannequins and alternatives to mannequins, Space Planning & Fixtures Types of Props & 3D Forms Systems & In store furniture and lighting. VM Planning Implementation & Control, Calendar Planning, Importance of festivals in the Indian context. Sales Tracking, QA & SOPs, Exhibit and trade show design. Principles for New Store Launch/Existing Stores/Clearance Sales.

Learning Resources:

1. Fashion Buying & Merchandising, Sidney Packard.
2. Fashion Marketing & Merchandising: Student Workbook. Author: Mary Wolfe. Publisher: Goodheart-Wilcox Publisher, 2008
3. Silent Selling, Judy Bell and Kate Ternus, Blooms Bury, Publication.

Subject Name: **SMART AND FUNCTIONAL APPARELS (3)** Code: **UOEFT802**

Course Outcomes:
After successful completion of this course, the students will be able to develop knowledge and skills of :

- Concept of smart textiles and clothing.
- Various sectors of functional textiles/ clothing.
- Manufacturing of functional textiles and apparels with their properties.
- Product development of smart and functional apparels.

Module –I
Concept of Smart Textiles: **(10Hrs)**
Detailed study (objectives, properties, fibres used & end uses) of the Smart Garments like Chameleonic Garments, Garment made from Shape memory and Phase Change Material, Self Cleaning Fabrics, Wearable Electronics (Garments with sensors and computing devices).

Module –II
Protective Clothing: (08Hrs)
Study (objectives, properties, fibres used & end uses) of functional fabrics like thermal. protective fabrics **,**water proof & water breathable fabrics, high tenacity fabrics etc. Flame retardant & Fire fighters clothing.

Module –III
High performance Apparels: (12Hrs)
Sports wear. Radiation Protective clothing from UV, x-ray, alpha ray, beta ray , gamma ray. Bullet proof and ballistic protective clothing. Defence clothing, Space suit. Garment for medical & hospital use, Antimicrobial textile wear, Pathogen resistant surgical gown **,** Clothing for protection against chemicals &nuclear

Learning Resources:

3. Industrial Textile by Sabit Adnoor.
4. Pushpa, B., and Sengupta, A.K., "Industrial Application of Textiles for Filteration and Coated fabrics",Textile Progress Vol.14, 1992

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