DEPARTMENT OF FASHION TECHNOLOGY

Vision

Achieve excellence in academics and research by bestowing technological prowess and managerial acumen to our students to face the global challenges of the clothing industry within the context of professional and social responsibility.

Mission

- Disseminate core competencies with a comprehensive curriculum encompassing apparel design, manufacture and management.
- Stimulate analytical and creative thinking to transform the students as competent professionals and researchers.
- Promote collaborations with industry to comprehend global practices leading to excellence.
- Mould the students as socially responsible technocrats and entrepreneurs to develop products and offer services useful for society.

Programme Educational Objectives

- 1. To provide strong foundation to graduates to pursue a successful profession or higher studies
- 2. To enrich competence of graduates to identify problems in the apparel domain and to provide techno-economic solutions focusing on the need of the industry and society.
- 3. To imbibe awareness among graduates on the significance of professional and social ethics in their professional career.

Program Outcomes

- 1. Acquire knowledge on the principles of mathematics, science and basic engineering, and apply the same in apparel engineering processes.
- 2. Analyze and identify required parameters vital to design and manufacture apparel products suiting the needs of the market
- 3. Acquire creative and innovative skills to design apparels and contribute to the design of systems, components of processes with due

considerations given to public health, safety, cultural, societal and environmental factors.

- 4. Acquire skills to conduct experiments/investigations and interpret data with reference to systems and standards to provide valid inference in apparel engineering.
- 5. Gain skill to use modern design and engineering tools towards optimum utilization of resources in apparel product and process development.
- 6. Obtain knowledge of societal, health, safety, legal and cultural issues related to fashion and textile technology and understand the accountability and responsibility while undertaking engineering technology practice in the current situations
- 7. Understand the impact of sustainable development in apparel manufacturing processes.
- 8. Understand the commitment towards professional ethics and responsibilities in the entire apparel business processes
- 9. Acquire capability to contribute significantly as an individual and as a team player all through the Apparel supply chain.
- 10. Acquire skill to effectively communicate in written, oral and illustrative formats to put forth solutions, reports and effectively present them in precise and clear manner in the apparel supply chain from concept to consumer.
- 11. Apply the knowledge, skill and attitude as a team player in initiating, executing and managing projects in the areas of design, manufacture, marketing and entrepreneurship in multi-disciplinary environments.
- 12. Recognize the need for, and to have the ability to engage in life-long learning in the context of technological change in the apparel field.

SEMESTER – I (COMMON TO ALL BRANCHES OF ENGINEERING & TECHNOLOGY)

Code No.	Course Title	L	Т	Р	С	
	THEORY					
U14EN <i>T</i> 101	Functional English I	2	0	2	3	
U14MA <i>T</i> 101	Engineering Mathematics – I	3	1	0	4	
U14PH <i>T</i> 101	Engineering Physics	3	0	0	3	
U14CH <i>T</i> 101	Engineering Chemistry	3	0	0	3	
U14ME <i>T</i> 101	Engineering Graphics	2	0	3	3	
U14CS <i>T</i> 101	Structured Programming using 'C'	3	1	0	4	
PRACTICAL						
U14PHP101/	Physics Laboratory / Chemistry laboratory*	0	0	3	1	
U14CHP101			Ŭ	5	1	
U14MEP101	Engineering Practices Laboratory	0	0	3	1	
U14CSP101	Structured Programming Laboratory using 'C'	0	0	3	1	
U14GHP101	Personal Values	1	0	1	1	

TOTAL – 34 HOURS

TOTAL CREDITS - 24

*Physics Lab is offered for 50% of the classes and Chemistry lab for remaining 50% of the classes in the first semester. In the second semester the labs are interchanged.

SEMESTER	AE, CE, CSE, IT, ME, MCE	AU, BIO, EEE, ECE, EIE, FT, TXT
First semester	U14PHP101- PHYSICS LAB	U14CHP101 - CHEMISTRY LAB
Second	U14CHP201- CHEMISTRY	U14PHP 201 - PHYSICS LAB
semester	LAB	
	(Except CSE Branch)	

B.Tech - TEXTILE TECHNOLOGY (FASHION TECHNOLOGY)

SEMESTER – II

Code No.	Course Title	L	Т	Р	С	
THEORY						
U14EN <i>T</i> 201	Functional English II	2	0	2	3	
U14MAT201	Engineering Mathematics – II	3	1	0	4	
U14PH <i>T</i> 204	Applied Physics	3	0	0	3	
U14CH <i>T</i> 204	Chemistry for Textiles	3	0	0	3	
U14FT <i>T</i> 201	Fiber Science and Yarn Technology	3	0	0	3	
U14FT <i>T</i> 202	Weaving Technology	3	0	0	3	
PRACTICAL						
U14PHP201	Physics Laboratory	0	0	3	1	
U14FTP201	Textile Production Process Laboratory	0	0	3	1	
U14CSP211	Computing Laboratory	0	0	3	1	
U14GHP201	Family&Professional Values	1	0	1	1	

TOTAL – 31 HOURS

TOTAL CREDIT – 23

KUMARAGURU COLLEGE OF TECHNOLOGY COIMBATORE – 641 049 REGULATION 2014 B. TECH. FASHION TECHNOLOGY CURRICULUM

SEMESTER III

Code No.	Course Title	L	Τ	P	С
	Theory				
U14MA <i>T</i> 305	Probability and Applied Statistics	3	1	0	4
U14FT <i>T</i> 301	Concepts of Fashion and Design	3	0	0	3
U14FTT302	Knitting Technology	3	0	0	3
111/FT7202	Basic Pattern Making and	2	0	0	2
014617303	Adaptation	5	0	0	3
U14FT <i>T</i> 304	Garment components fabrication	3	0	0	3
	Basics of Electrical and Electronics	3	0	0	2
014 E 1511	Engineering			0	5
	Practical				
U14FTP301	Fashion Design Laboratory - I	0	0	3	1
	Garment Components Fabrication	0	0	2	1
014612302	Laboratory	0	0	3	1
U14EEP311	Basics of Electrical & Electronics	0	0	2	1
	Engineering Laboratory	U	U	5	
U14GHP301	Social values	1	0	1	1

TOTAL CREDITS: 23

SEMESTER IV

Code No.	Course Title	L	Τ	Р	С	
Theory						
U14MA <i>T</i> 401	Numerical Methods	3	1	0	4	
U14GS <i>T</i> 001	Environmental Science and	3	0	0	3	
	Engineering				5	
U14FT <i>T</i> 401	Apparel Production Technology	3	0	0	3	
U14FT <i>T</i> 402	Apparel Machinery and Equipment	3	0	0	3	

U14FT <i>T</i> 403	Fabric Structure and Design	3	1	0	4		
U14MET407	Basics of Mechanical Engineering	3	0	0	3		
	Practical						
U14FT <i>P</i> 401	Fashion Design Laboratory - II	0	0	4	2		
U14FTP402	Apparel Machinery Laboratory	0	0	4	2		
U14FT <i>P</i> 403	Fabric Structure and Design Analysis	0	0	4	2		
	Laboratory	0	0	т	2		
U14GHP401	National and Global Values	1	0	1	1		

TOTAL CREDITS: 27

SEMESTER V

Code No.	Course Title	L	Т	Р	С
	Theory				
111/FT7501	Fashion Apparel Design and	3	0	0	3
014111301	Development	5	U	U	5
111/FT7502	Surface Ornamentation and	3	1	0	Λ
014111302	Accessories	5	1	U	7
U14FT <i>T</i> 503	Clothing Science and Fit	3	0	0	3
U14FT <i>T</i> 504	Textile Chemical Processing	3	0	0	3
	Textile and Apparel Quality	2	0	0	2
0141 17505	Evaluation	5	U	U	5
E1	Elective I	3	0	0	3
	Practical				
U14FTP501	Apparel Production Laboratory - I	0	0	4	2
	Textile Chemical Processing	0	0	Δ	r
014617302	Laboratory	U	U	-	Δ.
	Textile Quality Evaluation	0	0	4	2
	Laboratory	U			Δ.
U14FTP504	Industrial Training*	0	0	-	1

* - Industrial Training to be undertaken during the 4th semester summer vacation - Internal evaluation only

TOTAL CREDITS: 26

SEMESTER V	/]
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Code No.	Course Title	L	Т	P	С		
	Theory						
U14GS <i>T</i> 007	Professional Ethics	3	0	0	3		
U14FT <i>T</i> 601	Apparel Product Development	3	0	0	3		
U14FT <i>T</i> 602	Apparel Merchandising	3	0	0	3		
U14FT <i>T</i> 603	Apparel Production Planning and	2	1	0	Λ		
	Control	5	1	U	+		
U14FT <i>T</i> 604	Apparel Finishing and Care	3	0	0	3		
E2	Elective II	3	0	0	3		
	Practical						
U14FTP601	Apparel Production Laboratory - II	0	0	4	2		
U14FTP602	Apparel CAD Laboratory	0	0	4	2		
U14ENP601	Communication Skill Laboratory	0	0	3	1		
U14FTP603	Mini Project*	0	0	-	1		

* - Mini Project to be undertaken during the 5th semester vacation - Internal evaluation only

TOTAL CREDITS: 25

SEMESTER VII

Code No.	Course Title	L	Т	Р	С		
Theory							
U14FT7701	Industrial Engineering in Apparel Manufacturing	3	0	0	3		
U14FT <i>T</i> 702	Social Compliance for Apparel Industry	3	0	0	3		
U14FT <i>T</i> 703	Quality Assurance in Apparel Production	3	0	0	3		
U14FT7704	Costing in Apparel Industry	3	1	0	4		

U14FT7705	Apparel Export Management	3	0	0	3
E3	Elective III	3	0	0	3
	Practical				
U14FTP701	Apparel Quality Evaluation	0	0	4	2
	Laboratory		U		2
U14FTP702	Portfolio Presentation	0	0	4	2
U14FTP703	Project Work - Phase I	0	0	4	2

TOTAL CREDITS: 24

SEMESTER VIII

Code No.	Course Title	L	Т	P	С	
	Theory					
E4	Elective IV	3	0	0	3	
E5	Elective V	3	0	0	3	
E6	Elective VI	3	0	0	3	
Practical						
U14FTP801	Project Work – Phase II	0	0	18	6	
TOTAL CREDITS:						

ELECTIVES FOR FIFTH SEMESTER

Code No.	Course Title	L	Т	Р	С		
Elective I							
U14FTE101	Fashion Photography	3	0	0	3		
U14FTE102	Visual Merchandising	3	0	0	3		
U14FTE103	Garment Trims and Accessories	3	0	0	3		
U14CSE141	Object Oriented Programming with C++	2	0	2	3		

ELECTIVES FOR SIXTH SEMESTER

Code No.	Course Title	L	Т	Р	С
	Elective II				
U14FTE201	Intimate Apparels	3	0	0	3

U14FTE202	Home Furnishings	3	0	0	3
U14GS <i>T</i> 003	Principles of Management	3	0	0	3
U14GS <i>T</i> 004	Operations Research	3	0	0	3

ELECTIVES FOR SEVENTH SEMESTER

Code No.	Course Title	L	Т	Р	С			
	Elective III							
	Fashion Communication and	3	0	0	3			
014612301	Marketing	5	0	0	5			
	Logistics and Supply Chain	3	0	0	2			
$0.14\Gamma 1E302$	Management	3	0	0	3			
U14FTE303	Functional Clothing	3	0	0	3			
U14FTE304	Fashion Retail Management	3	0	0	3			
U14GS <i>T</i> 002	Total Quality Management	3	0	0	3			

ELECTIVES FOR EIGHTH SEMESTER

Code No.	Course Title	L	Τ	Р	С
	Elective IV				
1114FT <i>F</i> 401	Application of Computers in Apparel	3	0	0	3
	Industry	5	0	0	5
U14FTE402	Leather Apparel Technology	3	0	0	3
	Global Marketing and Sourcing	3	0	0	3
0141 12403	Strategies	5	0	0	5
U14FT <i>E</i> 404	Technical Textiles	3	0	0	3
	Elective V				
U14FTE501	Nonwovens	3	0	0	3
U14FTE502	Theory of Textile Structures	3	0	0	3
	Application of ERP and MIS in	2	0	0	2
0141 12505	Apparel Industry	3	0	0	3
U14FTE504	Apparel Brand Management	3	0	0	3
Elective VI					
U14FTE601	Entrepreneurship Development	3	0	0	3
U14FTE602	Energy Management in Apparel	3	0	0	3

	Industry				
U14GS7005	Engineering Economics and	3	0	0	3
014057005	Financial Management	5	U	U	5
U14GS <i>T</i> 006	Product Design and Development	3	0	0	3

ONE CREDIT COURSES

SL No	Course Title	Industry that will offer the
51. 190.	Course Thie	course
U14FTIN01	Design of experiments	Research
	Design of experiments	Institute/consultants
U14FTIN02	New trends in printing	Apparel Industry
U14FTIN03	Waste elimination and value	Apparel Industry
	stream mapping in apparel	
	industry	
U14FTIN04	Application of six sigma in	Apparel Industry
	apparel manufacture	
U14FTIN05	Certification procedures for	Apparel
	product and process in	Industry/Certification
	apparel industry	Agencies
U14FTIN06	Sewing machinery dynamics	Apparel Machinery
	Sewing machinery dynamics	Manufacturers/Suppliers
U14FTIN07	Draping Techniques	Designers
U14FTIN08	Recent Industrial Engineering	Apparel
	Practices in Apparel Industry	Industry/Consultants

SEMESTER I

U14EN7101/ FUNCTIONAL ENGLISH - I	L	Т	Р	С
(Common to all branches of Engineering and Technology)	2	0	2	3

- Discover an understanding of the process of oral communication
- Originate knowledgeable audience-centered speaking
- Formulate a significant training ground for the development of student's abilities in public speaking
- Create multiple opportunities for students to practice and share their reading skill development
- Improve critical thinking and analytical skills
- Develop a milestone for leadership and group participation through communication skills

READING: FUNDAMENTALS OF ENGLISH

Fundamentals of English Grammar - Basics of sentence completion - Syntax- Giving facts and explaining functions and processes - Explaining concepts and ideas - Giving encouragement: phrases for positive feedback; more emphatic adjectives and adverbs - Giving, getting and checking information - Signaling the structure of a presentation – introducing, sequencing and concluding a talk - Reading a report - New technologies and change - News Paper Reading.

WRITING: BASIC STRATEGIES OF WRITING

Agreeing and disagreeing – Practice of frequency - Article Writing (Critical writing- Creative writing)- Anecdote Formation - Greeting friends and strangers - Short prepared compositions on current affairs - Writing a proposal for conducting science exhibition - Factual business letters and E-mail etiquette

LISTENING: LANGUAGE ACQUISITION

Descriptive words and regular - irregular verbs - Conversation between old friends; introducing others - Tense and voice - Establishing relationships and negotiating - Discussion on Practical business tasks- Ordering or answering enquiries - Short telephone conversations - Outline a problem and present a solution - Fluency Drills- British and American equivalents..

SPEAKING: ADEPTNESS OF ARTICULATION

Practice of phonetic transcription (Vowel and Consonant symbols) - Presenting information -General business discussions and factual discussions -Giving and getting product information -Describing organizations - Practicing of conversation starters and closers with friends and strangers - Asking about possibility/preference - Offering help - Seeking permission – Persuading - Talking about people and places - Explaining ideas and visual information

REFERENCES

L: 30 Hr, T: 30 Hr, TOTAL: 60 HOURS

15 Hours

15 Hours

15 Hours

- 1. Mark Ibbotson, Cambridge English for Engineering, Cambridge University Press, 2008.
- 2. Barbara H. Foley, Elizabeth R. Neblett, English in Action, Adult & Academic ESL, .2003.
- 3. Jeremy Comfort, Pamela Rogerson, Trish Stott and Derek Utley, Speaking Effectively, Cambridge University Press, 1994
- 4. Dorothy Adams, Everyday English: A Course on Communicative English, Cengage learning, 2009
- 5. Guy Brook Hart, BEC Vantage- Business Benchmark Upper Intermediate, 2006

- > Formulate and practice effective reading strategy to enhance technical communication
- > Assess strengths in writing skills and set goals for future growth
- Practice and perceive the full repertoire of listening strategies by using authentic listening tasks
- Create learning situations to develop speaking skills based on sound educational and communication theories.

U14MAT101/ ENGINEERING MATHEMATICS -I	L	Т	Р	С
(Common to all branches of Engineering and Technology)	3	1	0	4

On completion of the course the students are expected

- To know eigen values and eigen vectors and diagonalization of a matrix.
- To know about the geometrical aspects of curvature, evolute and envelope.
- To solve ordinary differential equations of certain types and its application. •
- To understand the concepts of partial differentiation, maxima and minima.

MATRICES

Rank of a matrix – Linearly dependent and independent vectors – Eigen values and eigenvectors of a real matrix - Properties of eigen values and eigenvectors - Cayley Hamilton theorem (excluding proof) – Orthogonal matrices – Orthogonal transformation of a symmetric matrix to diagonal form – Reduction of quadratic form to canonical form by orthogonal transformation.

GEOMETRICAL APPLICATIONS OF DIFFERENTIAL CALCULUS 9 Hours Curvature - Radius, Centre and Circle of curvature in Cartesian, Parametric and Polar form -

Evolute – Envelope of family of curves with one and two parameters – Evolute as the envelope of normals - properties of evolute and envelope.

FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS 9 Hours Leibnitz's equation - Bernoulli's equation - Equations of first order and higher degree -Clairauts form – Applications: Orthogonal trajectories and simple Electric circuit problems.

HIGHER ORDER LINEAR DIFFERENTIAL EQUATIONS 9 Hours Linear equations of second and higher order with constant coefficients - Euler's and Legendre's linear equations – Method of variation of parameters – First order Simultaneous linear equations with constant coefficients - Application - Oscillatory electrical circuit. (Differential equations and associated conditions need to be given).

FUNCTIONS OF SEVERAL VARIABLES

Total derivative - Taylor's series expansion - Maxima and minima of functions of two variables - Constrained maxima and minima: Lagrange's multiplier method with single constraints -Jacobians.

L: 45 + T: 15 = 60 Hours

REFERENCES

- 1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 40th Edition.
- 2. Veerarajan T., Engineering Mathematics (for First Year), Tata McGraw Hill Pub. Co. Ltd., New Delhi, Revised Edition, 2007.
- 3. Kandasamy P., Thilagavathy K., and Gunavathy K., "Engineering Mathematics", S. Chand & Co., New Delhi, (Reprint) 2008.
- 4. Krevzig E., "Advanced Engineering Mathematics", Eighth Edition, John Wiley and sons, 2010.
- 5. Arunachalam, T., Engineering Mathematics I, Sri Vignesh Publications, Coimbatore. (Revised) 2009.
- 6. Venkataraman M.K., "Engineering Mathematics", The National Pub. Co., Chennai, 2003.
- 7. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, (2007).

9 Hours

Course Outcome

After pursuing the above mentioned course, the students will be able to:

- Know eigen values and eigen vectors and its role in the system of equations.
- > Discover the radius, centre and circle of curvature of any curves.
- Solve the ordinary differential equations of certain types and its applications.
- > Identify the maximum and minimum values of surfaces

U14PH7101/ ENGINEERING PHYSICSLTPC(Common to all branches of Engineering and Technology)3003

OBJECTIVES

At the end of the course the students would be exposed to fundamental knowledge in

- Various engineering subjects and applications.
- Structure identification of engineering materials.
- Non-destructive techniques.
- Interferometric techniques in metrology and electrical phenomena.
- Application of lasers in engineering and technology.
- Atomic and Nuclear related theories.

CRYSTAL PHYSICS

Space lattice – unit cell – lattice planes – Bravais space lattices – Miller indices – calculation of interplanar distances – Atomic radius – co- ordination number – Packing factor for SC, BCC, FCC and HCP structures – crystal imperfections – point defects – line defects – surface defects – volume defects – effect of crystal imperfections.

APPLIED OPTICS

Interference – airwedge and its applications – Michelsons interferometer – construction, working – determination of wave length and thickness – Lasers – spontaneous and stimulated emissions – Einsteins coefficients – Nd: YAG, Co_2 and semiconductor laser – Homojunction and Hetrojunction (only qualitative description) – applications – CD-ROM and holography (qualitative only) – optical fibre – principle and propagation of light in optcal fibers – Numerical aperture and acceptance angle – types of optical fibres – applications – fibre optic communication system – medical endoscopy.

QUANTUM PHYSICS

Plancks quantum theory of black body radiation (derivation) – Photo electric effect – Compton effect (derivation) and experimental verification of Compton effect – De-broglies concept - Schrodinger wave equation – time independent and time dependent equations (derivations) – physical significance of wave function – particle in a box (one dimensional case) – Electron microscope – Scanning electron microscope – Transmission electron microscope.

ULTRASONICS AND NDT

Introduction – production – magnetostriction effect – magnetostriction generator – piezoelectric effect – piezo electric generator –properties –detection – cavitation –acoustic grating – velocity measurement – applications –Sonar –velosity of blood flow – NDT –Liquid Penetrant method – Ultrasonic flaw detector – A scan, B scan, C scan – X- ray radiography and fluoroscopy – Thermography.

9 Hours

9 Hours

9 Hours

ATOMIC AND NUCLEAR PHYSICS

9 Hours

Introduction – Atomic spectra – Molecular spectra – Applications – Raman effect – Stokes lines and anti stokes lines – Applications – Nuclear models – Liquid drop model – The Shell model-Nuclear fission – Theory – Energy released per fission – Chain reaction – Controlled chain reaction – Nuclear reactors – Condition for sustained chain reaction – Types of Nuclear reactors – Nuclear fusion – Thermo nuclear reactions – Differences between fission and fusion

TOTAL: 45 HOURS

REFERENCES

- 1. Rajendran V, Applied Physics, Tata McGraw Hill Publishing Company Limited, New Delhi, 2003.
- 2. Gopal S., Engineering Physics, Inder Publications, Coimbatore, 2006.
- 3. Palinisamy P.K., Engineering Physics I, Scitech Publications, Chennai, 2011.
- 4. Avadhanulu M.N. andKshirsagar P.G., A textbook of Engineering Physics, S.Chand & Company Ltd, New Delhi,2005.
- 5. Gaur R.K. and Gupta S.L., Engineering Physics, 8th edition, DhanpatRai Publications (P) Ltd., New Delhi, 2003.

- > Analyze and identify the crystal structure in materials
- > Categorize and illustrate the optical materials and its application to engineering
- Examine and compare samples at nano level
- > Apply the NDT techniques and modern engineering tools necessary for engineering practice.
- > Discuss the role of nulear physics in energy production

U14CH7101/ ENGINEERING CHEMISTRY	L	Т	Р	С	
(Common to all branches of Engineering and Technology)	3	0	0	3	

- To inculcate an understanding of the importance of chemistry by providing an overall perspective of theoretical and modern technological aspects of applied chemistry before beginning their more specialized courses.
- To embellish the usage of chemistry to exhibit engineering and technical concepts

ELECTROCHEMISTRY

Introduction - Electrode potential – Nernst equation and problems - Electrochemical series -Application of EMF measurements & problems - Kohlrausch law of independent migration of ions & its application - Conductometric titrations (acid - base & precipitation titration) **Electrodes :** Standard and reference electrode (Hydrogen & Calomel) – Types of electrodes (Metal – Metal ion; Metal – Metal insoluble salt, Redox electrode) - Ion selective (glass electrode) – determination of pH using glass electrode

Cells : Galvanic cell – Types of concentration cells

ENERGY STORING DEVICES

Batteries : Primary Battery (Lechlanche & Alkaline battery) - Secondary Battery (Lead acid storage battery, Nickel - Cadmium battery & Lithium – Polymer battery) – Flow battery (Hydrogen and Oxygen Fuel Cell)

Solar Cells: Hybrid Solar cells

Nuclear Reactors: Light water nuclear power plant (nuclear fission) - ICF (nuclear fusion)

THERMODYNAMICS

Introduction - Thermodynamic process (isothermic, isobaric, isochoric and adiabatic processes) -Internal energy – first law of thermodynamics (Mathematical derivation & limitation) - Enthalpy - Second law of thermodynamics - Entropy - Entropy change of an ideal gas & problems -Free energy - work function - Gibbs Helmholtz equation (derivation, applications & problems) -Van't Hoff isotherm (derivation & problems) - Van't Hoff isochore - (derivation & problems) -Third law and zeroeth law (Only statements)

SURFACE CHEMISTRY

Introduction of adsorption - Types of Adsorption - Adsorption isotherm (Freundlich isotherm, Langmuir adsorption isotherm, BET isotherm) - Applications of adsorption : Role of adsorption in catalytic reactions, Ion exchange adsorption, adsorption chromatography (Column chromatography)

9 Hours

9 Hours

9 Hours

SPECTROSCOPY

9 Hours

Introduction to spectroscopy - Beer Lambert's Law - Colorimetric analysis (principle, instrumentation (block diagram only) & application (Estimation of concentration of Ferrous and copper ions a solution by colorimetry) - UV – visible spectroscopy (principles, instrumentation (block diagram only) & simple Applications) - IR spectroscopy (principles, instrumentation (block diagram only) & simple applications) - Flame photometry (Principle, instrumentation (block diagram only) & simple Applications)

TOTAL: 45 HOURS

REFERENCE

- 1. Bahl B.S., Tuli G.D. and ArunBahl., Essential of Physical Chemistry, S.Chand& Co. Ltd., New Delhi.
- 2. Somorjai G.A., Introduction to surface chemistry and Catalysis, John Wiley & Sons Inc., New York.
- 3. Shaw D.J., Introduction to colloidal and surface Chemistry, Butterworth Heinemann Publishers
- 4. Syed Shabudeen, P.S. and Shoba U.S., Engineering Chemistry, Inder Publishers, Coimbatore.
- 5. Jain P.C. and Monika Jain, Engineering chemistry, Dhanpatrai Pub. Co. (P) Ltd., New Delhi.
- 6. Puri B.R., Sharma L.R. and Pathania M.S., Principles of Physical chemistry, ShobanLal Nagin Chand & Co., New Delhi

- Assemble a battery and illustrate the phenomenon of production of electric current
- > Discuss the thermodynamic concepts and predict the feasibility of chemical reaction
- Apply the theory of adsorption in real life situations
- > Outline the principles and instrumentation of spectroscopic techniques

- To enable students to learn about the basics of computers and problem solving methods
- To learn the various features of C
- To learn how to program using C language

INTRODUCTION

Programs and Programming- Programming languages and Their Classification - Compiler, Linker, Loader and Interpreter - Structured Programming Concept - Algorithm - Pseudo Code -Flow Chart.Number System – Binary – Decimal – Conversion Problems.

C LANGUAGE BASICS

Introduction to C Programming - Fundamentals - Structure of a C Program - Compilation And Linking Processes - Constants, Variables - Data Types - Expressions Using Operators In C -Managing Input And Output Operations - Decision Making And Branching - Looping Statements - Solving Simple Scientific And Statistical Problems.

ARRAYS AND STRINGS

Arrays - Initialization - Declaration - One Dimensional And Two Dimensional Arrays. String-String Operations - String Arrays. Simple Programs - Sorting- Searching - Matrix Operations.

FUNCTIONS, STORAGE CLASSES AND POINTERS

Functions: Definition of function – Declaration of function – Pass by value – Pass by reference – Recursion.

Storage classes – auto, static, extern, register- scope rules.

Pointers: Definition - Initialization - Pointers arithmetic - Pointers and arrays - Dynamic memory allocation - Example Problems

STRUCTURES, UNIONS AND FILES

Structures and Unions: Introduction - need for structure data type - structure definition -Structure declaration - Structure within a structure - Union - Programs using structures and Unions.

Files: Introduction – Using files in C - Working with text files.

L: 45 Hr, T: 15 Hr, TOTAL: 60 Hours

9 Hours

9 Hours

9 Hours

9 Hours

REFERENCES

- 1. Pradip Dey and Manas Ghosh, "Programming in C", Second Edition, Oxford University Press, 2011.
- 2. Rajasekaran S, "Numerical methods in Science and Engineering-A practical approach", S.Chand and Company, New Delhi-55, 2012.
- **3.** Kernighan,B.W and Ritchie,D.M, "The C Programming language", Second Edition, Pearson Education, 2006
- **4.** Byron S Gottfried and Jitendar Kumar Chhabra, "Programming with C", Tata McGraw Hill Publishing Company, Third Edition, New Delhi, 2011.
- 5. Ashok N. Kamthane, "Computer programming", Pearson Education, 2007.

COURSE OUTCOMES

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- Explain the basics of programs and programming
- > Select appropriate data types and control structures for solving a given problem.
- > Illustrate the representation of arrays, strings and usage of string operations.
- > Illustrate the importance of pointers and dynamic memory allocation.
- > Explain the basics of file handling mechanism.

U14MET101/ENGINEERING GRAPHICS	L	Т	Р	С
(Common to all branches of Engineering and Technology)	2	0	3	3

- To understand the principle of orthographic projection of points, lines, surfaces and solids.
- To understand the principle of section and development of solids.
- To understand the principle of Isometric and Perspective projections.
- To study the principle of free-hand sketching techniques.

PLANE CURVES, PROJECTION OF POINTS AND LINES **15 Hours**

Importance of graphics in design process, visualization, communication, documentation and drafting tools, Construction of curves - ellipse, parabola, and hyperbola by eccentricity method only. Orthographic projection of points.

Projections of straight lines located in first quadrant - determination of true length and true inclinations.

PROJECTIONS OF SURFACES AND SOLIDS

Projections of plane surfaces - polygonal lamina and circular lamina, located in first quadrant and inclined to one reference plane., Projection of simple solids - prism, pyramid, cylinder and cone. Drawing views when the axis of the solid is inclined to one reference plane.

SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES

Sectioning of simple solids - prisms, pyramids, cylinder and cone. Obtaining sectional views and true shape when the axis of the solid is vertical and cutting plane inclined to one reference plane.

Development of lateral surfaces of truncated prisms, pyramids, cylinders and cones.

PICTORIAL PROJECTIONS

Isometric projection, Isometric scale, Isometric views of simple solids, truncated prisms, pyramids, cylinders and cones.

Perspective projection of prisms and pyramids when its base resting on the ground by vanishing point method.

FREE-HAND SKETCHING

Free hand sketching techniques, sketching of orthographic views from given pictorial views of objects, including free-hand dimensioning.

Sketching pictorial views from given orthographic views.

L: 30 Hr, P: 45 Hr, TOTAL: 75 Hours

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15 Hours

15 Hours

15 Hours

REFERENCES

- 1. Basant Agrawal and CM Agrawal, Engineering Drawing, McGraw-Hill, New Delhi, First Edition, 2008.
- 2. Venugopal K. and Prabhu Raja V., Engineering Graphics, New Age International (P) Limited, New Delhi, 2008.
- 3. Nataraajan K.V., Engineering Drawing and Graphics, Dhanalakshmi Publisher, Chennai, 2005.
- 4. Warren J. Luzadder and Jon. M. Duff, Fundamentals of Engineering Drawing, Prentice Hall of India Pvt. Ltd., New Delhi, Eleventh Edition, 2005.
- 5. Gopalakirishna K.R., Engineering Drawing (Vol. I & II), Subhas Publications, 2001.

- Construct various plane curves and projection of lines and surfaces.
- > Develop projection of solids, sections of solids and surfaces.
- Apply the concepts of isometric, perspective and free hand sketching in engineering practice.

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U14CHP101/U14CHP201 CHEMISTRY LABORATORY	L	Т	Р	С
(Common to all branches of Engineering and Technology)	0	0	3	1

- To apply the theoretical principles and perform experiments
- Experience the importance of theory by using analytical equipments and quantitative and qualitative procedures.

LIST OF EXPERIMENTS

PREPARATION OF SOLUTIONS (STANDARD)

- 1. Preparation of normal solutions of the following substances oxalic acid, sodium carbonate, hydrochloric acid.
- 2. Preparation of phosphate buffer using Henderson equation.

WATER TESTING

- 3. Determination of total, temporary and permanent hardness by EDTA method.
- 4. Estimation of DO by Winkler's method.
- 5. Estimation of alkalinity by Indicator method.
- 6. Estimation of chloride by Argentometric method.

ELECTRO CHEMICAL ANALYSIS

- 7. Estimation of hydrochloric acid by pH metry.
- 8. Conductometric titration of mixture of acids and strong base
- 9. Conductometric precipitation titration using BaCl₂ and Na₂SO₄.
- 10. Estimation of Iron by Potentiometry

PHOTOMETRY

- 11. Estimation of the Ferrous ions (Thiocyanate method) by Spectrophotometry.
- 12. Estimation of sodium and potassium by Flame photometry.

TOTAL: 45 HOURS

REFERENCES

- 1. Jeffery G.H., Bassett J., Mendham J. and Denny R.C., Vogel's Text Book ofQuantitative Chemical Analysis, Oxford, ELBS, London, 2002.
- 2. Shoemaker D.P. and C.W. Garland., Experiments in Physical Chemistry, TataMcGraw-Hill Pub. Co., Ltd., London, 2003.
- 3. Shoba U.S., Sivahari R. and Mayildurai R., Practical Chemistry, Inder Publications, Coimbatore, 2009.

- Prepare normal solutions
- Analyse the properties of water by applying the chemical concepts

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Estimate the concentration of solutions by electrochemical methods and apply it in real life situations like blood testing etc

U14PHP101/U14PHP201 PHYSICS LABORATORY	L	Т	Р	С
(Common to all branches of Engineering and Technology)	0	0	3	1

OBJECTIVES

- The experiments are designed to illustrate phenomena in different areas of Physics and to expose you to measuring instruments.
- The laboratory provides a unique opportunity to validate physical theories in a quantitative manner.
- Laboratory experience demonstrates the limitations in the application of physical theories to real physical situations.
- In general, the purpose of these laboratory exercises is both to demonstrate some physical principle and to teach techniques of careful measurement

LIST OF EXPERIMENTS

Any Ten Experiments

- 1. Lee's disc determination of thermal conductivity of a bad conductor
- 2. Air wedge determination of thickness of agiven specimen.
- 3. Spectrometer determination of wavelength of mercury source using grating
- 4. Compound pendulum determination of accelaration due to gravity.
- 5. Carey foster bridge determination of specific resistance of given coil of wire.
- 6. Viscosity determination of co-efficient of viscosity of a liquid by poiseuille's flow method.
- 7. Non-uniform bending determination of Young's modulus
- 8. Ultrasonic interferometer –determination of velocity of sound and compressibility of liquid.
- 9. Band gap determination of a semiconductor using post office box
- 10. Semiconductor laser:
 - a. Determination of wavelength of laser using grating
 - b. Particle size determination
 - c. Acceptance angle of optical fibre
- 11. Torsional pendulum determination of Rigidity modulus of the wire
- 12. Field along the axis of a coil Determination of magnetic moment.

Demonstration experiments:

- 1. Determination of solar cell parameters
- 2. Hall effect
- 3. Four probe apparatus
- 4. Animations –(Laser, Fiber optics and hysteresis curve)

TOTAL: 45 HOURS

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COURSE OUTCOMES

- Determine different physical properties of a material like the thermal conductivity thickness of the material, etc.
- > Perform experiments involving the physical phenomena like interference and diffraction.
- > Apply physical theories in real life situations by also taking into account its limitations

U14CSP101/ STRUCTURED PROGRAMMING	L	Т	Р	С
LABORATORY USING C	0	0	3	1
(Common to all branches of Engineering and Technology)	U	v	5	-

OBJECTIVES

- To enable students to solve problems using C
- To apply the various features of C

LIST OF EXPERIMENTS

- 1. Simple programs
 - To find whether the given number is prime or not
 - Factorial of the given number
- 2. Programs involving Control and Looping Structures
 - Arithmetic Progression
 - Trigonometric series evaluation
- 3. Programs using Arrays
 - Sorting
 - Matrix addition and Multiplication
- 4. Calculation of median of a frequency distribution.
- 5. Evaluation of integrals
 - Trapezoidal Rule
- 6. String Processing
- 7. Program using Recursive function
- 8. Using pointers in C
- 9. Program using Functions, Structures and Files
 - Students Mark Analysis
- 10. Iterative method for finding Roots of the polynomials
 - Lagrange interpolation method

TOTAL: 45 HOURS

- > Develop algorithms, flowcharts and programs to solve a given problem.
- > Demonstrate code reusability using recursive and non-recursive functions.
- > Implement pointers, memory allocation techniques and files in 'C' language.
- > Apply and practice logical ability to solve simple problems.
- > Demonstrate 'C' programs for statistical and scientific problem solving.

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LIST OF EXPERIMENTS

GROUP – I A. CIVIL ENGINEERING 1. Carpentry

- Study of carpentry tools
- Preparation of T joint
- Preparation of dovetail joint

2. Plumbing

Study of pipeline joints •

B. MECHANICAL ENGINEERING

1. Fitting

- Study of fitting tools
- Preparation of L joint
- Preparation of square joint

2. Sheet Metal Working

- Study of sheet metal working tools
- Preparation of cone and tray

3. Welding

- Study of arc welding tools and equipment
- Preparation of butt joint

GROUP - II (ELECTRICAL & ELECTRONICS ENGINEERING) C. ELECTRICAL ENGINEERING PRACTICE

12 Hours

- Basic household wiring using switches, fuse, indicator-lamp, etc.,
- Preparation of wiring diagrams.
- Stair case light wiring.
- Tube light wiring
- Study of iron-box, fan with regulator, emergency lamp and microwave oven.

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D. ELECTRONIC ENGINEERING PRACTICE

- 1. Assembling simple electronic component on a small PCB and Testing.
- 2. Soldering simple electronic circuits and checking continuity.
- 3. Measurements using digital multimeter.
 - DC and AC voltage measurement
 - DC and AC current measurements.
 - Resistance Measurement.
 - Continuity measurement.
- 4. Testing of Electronic components
 - Resistors
 - Inductors and capacitors
 - Diodes (resistance in forward bias and reverse bias)
 - Transistors
- 5. Study of CRO and Function generator
 - Study of Panel Controls
 - Measurement of Amplitude, Frequency, phase difference

TOTAL: 45 HOURS

COURSE OUTCOMES

- > Select the various tools and equipments used in the fabrication workshop.
- > Develop various models in carpentry, fitting, sheet metal work and welding.
- Demonstrate and evaluate the parameters of basic electronic components (wires, resistors, capacitors, diodes etc.) and test the components.
- Estimate DC and AC Voltage and currents using appropriate measuring instruments.

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U14GHP101/ PERSONAL VALUES Т Р L (Common to all branches of Engineering and Technology) 1 0 1

OBJECTIVE

- To inspire students to become best Humans.
- To know about self.
- To overcome evil temperaments.
- To live with sound health.
- To reach Intuition

HUMAN LIFE & EXCELLENCE

Human Excellence: Introduction - objective - personal values - importance. : Self – Society – Nature – Yoga – purpose of life – philosophy of Human life. Life Body, Soul, Mind & Their Functional Relationship : Panchboothas and it's association -Form of the body : physical body, astral body, causal body - Effect: Pain, Disease, Death; Soul – Life force – Bio magnetism – Genetic Centre – Mind : Origin & it's ten stages.

INTROSPECTION & THOUGHT ANALYSIS

Introduction – Importance – Blemishes – Six evil temperaments & their maneuvering. **Thought analysis:** Introduction - process of thought – Mind & Thought relationship – causes for origin of thoughts

Exercise: Training & Practice of Thought analysis

MORALIZATION OF DESIRE

Desire : Introduction - Causes - Types - Contra qualities evolving out of desire - Effect of unfulfilled desire – Renunciation – Is attainment of desire in harmony with Law of Nature. Training : Moralization of Desire.

NEUTRALIZATION OF ANGER

Introduction - Origin of Anger - Alternative forms of Anger - A chain action - Consequence of anger on self & others – Neutralization of anger – the point where anger is won. **Training** : Neutralizing anger.

ERADICATION OF WORRIES

Worry: Causes - Effects – Types of problems – Solution to problems – Overcoming Worries. Training – Eradication of Worries.

REALIZATION OF SELF

Transformation Theory – Understating Self – Guru's role in guiding – Who am I? – Shaping One's destiny.

The

2 Hours

2 Hours

4 Hours

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1

4 Hours

2 Hours

38

Training : Realization of self.

THEORY & PRACTICAL SESSION ON PHYSICAL EXERCISE:9 HoursIntroduction – Hints & caution – Live in Health and harmony – Hand Exercise – LegExercise – Neuro muscular breathing Exercise – Kapalapathy – Magarasanas I & II –Massage – Acu-pressure – Body relaxation .

MEDITATION

Meditation: Agna Meditation – Shanthi Meditation.

5 Hours

Total: 30 Hours

- > Acquire knowledge on the individual in relation to Nature and Society.
- > Analysis purity of Thoughts, Moralization of Desire
- Learn about Neutralization of Anger.
- Develop skills in Sky yoga and Kaya kalpa.

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SEMESTER II

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U14EN7201/ FUNCTIONAL ENGLISH - II	L	Т	Р	С
(Common to all branches of Engineering and Technology)	2	0	2	3

- To develop reading accuracy and English fluency
- To Employ appropriate formats in writing and effective
- To compare and relate words/sounds and listen for specific information.
- To maximize the elements of spoken ability

INTERPRETATIONAL DEXTERITY

Homophones and homonyms - Encoding and decoding advertisements - Transcoding Graphical Representations – Line graph, Bar Chart, Flow Chart, Pie Chart, Table, Tree diagram - Reading brochures, leaflets, instruction manual - Cloze test - Reading Comprehension- Note Making – Linear and non-linear - Book review, Article review

STYLES OF SCRIPTING

Types of sentences - Concord - Framing Questions – "Wh" questions, Yes/No questions and Question Tags- Modifiers – Dangling, Misplaced, Squinting- Phrasal Expressions- Editing a passage – Punctuation, Spelling, and Common errors - Paragraph Writing – Narrative, Descriptive, Argumentative, Comparative / Contrastive. - Letter Writing – requesting information, explaining a situation, letter of acceptance, declining letter, letter of application and resume - Essay Writing

AUDITORY PROFICIENCY

Listening to monologues, Listening for general content - Listening to dialogues - Listening to a telephonic conversation - Listening for specific information, numbers, time, duration - Listening to conversations between three or more people- Listening to a group discussion and providing factual information, Intensive listening

ORATORICAL EFFICIENCY

Discussing studies/interests/friends/families-Describe an object or event - Describing a working mechanism - Justify an opinion / Negotiating views - Argumentative speech about a public issue - Responding to situations and providing solutions - Picture Perception

L: 30 Hr, P: 30 Hr, TOTAL: 60 HOURS

REFERENCES

- 1. Mark Ibbotson, Cambridge English for Engineering Published by Cambridge University Press, 2008.
- 2. Barbara H. Foley, Elizabeth R. Neblett, English in Action, Adult & Academic ESL, 2003
- 3. Jeremy Comfort, Pamela Rogerson, Trish Stott and Derek Utley, Speaking Effectively, Cambridge University Press, 1994
- 4. Henry I Christ, English for the College Boards, Amsco. 1987



15 Hours

15 Hours

15 Hours

15 Hours

42

5. Dorothy Adams, Everyday English: A Course on Communicative English, Cengage learning, 2009

- > Distinguish the application of technical diction for the data interpretation while reading
- Construct technical sentences and compose corporate letters
- > Improve listening for inferring technical information
- Develop spoken communication needed for presentations and discussions

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U14MA7201/ ENGINEERING MATHEMATICS - II	L	Т	Р	С
(Common to all branches of Engineering and Technology)	3	1	0	4

On completion of the course, the students are expected

- To understand double and triple integrations and enable them to find area and volume using multiple integrals.
- To know the basics of vector calculus comprising gradient, divergence and curl and line, surface and volume integrals.
- To understand analytic functions of complex variables and conformal mappings.
- To know the basics of residues, complex integration and contour integration.
- To understand Laplace transform and use it to represent system dynamic models and evaluate their time responses.

MULTIPLE INTEGRALS

Double integration – Cartesian and polar coordinates – Change of order of integration – Change of variables between cartesian and polar coordinates - Triple integration in cartesian coordinates – Application : Area as double integral – Volume as triple integral .

VECTOR CALCULUS

Gradient, divergence and curl – Directional derivative – Irrotational and solenoidal vector fields - Green's theorem in a plane, Gauss divergence theorem and Stoke's theorem (excluding proofs) – Simple applications involving cubes and rectangular parallelopipeds.

ANALYTIC FUNCTION

Functions of a complex variable – Analytic functions – Necessary conditions, Cauchy-Riemann equations in Cartesian coordinates and sufficient conditions (excluding proofs) – Properties of analytic function – Construction of analytic function by Milne Thomson method – Conformal mapping : w = z + c, cz, 1/z and bilinear transformation.

COMPLEX INTEGRATION

Statement and applications of Cauchy's integral theorem and Cauchy's integral formula (excluding proofs) – Taylor's and Laurent's series expansions – Singularities – Residues – Cauchy's residue theorem (excluding proof) – Application of residue theorem to evaluate real integrals - Unit circle and semi-circular contours (excluding poles on real axis).

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9 Hours

9 Hours

9 Hours

LAPLACE TRANSFORM

9 Hours

Definition - Properties – Superposition - Shift in t - Shift in s - Time Derivatives - Time Integral – Initial and Final Value Theorems – Periodic functions: sine wave, saw-tooth, square and triangular waves - Inverse Laplace Transform – Simple system dynamic models – Transfer Functions – Poles and Zeroes - Response of First-Order Systems - Solution of RC Free, Step and Sinusoidal Responses; Response of Second-Order Systems - Free Response, step Response - Convolution theorem.

L: 45 + T: 15 = 60

REFERENCES

- 1. Grewal B.S., Higher Engineering Mathematics, Khanna Publishers, Delhi, 42nd Edition, 2012. (for Units I to IV).
- Philip D. Cha, James J. Rosenberg, Clive L. Dym, Fundamentals of Modelling and Analyzing Engineering Systems, Cambridge University Press, United Kingdom, 2000. (for Unit – V)
- 3. Kreyzig E., Advanced Engineering Mathematics, John Wiley & Sons (Asia), Pvt, Ltd.,
- 4. Singapore, 10th Edition, 2010.
- 5. Veerarajan T., Engineering Mathematics (for First Year), Tata McGraw Hill, Pub. Co. Ltd., New Delhi, Revised Edition, 2007.
- 6. Venkataraman M.K., Engineering Mathematics, Volume II, The National Pub. Co., Chennai, 2003.
- 7. Kandasamy P., Thilagavathy K. and Gunavathy K., Engineering Mathematics, S. Chand & Co., New Delhi, 2008.
- 8. Arunachalam T. and Sumathi K., Engineering Mathematics II, Sri Vignesh Publications, Coimbatore, Third Edition, 2011.

Course Outcomes

After pursuing the above mentioned course, the students will be able to:

- Evaluate double integral and triple integral to compute area, volume for two dimensional and three dimensional solid structure.
- Know the gradient, divergence and curl, related theorems useful for engineering applications.
- Test the analyticity and to construct the analytic function and transform complex functions from one plane to another plane graphically.
- > Evaluate real and complex integrals over suitable closed paths or contours.
- Know the Applications of Laplace transform and its properties & to solve certain linear differential equations using Laplace transform technique.

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U14PH7204 / APPLIED PHYSICS	L	Т	Р	С
(Common to Textile Technology and Fashion Technology)	3	0	0	3

At the end of the course the students would be exposed to

- Properties of conducting, super conducting, magnetic and dielectric materials.
- Properties of Semi conducting, optical and new engineering materials.
- Application of ultrasonic and nuclear physics in medicine.

CONDUCTING AND SUPERCONDUCTING MATERIALS 9 Hours

Conducting Materials : Classical free electron theory of metals-Electrical conductivity – Thermal conductivity – expression – Wiedemann Franz law(derivation) – Lorentz number – drawbacks of classical theory – Fermi distribution function – density of energy states – effect of temperature on Fermi energy.

Superconducting Materials : Superconducting phenomena – properties of superconductors – Meissner effect, Isotope effect, Type I &Type II superconductors – High Tc superconductors - Applications – cryotron, magnetic levitation and squids.

SEMICONDUCTING MATERIALS

Origin of band gap in solids (Qualitative treatment only) - Concept of effective mass of an electron and hole – carrier concentration in an intrinsic semi conductor (derivation) – Fermi level – variation of Fermi level with temperature - Electrical conductivity – band gap semiconductor – carrier concentration in n-type and p-type semi conductors (derivation) – Variation of Fermi level with temperature and impurity concentration – Hall effect – Determination of Hall coefficient – experimental set up – Applications.

MAGNETIC & DIELECTRIC MATERIALS

Magnetic Materials : Properties of dia, para, ferro, anti ferro and ferri magnetic materials -Langevin's theory of paramagnetism – Weiss theory of Ferromagnetism – Domain theory of ferromagnetism - hysteresis – soft and hard magnetic materials – Ferrites – Applications magnetic recording and readout - Storage of magnetic data, Tapes, floppy, magnetic disc drives – Bubble memory.

Dielectric Materials : Electronic, ionic, orientation and space charge polarization -Frequency and temperature dependence of polarization – Dielectric loss – Dielectric breakdown – different types of break down mechanism - Ferro electric materials - properties and applications.

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9 Hours

9 Hours

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NEW ENGINEERING MATERIALS

9 Hours

9 Hours

Metallic glasses – preparation, properties and applications – shape memory alloys (SMA) – characteristics, properties of NiTi alloy applications advantages and disadvantages of SMA . Ceramics-Classification of ceramics- Fabrication, Properties and application. Biomaterials-Biomechanisim - Classification of Biomaterials-Processing, Properties and applications.

NANO SCIENCE AND PLASMA TECHNOLOGY

Nano Materials : synthesis - plasma arcing – Chemical vapour deposition – sol-gel - Electro deposition – ball milling – properties of nanoparicles and applications. – Carbon nano tubes – fabrication - arc method – pulsed laser deposition - Chemical vapour deposition - structure, properties & applications.

Plasma Technology: properties of plasma- types of plasma- thermal and non thermal plasma-Production of glow discharge plasma-Cold plasma- applications in textile and biomedical field.

TOTAL: 45 HOURS

REFERENCES

- 1. Gopal S., Materials Science, Inder Pub., Coimbatore, 2007.
- 2. Pillai S.O., Solid State Physics, 5th edition, New Age International Pub., New Delhi, 2003.
- 3. Avadhanalu M.N. and Kshirsagar P.G., A textbook of Engineering Physics, S. Chand & Company Ltd., New Delhi, 2005
- 4. Rajendran V. and Marikani A., Materials Science, Tata McGraw Hill Pub. Company Ltd., New Delhi, 2004
- 5. Goldston R.J. and Rutherford P.H., Introduction of Plasma Physics-I, CRC Pub., New York, America, 2000

- > Apply core concepts in Materials Science to solve engineering problems
- Illustrate the electrical / thermal conductivity of semiconductors and determine the position of the acceptor or donor levels and the brand gap of an extrinsic semiconductor,
- Classify & differentiate the structure and physical properties of conducting materials
- Apply the concepts of nanomaterials and modern materials for explaining surface properties like adhesion etc. in engineering practice.
- Identify methods for etching of fabrics

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U14CH7204 / CHEMISTRY FOR TEXTILES		Τ	Р	С
(Common to Textile Technology and Fashion Technology)	3	0	0	3

- To correlate theoretical principles with application oriented studies
- To embark on the usage of theoretical and modern technological aspects in polymers and dyes to exhibit engineering and technical concepts as required for Textile and Fashion Technology students.

WATER TECHNOLOGY

Disadvantages of hard water in textile industries - Conditioning methods : external treatment (Ion exchange method), internal treatment (colloidal, phosphate, calgon & carbonate methods) - desalination (reverse osmosis and electro-dialysis) - Common effluent treatment.

POLYMERS

Introduction – Degree of polymerization – functionality – tacticity - classification based on source, application, thermal properties (thermosetting and thermoplastics) - effect of polymer structure on properties - types of polymerization (addition, condensation, co-polymerization, Ring polymerisation) - mechanism of polymerization (free radical mechanism)

Preparation (mechanism not required) and applications of polythene, polypropylene, polystyrene, polyamides (nylon 6.6), polyesters (PET)

CHEMICAL BONDING

Ionic, covalent and co-ordinate covalent bonds (overview only) -- hydrogen bonding and its consequences - van der Waal's forces (dipole - dipole, dipole - induced dipole, induced dipole - induced dipole interactions) - Interaction of enzymes with fibres (basic concepts only). Interaction between fibers and dyes (basic concepts only) - Dyes substrate affinity (dyes for cellulose fibres, silk)

DYES

Introduction - Classification system of dyes - Chromophore and auxochromes - Important chemical chromophores of dyes classes (azo, anthraquinone, phthalocyanin, Indigoid, polymethine, phthalocyanine, metal complex, Fluorescent) - synthesis of azo dye (Congo red), triaryl methane dye (Malachite green), Anthraquinone dye (Alizarin - 1,2 dihydroxy anthraquinone), Indigoid dye (Indigo), phthalein dyes (Eosin)

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9 Hours

9 Hours

ANTHOLOGY OF SPECIALITY CHEMICALS IN TEXTILES

9 Hours

An introduction on chemistry of the following in textiles: Dispersing agents, levelling agents, Retarding agents, Dye fixing agents.

Thermal analysis (DSC): Principle, Instrumentation and application in Textiles

TOTAL: 45 HOURS

REFERENCES

- 1. Finar I.L, Organic chemistry, Pub. House, UK.
- 2. Hungar K., Industrial Dyes Chemistry, properties and applications, Wiley VCH Verlag GmbH & Co., KGaA, Weinheim.
- 3. Sivaramakrishnan C.N., Anthology of speciality chemicals for textiles, Colour Pub. (P) Ltd., Mumbai, India.
- 4. Seymour R.B. and Carraher, Polymer chemistry, Plenum Pub. Corporation, New York.
- 5. Kuriacose J.C. and Rajaram J., Chemistry in Engineering and Technology, Vol. 1 & 2, Tata McGraw-Hill Pub. Co., Ltd., New Delhi.
- 6. Syed Shabudeen P.S. and Shoba U.S., Chemistry for textiles, Inder Pub., Coimbatore.
- 7. Amarika Singh, *Vairam S. and* Suba Ramesh., Chemistry for engineers., Wiley India Ltd., New Delhi
- 8. Bahl B.S. and Arun Bahl., A Textbook Of Organic Chemistry, S. Chand & Co., New Delhi
- 9. Hungar K., Industrial Dyes Chemistry, properties and applications, John Wiley & Sons

- Design a water purifier
- Discuss the mechanism of polymer formation
- > Classify dyes and describe its interaction with fibers using bonding.
- > Analyse the usage of specialty chemicals in dyes

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U14FT7201/ FIBRE SCIENCE AND YARN TECHNOLOGY	L	Т	Р	С
(For Fashion Technology)	3	0	0	3

- To acquire knowledge on properties of texile fibres and their manufacturing methods
- To impart knowledge on the conventional and modern yarn manufacturing process

TEXTILE FIBRES

Introduction: Definition of staple fibre, filament, bicomponent fibres. Classification of natural and man-made fibres, essential and desirable properties of fibres.

Production and cultivation of Natural Fibers: Cultivation of cotton, production of silk (sericulture), wool and jute – physical and chemical structure of these fibres.

Production sequence of modified cellulosic fibres: Viscose Rayon, Acetate Rayon, high wet modulus and high tenacity fibres. Physical and chemical properties of the above fibres.

PRODUCTION SEQUENCE AND PHYSICAL AND CHEMICAL PROPERTIES OF SYNTHETIC FIBERS 9 Hours

Polyester, Nylon and Acrylic. Introduction to spin finishes and texturisation.

Speciality fibres: High temperature and flame retardant fibres, elastomeric fibres, Polylactic Acid (PLA) fibre, nano-fibres, metallic fibres-Gold and Silver coated, superabsorbent fibres for medical and hygiene applications.

SHORT STAPLE SPINNING SYSTEM (COTTON)

Sequence of process in cotton spinning - Ginning-objectives, types, suitability and principle of working; objectives and principles of working of Blow room, Carding, Drawing, Combing, Simplex and spinning machines -Ring spinning and Ringless-Rotor spinning, Air jet spinning and DREF spinning machines.

LONG STAPLE SPINNING SYSTEM

Sequence of process in woolen and worsted spinning; objectives and principles of Scouring, Drying, Oiling, Dyeing, Blending, Carding, Gilling and Combing, Roving and Spinning -Siro, Solo and Compact spinning systems.

POST SPINNING

Objectives and principles of working of Reeling, Assembly winder, Ring doubler and Two for one twister (TFO); Single yarn and ply yarn characteristics and their applications. Sewing threads. Package faults (Cones, Cheese and Hanks) and identification.

TOTAL: 45 HOURS

REFERENCES

- 1. Morton W.E. and Hearle J.W.S., Physical Properties of Textile Fibres, The Textile Institute, Manchester, U.K., 1993.
- 2. Mukhopadhyay S.K., Advances in Fibre Science, The Textile Institute, U.K., 1992.
- 3. Gupta V.B., Textile Fibres: Developments and Innovations, Vol. 2, Progress in Textiles: Science and Technology, Edited by V.K. Kothari, IAFL Pub., 2000.



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9 Hours

9 Hours

9 Hours

- 4. Oxtoby E., Spun Yarn Technology, Butterworth & Co., London, 1991.
- 5. Chellamani K.P. and Chattopadhyay D., Yarns and Technical Textiles, SITRA Pub., 1st edition, 1999.
- 6. Corbman B.P., Textiles: Fibre to Fabric, McGraw Hill int. edition, 1983.
- 7. Mishra S.P., Fibre Science and Technology, New Age Int. Pub., 2000
- 8. Klien W.G., The Technology of Short Staple Spinning, Vol. 1-5, The Textile Institute, Manchester, 1988
- 9. Mahendra Gowda, R.V., New Spinning Systems, NCUTE Pub., 2nd edition, 2006

- Acquire knowledge on the basic forms of textiles namely fibres, their classification and properties, and on the cultivation/production of natural fibres as well as modified fibres from natural raw materials.
- Outline the production of synthetic fibres, and acquire knowledge on their physical and chemical properties as well as their applications.
- Outline sequentially the processes involved in spinning cotton and worsted yarns, and describe the working of various machines used, from fibre preparation to yarn spinning

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U14FT7202 / WEAVING TECHNOLOGY	L	Т	Р	С	
(For Fashion Technology)	3	0	0	3	

- Acquire knowledge in weaving preparatory process
- Develop skills in basic principles of working of shuttle and shuttleless loom mechanisms
- Understand the process of weaving and controlling quality

YARN PREPARATION FOR WEAVING

Process Flow - objectives of winding; principles of cheese and cone winding Machines; concepts in varn clearing – mechanical, optical and electronic clearers; knotters and splicers; Yarn quality requirements for weaving.

BEAM PREPARATION FOR WEAVING

Objectives of warping, material flow in beam warping and creels used in warping machines; sectional warping machines.

objectives of sizing; sizing materials and recipes used for different types of fibers; sizing machines; control systems used in sizing machine; sizing filament yarns; concept of single end sizing

SHUTTLE WEAVING

Objectives and working principles – primary, secondary and auxiliary motions; Types of looms - Handloom, Non-automatic, Semi-automatic and Automatic looms; Drop box looms; Terry loom, mechanisms of Tappet, Dobby and Jacquard weaving.

SHUTTLELESS WEAVING

Basic principles of various shuttleless weaving machines - Projectile, Rapier, Air-jet, Waterjet, Multi-phase; productivity and techno-economics of these machines.

PROCESS CONTROL IN WEAVING

Process and quality control measures in pirn winding, cone winding, beam warping, sectional warping, sizing, and weaving. Computerised fabric inspection, Loom data system.

TOTAL: 45HOURS

REFERENCES

- 1. Allan Ormerod, Walter S. Sondhelm, Weaving-Technology and Operations, Textile Institute Pub., 1995.
- 2. Lord P.R. and Mohammed, Weaving: Conversion of yarn to fabric, M.H. Merrow Pub. Co Ltd., U.K., 1998.
- 3. Talukdar, Introduction to winding and warping, Mahajan Pub. (P) Ltd., 1998.
- 4. Talukdar, Wadekar and Ajgaonkar, Sizing–Materials, methods and machines, 2nd edition,



9 Hours

9 Hours

9 Hours

9 Hours

9 Hours

52

Mahajan Pub. (P) Ltd., 1998.

- 5. Gokarneshan N., Weaving Preparation Technology, Abhishek Pub., 2009
- 6. Talukdar, Sriramulu and Ajgaonkar, Weaving-Machines, Mechanisms, Management, Mahajan Pub. (P) Ltd., 1998

- > Outline the objectives and working principles of various weaving preparatory processes.
- Describe the working principle of automatic and non automatic looms used for fabric manufacture.
- Acquire knowledge on the process and quality control in the preparatory processes as well as in weaving.

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U14PHP101/U14PHP201 PHYSICS LABORATORY	L	Т	Р	С
(Common to all branches of Engineering and Technology)	0	0	3	1

- The experiments are designed to illustrate phenomena in different areas of Physics and to expose you to measuring instruments.
- The laboratory provides a unique opportunity to validate physical theories in a quantitative manner.
- Laboratory experience demonstrates the limitations in the application of physical theories to real physical situations.
- In general, the purpose of these laboratory exercises is both to demonstrate some physical principle and to teach techniques of careful measurement

LIST OF EXPERIMENTS

Any Ten Experiments

- 1. Lee's disc determination of thermal conductivity of a bad conductor
- 2. Air wedge determination of thickness of agiven specimen.
- 3. Spectrometer determination of wavelength of mercury source using grating
- 4. Compound pendulum determination of accelaration due to gravity.
- 5. Carey foster bridge determination of specific resistance of given coil of wire.
- 6. Viscosity determination of co-efficient of viscosity of a liquid by poiseuille's flow method.
- 7. Non-uniform bending determination of Young's modulus
- 8. Ultrasonic interferometer –determination of velocity of sound and compressibility of liquid.
- 9. Band gap determination of a semiconductor using post office box
- 10. Semiconductor laser:
 - a. Determination of wavelength of laser using grating
 - b. Particle size determination
 - c. Acceptance angle of optical fibre
- 11. Torsional pendulum determination of Rigidity modulus of the wire
- 12. Field along the axis of a coil Determination of magnetic moment.

Demonstration experiments:

- 1. Determination of solar cell parameters
- 2. Hall effect
- 3. Four probe apparatus
- 4. Animations –(Laser, Fiber optics and hysteresis curve)

TOTAL: 45 HOURS

- Determine different physical properties of a material like the thermal conductivity thickness of the material, etc.
- > Perform experiments involving the physical phenomena like interference and diffraction.
- > Apply physical theories in real life situations by also taking into account its limitations

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L	Т	Р	С
0	0	3	1

(For Fashion Technology)

LIST OF EXPERIMENTS

- 1. Study of longitudinal and cross sectional view of natural and synthetic fibres
- 2. Identification of fibres through flammability test.
- 3. Identification of fibres through solubility test.
- 4. Determination of moisture regain of fibres
- 5. Determination of blend proportions of blends
- 6. Study of blow room
- 7. Study of carding
- 8. Study of Draw frame
- 9. Study of comber and simplex
- 10. Study of ring frame and Open end spinning.
- 11. Study of non automatic and automatic looms
- 12. Study of knitting machines

TOTAL: 45 HOURS

- > Ability to identify the given fibre by choosing proper scientific method
- > Knowledge of production process methods of yarn and woven and knit fabric
- Acquire Skill to determine the blend proportion

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U14CSP211/ COMPUTING LABORATORY	L	Т	Р	С
Common to AE,BIO,CE,EIE,FT,ME,MCE,TXT	0	0	3	1

- To analyze webpage and identify its elements and attributes
- Learn the basic language of the web: HTML.
- Be able to embed social media content into web pages.
- Implement and understand how to get used with MATLAB

List of Experiments

- 1. Study of HTML tags
- 2. Design a web page using basic html tags
- 3. Design a webpage using table tags
- 4. Design a webpage using forms and frames
- 5. Design a webpage using list tags
- 6. Develop a website of your interest(include a minimum of 3 web pages)
- 7. Study of MATLAB functions
- 8. Working with matrix operations
- 9. Working with image arithmetic
 - a. Addition of two images
 - b. Subtraction of two images
- 10. Write a Matlab program for the following
 - a. Read an image and crop
 - b. Read an image and resize
- 11. Working with Integration and Differentiation
- 12. Working with graphs

COURSE OUTCOMES

On successful completion of this course the student should be able to

- 1. Develop static web pages using HTML. [S]
- 2. Perform basic MATLAB operations. [S]
- 3. Make use of MATLAB to work with images and graphs. [S]
- 4. Perform integration and differentiation using MATLAB. [S]
- 5. Develop team spirit and professional attitude towards the development of simple web applications [A]

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U14GHP201/ FAMILY&PROFESSIONAL VALUES	L	Τ	Р	С
(Common to all branches of Engineering and Technology)	1	0	1	1

- To inculcate the basic need for family life and need to maintain peace in it.
- To lead spiritual development through good family life.
- To know the 5C's & 5E's.
- To know the examples for Self Control.
- To practice meditation & Pranayamam.

PEACE IN FAMILY

Family value: Meaning – Introduction – Essential family values – Greatness of friendship -Family members and their responsibility – Reason for misunderstanding in the family – Individual & family peace – Peace of mind – Vital behavioral requisites.

Greatness of womanhood: Good culture - Cultured behavioral patterns - Love and Compassion.

BLESSING – EFFECTS IN FAMILY

Introduction - Benefits - Mental Frequency level - Effect of vibrations - Make blessings a daily habit.

Training: Method of blessings.

FOOD IS MEDICINE

Food is medicine - Healthy food habits- Method of Medicinal food preparations - Food based on character.

PERSONALITY DEVELOPMENT CONCEPTS - 5C'S & 5E'S 4 Hours

Personality Concepts: Definition - Types of Personality- Personality development activities-Factors affecting personality development - Tools to improve personality- Steps to a dynamic personality-5 C's and 5 E's.

Time Management: Importance – Training.

LEADERSHIP TRAITS & SELF DEVELOPMENT

Leadership Traits – Carrying oneself - Factors of leadership – Principles of leadership.

Self Development: Importance – Techniques to development oneself– How to develop oneself?-Ten Commandments of self-development- Self-control technique for teenagers.

Training: Method of Self-Control.

SPIRITUAL DEVELOPMENT THROUGH KAYA KALPA YOGA 4 Hours

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2 Hours

4 Hours

2 Hours

Spiritual development: Need – Development through Kaya Kalpa - Responsibility of men and women – Need of morality.

KayaKalpa yoga: Aim - kayakalpa philosophy - Importance of kayakalpa training.

Training: Kaya Kalpa Yoga.

EXERCISE & MEDITATION

10 Hours

Simplified Physical Exercise & Meditation Practice.

L: 16 Hr, P: 14, Total: 30 Hours

REFERENCES BOOKS:

- 1. Dr. A. Chandra Mohan, "*Leadership and Management*", Himalaya Publication House,
- 2. Robert W. Bly, "Make Every Second Count", Career Press, Incorporated, 2010.
- 3. Vethathiri's Maharishi's, *"Manavalakalai part 1,2&3"* 11th edition, The World Community Service Centre, Vethathiri Publications,1994.
- Vethathiri Maharishi's, "*Rejuvenating Life Force and Mind*" paper-III for M.A. Yoga for Human Excellence" 3rd edition, The World Community Service Centre, Vethathiri Publications, 2010.
- 5. Vethathiri's Maharishi's, "Yoga for Modern Age", The World Community Service Centre, Vethathiri Publications, 2009.
- 6. Vethathiri's Maharishi's, "*Genetic Centre*", The World Community Service Centre, Vethathiri Publications, 2003.
- 7. Swami Vivekananda, "*Selections from the complete works*" 23th edition , The Ramakirshna Mission Institute of Culture, 2007
- 8. Vethathiri's Maharishi's, "*Mind*" The World Community Service Centre, Vethathiri Publications, 1999.
- 9. Vethathiri's Maharishi's, *"Kudumpa Amaithi"* The World Community Service Centre, Vethathiri Publications, 2001.
- 10. Russell Kelfer, "Self Control", Tyndale House Publishers, 1985.
- 11. Swami Vivekananda, "*Karma Yoga*" 39th edition, The Ramakirshna Mission Institute of Culture, 2008.

- Behaves as a responsible family member.
- Develop skills for personality improvement.
- Acquire practical knowledge on self-control technique for teenagers.
- Identify the significant of Genetic Centre for the Soul functional base operation.

Flor

SEMESTER III

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L	Τ	Р	С
3	1	0	4

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Compute measures of central tendencies, dispersions and correlate the variables.
- **CO2:** Analyze random or unpredictable experiments and investigate important features of random experiments.
- **CO3:** Construct probabilistic models for observed phenomena through distributions which play an important role in many engineering applications.
- **CO4:** Analyze sample data and interpret the same for population.
- **CO5:** Sketch the control charts and outline the process capability.

Pre Requisite: NIL

	CO/PO Mapping											
(S/M/V	S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs	Programme Outcomes(POs)											
	PO	PO	РО	PO								
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S				W							
CO2	S	Μ										
CO3	М											
CO4		Μ		Μ								
CO5	М				W							

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course –End Survey
Tutorial	
End Semester Exam	

STATISTICAL MEASURES

5 Hours

Measures of central tendency: Mean, Median and Mode – Measures of variation: Range, Mean deviation, standard deviation and coefficient of variation.

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CORRELATION AND REGRESSION

Karl Pearson's coefficient of correlation – Spearman's Rank Correlation – Regression lines.

PROBABILITY AND RANDOM VARIABLE

Axioms of probability - Conditional probability - Total probability - Baye's theorem - Random variable - Distribution function - properties - Probability mass function - Probability density function - moments and moment generating function - properties.

STANDARD DISTRIBUTIONS

Binomial, Poisson and Normal distributions – Moments, Moment Generating functions and properties for the above distributions - Fitting of Binomial, Poisson and Normal distributions.

TESTING OF HY1POTHESIS

Testing of hypothesis for large samples (single mean, difference of means, single proportion, difference of proportions) – Small samples tests based on t and F distributions (single mean, difference of means, paired t- test and variance ratio test) – Chi-square test for independence of attributes and goodness of fit.

DESIGN OF EXPERIMENTS

Analysis of Variance (ANOVA) – Completely Randomized Design (CRD) – Randomized Block Design (RBD) – Latin Square Design (LSD).

STATISTICAL QUALITY CONTROL

Concept of process control - Control charts for variables $-\overline{X}$, R - charts - Control charts for attributes - p, np, c - charts - Tolerance limits.

Theory: 45 HoursTutorial: 15 HoursTotal: 60 Hours

REFERENCES

- 1. Veerarajan T., "Probability and Statistics", Tata McGraw-Hill, New Delhi, 2007 & 2nd Reprint 2004.
- Gupta S. P, "Statistical Methods", Sultan Chand & Sons Publishers, 2004.



4 Hours

5 Hours

4 Hours

9 Hours

9 Hours

- 3. Johnson R. A., "Miller & Freund's Probability and Statistics for Engineers", Sixth Edition, Pearson Education, Delhi, 2000.
- 4. Gupta S.C, and Kapur, J.N., "Fundamentals of Mathematical Statistics", Sultan Chand, Ninth Edition, New Delhi, 1996.
- 5. Walpole R. E., Myers S.L. & Keying Ye, "Probability and Statistics for Engineers and Scientists", Pearson Education Inc, 2002.

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U14FT*T*301 CONCEPTS OF FASHION AND DESIGN Course Outcomes

L	Т	Р	С
3	0	0	3

After successful completion of this course, the students should be able to

CO1: Acquire knowledge on elements & principles of design in context to apparels

- **CO2:** Acquire knowledge on color basics, dimensions, categories and their characteristics
- **CO3:** Ability to understand the dynamics of fashion and the role of fashion designers
- CO4: Acquire knowledge on the fashion forecasting process
- **CO5:** Appreciate the significance of a fashion portfolio & traditional world costumes and Traditional textiles of India

Pre Requisite: NIL

	CO/PO Mapping											
(S/N	(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-											
	Weak											
COs				Pro	gram	me O	utcom	es(PC	Ds)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1 2 3 4 5 6 7 8 9 10 11 12								12			
CO1	S	S	Μ									
CO2	S	S	М									
CO3	S	S S S										
CO4	S	S S M										
CO5	S	Μ	S									

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course –End Survey
End Semester Exam	

DESIGN CONCEPTS:

Design – definition, Design types- natural, stylized, geometric, historic and abstract, garment design- structural, decorative and functional. Elements of Design –line, shape, form, size, colour, texture and pattern. Principles of Design – Harmony, Balance, Rhythm, Emphasis and Proportion. Introducing elements and principles of design in apparels.



COLOUR CONCEPTS:

Color – Definition, Dimensions of colour-Hue, Value and Intensity, Colour categories and psychology - Warm and Cool Colours, Advancing and Receding colours, Colour theories – Prang colour system and Munsell colour system - colour harmonies.

FASHION FUNDAMENTALS:

Fashion -Definition, Classification of fashion, tangibles and intangibles of fashion, Principles of fashion, Fashion life cycle, Fashion adoption theories. Fashion terminology -Street fashion, Recurring fashion, Mass fashion, Fashion trend, Fashion shows, Style, Chic, Boutique, Haute Couture, Fashion designers – definition, role and study of leading fashion designers - French, Italian, American, Indian and British.

FASHION DESIGNING PROCESS:

Fashion Forecasting - role of forecasting agencies, techniques and presentation of forecast. Design process - Innovation of practice, analyzing the brief, Research inspiration – Research direction, prototyping, planning a collection, designer boards and portfolio presentation

HISTORIC COSTUMES AND TEXTILES: 11 Hours Origin and importance of clothing, Factors influencing costume changes. Costumes of ancient civilization – Egypt, Greece, Rome, British Medieval period and French empires during Renaissance period 1500 - 1600 AD, Traditional costumes of India, China and Japan. Traditional Textiles of India - Dacca Muslin, Jamdhani, Himrus and Amrus, Kashmir shawls, Kancheepuram and Baluchari saris, Paithani saris, Chanderi saris, Benaras Brocades, Bandhani, Patola, Ikkat, Block printed and Kalamkari.

Theory : 45 Hours

Total: 45 Hours

REFERENCES

- Kathryn McKelvey and Janine Munslow, "Fashion Design: Process, 1. Innovation and Practice", Blackwell Publishing, USA, 2005.
- Diane.T and Cassidy. T, "Colour forecasting" Blackwell Publishing, 2. 2005
- 3. Dar, S.N., "Costumes of India and Pakistan", D.B Tataporevala Sons and Co. Ltd., 1982.



7 Hours

11 Hours

- 4. Churye G.S, "Indian Costume", Popular Prakashan Pvt. Ltd., Bombay, 1995.
- 5. Hatanaka Kokyo Collection –"Textile arts of India", Chronide Books, 1996
- 6. Elaine Stone, Jean A. Samples, "Fashion Merchandising" McGraw-Hill Book Company 1985.
- 7. Russel Gillow and Nicholas Barnard, "Traditional Indian Textiles", Thames and Hudson Ltd.,London, 1991.
- 8. Douglas.A. Russel, "Costume History and Style", Prentice Hall Inc., 1983
- 9. Elizabeth Rouse, "Understanding Fashion", Blackwell Scientific Publication, Oxford, 1989.
- 10. Katherine Morris Lustre, "Historic Costume", Chas A. Bennett Co., Publishers, Peoria, Illinois, 1956.

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KNITTING TECHNOLOGY

L	Τ	P	С
3	0	0	3

Course Outcomes

U14FT7302

After successful completion of this course, the students should be able to

CO1:Recognize the weft knitted fabric production processes

- CO2: Outline the structure and properties of various weft knitted fabrics
- **CO3:**Acquire know ledge on the structure and properties of various advanced weft knitted fabrics
- **CO4:**Recognize the structure, properties ,applications and Latest developments in warp knitting

CO5:Acquire knowledge on the application of knitted structures for Technical Textiles

Pre Requisite :

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs	Programme Outcomes(POs)											
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	Μ										
CO2	S	М										
CO3	S	Μ	W									
CO4	S	S M W										
CO5	S	М										

U14FTT201 Fibre Science and Yarn Technology

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

PRINCIPLE OF WEFT KNITTING:

9 Hours

Comparison of Weaving and Knitting-Terms and definitions in weft knitting. - Knitting elements-Needles and its types, sinker, cam. Knitting action of latch, bearded and compound needles. - Classifications of weft knitting machines. Parts and functions of Plain, circular rib, and interlock machine. - Yarn quality for knitting.-selection of weft knitted fabrics

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WEFT KNIT STRUCTURES:

Classification of weft knit structure - Symbolic and diagrammatic representation of weft knit structures.- Comparison of single jersey, rib and interlock and purl structures-comparison of knit, tuck, float Stitchesunconventional stitches - Single jersey derivatives, accordion, check and stripe effect.- Rib derivatives derby rib and Swiss rib, royal rib, polka rib- Rib gated structures Milano Rib, Double pique and Pique poplin.- Knitted fabric Geometry Kc, Kw, Ks, R-knitted fabric defectsquality control

ADVANCED WEFT KNIT STRUCTURES:

Eight lock structure, Interlock gated structures Single pique, Ponte-di-Roma and Ottoman rib. - Derivatives of purl structure cross purl and basket purl - Blister fabrics – Introduction to Jacquard structures- socks knitting- flat bed knitting- weft knitting calculations for GSM and production- Latest developments in Weft knitting machines and fabrics, -Principles of seamless garment manufacture in circular and flat knitting 9 Hours

WARP KNITTING:

Comparison of warp and weft knitting-basic warp knitting elements, knitting cycle- tricot, Rachel machines. Comparison of tricot and Rachel Warp knitting -Basic stitches- pillar, blind lap, tricot, inlay, satin and atlas stitches. - Basic Tricot Warp Knit Structures full tricot, lock knit and loop raised fabrics. Basic Raschel Warp Knit structures- power nets, curtains and laces. - Latest developments in warp knitting machines. warp knitting calculations for GSM, production

KNITTED STRUCTURES FOR TECHNICAL TEXTILES: 9 Hours Different Application segments in Technical textiles-Weft knitted structures for technical textiles -application of Weft knitted structures for different end uses in technical textiles -Warp knitted structures for technical textiles -application of Warp knitted structures for different end uses in Geo Textiles, Medical textiles, Automotive, Sports and Industrial textiles.

Theory : 45 Hours

Total: 45 Hours



67

9 Hours

REFERENCES

- 1. Ajgaonkar D B, "Principles of Knitting", Universal Publishing Corporation, 1998.
- 2. Anbumani N, "Knitting Fundamentals, Machines, Structures and Developments", New Age International Publishers, 2007.
- 3. David Spencer., "Knitting Technology", Pergamon Press, Oxford 2005.
- 4. Pradip V Mehta, "Introduction to Quality Control for the Apparel Industry", ASQC Quality Press, 1992.

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L	Τ	Р	С
3	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Define and classify the patterns and memorize the steps involved in taking body measurement
- **CO2:** Prepare the basic block patterns for men, women and kids wear based on the principles and methodologies of drafting
- CO3: Prepare patterns for basic blocks and garment components using draping techniques
- **CO4:** Apply dart manipulation techniques to design, variation in garment components.
- **CO5:** Acquire knowledge on the techniques involved in pattern alteration and grading for various body measurements

Pre Requisite : NIL

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-												
Weak												
COs				Pro	gram	me Oi	utcom	es(PC)s)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1		S										
CO2	S	S										
CO3		М	S									
CO4		S	S									
CO5	S	S	Μ									

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

BASIC PATTERN MAKING:

9 Hours

Patterns – definition and types- individual and commercial patterns. Pattern making – definition and types of pattern making- drafting, draping, flat pattern techniques, their advantages and disadvantages. Tools for

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pattern making. Body measurements – importance, principles, precautions. Definition and standardization of size chart (ASTM Standards)

DRAFTING:

Basic principles and methodologies used to draft standard basic block patterns for men, women and kids wear- top, skirt and bifurcated garment (pyjama). Importance of pattern details - pattern name, cut number, on fold details, drill hole marks, darts, Seam allowances, notches, Balances marks and grain lines.

DRAPING:

Draping - Tools for Draping. Draping skills – preparation of basic blocksbodice, skirt, sleeve and trouser.

FLAT PATTERN TECHNIOUES:

Dart Manipulation - basic techniques - pivot method, slash and spread, measurement method. Applications of dart manipulation on bodice with darts on shoulder, armhole, side seam and waistline – transferring darts, combining, dividing, converting into seams and fullness – drafting princess line cut.

PATTERN ALTERATION:

Pattern alteration - definition, principles, techniques – Lengthening, shortening, widening, narrowing patterns according to required body measurements by slash and spread or slash and overlap methods.

GRADING:

Grading – Definition, Principles and types –manual grading and computerized grading for bodice block, sleeve and skirt.

Theory: 45 Hours

REFERENCES

- 1. Helen Joseph Armstrong, "Pattern Making for Fashion Design" Pearson Education (Singapore)Pvt. Ltd., 2005
- 2. Winifred Aldrich, "Metric Pattern Cutting" Blackwell Science Ltd., 1994
- 3. Amaden-Crawford Connie, "The Art of Fashion Draping (3rd edition)" Om Books International Publications, 2005
- 4. Hollen Norma R; Kundel Carlyn, "Pattern making by the flat pattern method", 1998

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5 Hours

Total: 45 Hours

8 Hours

8 Hours

6 Hours

- 5. Gillian Holman, "Pattern Cutting Made Easy", Blackwell Scientific Publications, 1997.
- 6. Natalie Bray "More Dress Pattern Designing" Blackwell Scientific Publications, 1986.
- 7. Gerry Cooklin, "Master Patterns and Grading for Women's Outsizes", Blackwell Scientific Publications, 1995.
- 8. Gerry Cooklin, "Master Patterns and Grading for Men's Outsize", Blackwell Scientific Publications, 1992.
- **9.** Jeenne Price and Bernard Zamkoff, "Grading Techniques for Modern Design" Fairchild Publications, 1990.

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L	Τ	Р	С
3	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Describe the federal classification of stitches & seams, seam finishes, stitch and seam defects.
- CO2: Develop creative designs for the different types of garment components.
- **CO3:** Construct the different types of garment components using suitable construction techniques.
- **CO4:** Construct the different types of garment fasteners using suitable construction techniques.
- **CO5:** Select suitable garment components and fasteners for different garment styles.

Pre Requisite: NIL

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs				Pro	ogram	me O	utcom	nes(PC	Ds)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	S	S									
CO2			S									
CO3	S S S											
CO4		S S S										
CO5		S	S									

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

9 Hours

SEAMS: Definition, Types of seams – Federal classifications, factors to be considered in the selection of seam, seam finishes and seam defects. **STITCHES:** Definition, stitch classes - Federal classifications, stitch parameters, factors to be considered in the selection of stitches. Stitching defects.

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9 Hours

FULLNESS: Definition, types- Darts – single, double pointed darts, Tucks - pin tucks, cross tucks, piped tucks, shell tucks. Pleats- knife pleats, box pleats, invertible box pleats, Kick pleats. Flare, godets, gathers, shirring, single, double frills and flounces.

HEMMING TECHNIQUES: Definition, types - machine stitched hem and hand-stitched hem.

NECKLINE FINISHES- preparation of bias strip, bias facing, bias binding, fitted facing and French binding.

9 Hours

SLEEVES: Types and construction of sleeves - plain, puffs, gathered, bell, bishop, circular, leg-o-mutton, Magyar sleeves, Raglan sleeves, kimono.

YOKES: Definition – Selection of yoke design, Types and construction of yoke - Simple yoke – yokes with or without fullness, midriff yokes, panel yokes, partial yokes.

9 Hours

COLLARS: Classification of collars, Types of collars– flat collars (peter pan collar, scalloped, flared, puritan collar, sailor collar) convertible collar, shirt collar with stand, Mandarin collar, shawl collar.

POCKETS: Types– patch pocket – creating variations, set in pocketbound pocket, welt pocket, pocket in a seam- front hip pocket, Attaching flap to a patch pocket.

9 Hours

PLACKETS: Inconspicuous plackets - continuous bound placket, twopiece placket, zipper placket – slot seam & lapped seam. Conspicuous plackets - Tailored or Kurtha placket, fly opening – button and buttonhole method, Zipper method.

FASTENERS: Types - button and buttonholes, hooks and eye, snaps, Velcro, eyelets, cords and rivets

Theory: 45 Hours

Total: 45 Hours

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REFERENCES:

- 1. Mary Mathews, "Practical Clothing Construction Part I and II", Paprinpack, Madras, 2000.
- 2. Ruth E.Glock, Grace I. Kunz, "Apparel Manufacturing Sewn Product Analysis", Pearson/Prentice Hall, 2005
- Claire Shaeffer, "Sewing for the Apparel Industry", Prentice-Hall Inc, New Jersey, 2001
- 4. Gerry Cooklin, "Garment Technology for Fashion Designers", Blackwell Science Ltd., 2001.
- 5. Leila Aitken., "Step By Step Dress Making Course", BBC Books, 1992
- 6. Amaden. C. and Crawford, A guide to Fashion Sewing, Fairchild Publications, 2001.
- 7. Fan.J., Yu.W., and Hunter.L., "Clothing Appearance and Fit: Science and Technology", The Textile Institute, Manchester, 2004
- 8. Joseph. H andAmstrong, "Pattern Making for Fashion Design", Pearson Education Inc, 2005.
- 9. Sumathi,G.J, " Elements of Fashion and Apparel Design", New Age International (P) Ltd, 2005.
- 10. Federal standards, stitches and seams.

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U14EET311 BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

L	Τ	P	С
3	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** The learners will acquire the knowledge of fundamental laws of electrical and electronics engineering.
- **CO2:** The students can state the definition of magnetic circuits.
- **CO3:** Students can choose suitable motor for desired application.
- **CO4:** The students have the ability to apply the fundamental laws of magnetic circuits to electrical machines.
- **CO5:** The learners can verify the truth table of digital logic gates.

Pre Requisite : NIL

.CO/PO Mapping												
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs	Programme Outcomes(POs)											
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	М											
CO2	Μ	М										
CO3	Μ		Μ									
CO4		Μ	Μ									
CO5		М	Μ									

Course Assessment methods:

Direct	Indirect				
Internal tests(I, II, III), Assignment,	Course End Survey				
End Semester Exam					

ELECTRIC CIRCUITS FUNDEMENTALS: 9 Hours

Electric current and Ohm's law – Resistance and Resistivity – Relation between Voltages, Current, Resistance and Power - Capacitance – Parallel plate capacitor – Energy stored in a capacitor.

ELECTROMAGNETISM:

Magnetic field - Field intensity, magnetic flux , Flux density - Permeability - Magnetic effects of electric current - Magnetic circuit -



9 Hours

75

Faraday's laws of Electromagnetic Induction – Self-inductance and Mutual inductance – Energy stored in magnetic field – Magnetic Hysteresis.

AC-CIRCUITS:

Alternating voltages and current – Sinusoidal waveform – cycle and frequency – RMS value – vector diagram of sine waves of same frequency – Alternating current through Resistance, Inductance and Capacitance – current through series circuits – Power factor – Active and Reactive power – Generation of three phase voltage – Voltages, Currents and Power in Star and Delta connected loads.

ELECTRICAL MACHINES (Qualitative Treatment Only): 9 Hours DC motor – Principle of operation – Back-emf and voltage equation – Torque and speed Characteristics of Series and Shunt connected motors – Transformer – Ideal Transformer relationship – Three phase induction motor – Cage rotor and Wound rotor – Principle of operation – Slip – Torque – Slip characteristics – Single phase induction motors.

ELECTRONIC CIRCUITS:

9 Hours

Semiconductor diode – Half wave and Full wave rectifier – Bipolar Polar Junction transistors – circuit configurations – static characteristics – load line and biasing – simple introduction to amplifiers – Introduction to Binary logic gates – AND, OR, NOT, NAND, NOR, EX-OR & EX-NOR.

Theory : 45 Hours

Total: 45 Hours

REFERENCES

- 1. B.L. Theraja, "Fundamentals of Electrical Engineering and Electronics", S. Chand Publishing, 2012.
- Thomas L Floyd, "Electronic Devices", 6th edition, pearson education, 2003.
- 3. Muthusubramanian.R, Salivahanan.S and Muraleedharan. K.A, "Basic Electrical Electronics and Computer Engineering", Tata Mcgraw Hill, second edition, 2006.
- 4. Thyagarajan.T, Sendur Chelvi .K.P, Rangaswamy T.R, "Engineering Basics", Revised second edition, New Age International P. Ltd publisher.

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U14FTP301 FASHION DESIGN LABORATORY – I

L	Т	Р	С
0	0	3	1

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Design patterns and garments using various drawing techniques.
- CO2: Prepare various color swatches based on color theories.
- CO3: Illustrate various garment components, accessories & human anatomy
- **CO4:** Design and present garment designs on croquis.

Pre Requisite : Nil

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs	Programme Outcomes(POs)											
	PO	PO										
	1	2	3	4	5	6	7	8	9	10	11	12
CO1			S							S		S
CO2		S	S							S		S
CO3			S							S		
CO4			S					S		S		S

Course Assessment methods:

Direct	Indirect					
Model Exams, Lab Exercises, End	1. Course-end survey					
semester Exams						

LIST OF EXPERIMENTS:

- 1. Motif Development Design Repeat and positioning
- 2. Object Drawing and Shading concepts
- 3. Drape of fabrics and shading with different mediums
- 4. Preparing swatches for dimensions of colour, different colour theories and harmonies
- 5. Rendering prints and textures with various fabric constructions (wovens, non-wovens and knit)
- 6. Drawing different Silhouettes and garment components sleeves, collars, necklines, cuffs, skirts, pants
- 7. Human Anatomy- Figure basics, Constant proportions, Shapes and



parts of human body. Study of different postures- Head- Face, Eyes, Lips, Nose, Hand - Fingers, Leg - Feet and Toes, Hand and Arms.

- Normal Drawing Eight head theory. Fashion Figure Drawing -Drawing croqui figures-stick, geometric, flesh - 8 ¹/₂ and 10 head figures.
- 9. Different postures of male and female figure ³/₄ view, back view, side view. Different poses like S-Pose, X-Pose, and T-pose.
- 10. Drawing croqui figures using template, model, imagination and photograph.
- 11. Thematic sketching of garments on croqui figures- Male and female
- 12. Thematic sketching of garments on croqui figures- Boy and girl

Experiments beyond the syllabus should be conducted

Total: 45 Hours

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U14FTP302

GARMENT COMPONENTS FABRICATION LABORATORY

L	Τ	P	С
0	0	3	1

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Acquire knowledge on operating SNLS machine and construction of garment components.
- **CO2:** Develop patterns using measurements for various garment components.
- **CO3:** Construct garment components using suitable construction technique.

Pre Requisite : NIL

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs		Programme Outcomes(POs)											
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	
	1	2	3	4	5	6	7	8	9	10	11	12	
CO1	S												
CO2	S	S	Μ										
CO3	S	S	S	S									

Course Assessment methods:

Direct	Indirect				
Model Exams, Lab Exercises, End	1. Course-end survey				
semester Exams					

LIST OF EXPERIMENTS

- 1. Identification of machine parts and functions of Single Needle Lock Stitch (SNLS) machines.
- 2. Preparing samples for various SPIs and thread tension
- 3. Preparing samples for basic Hand stitches.
- 4. Preparing samples for seams
- 5. Preparing samples for seam finish.
- 6. Preparing samples for Darts, pleats and tucks
- 7. Preparing samples for gathers, godets and frills
- 8. Preparing samples for Necklines Bias facing, Bias Binding and Fitted facing.
- 9. Preparing samples for Sleeves Plain, Puff, Raglan, Kimono, Cap Sleeve



- 10. Preparing samples for collars Peter Pan collar, Full shirt collar, Shawl collar.
- 11. Preparing samples for pockets Patch Pocket, Bound Pocket and Front Hip Pocket.
- 12. Preparing samples for plackets continuous bound placket, 2 piece placket, tailors placket, Fly opening and Zipper.

Experiments beyond the syllabus should be conducted

Total: 45 Hours

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U14EEP311 BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING LAB



Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Understand and verify the breadboard connections.
- CO2: Check the working condition of a cathode ray oscilloscope.
- CO3: Understand the basic laws of electric circuits.
- **CO4:** Understand the working of various electronic devices.
- **CO5:** Understand the performance of an amplifier to carryout different operations.

Pre Requisite : NIL

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs	Programme Outcomes(POs)											
	PO	PO	PO	PO	РО	PO	РО	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	Μ	W		Μ								
CO2	М	W		Μ					Μ			
CO3			Μ	Μ					Μ			
CO4	Μ		Μ						Μ			
CO5	Μ		Μ									

Course Assessment methods:

Direct	Indirect
Model Exams, Lab Exercises, End	1. Course-end survey
semester Exams	

LIST OF EXPERIMENTS:

- 1. Load Test on DC Shunt Motor
- 2. Load Test on DC Series Motor
- 3. Speed Control of DC Shunt Motor
- 4. Load Test on 3 Phase Induction Motor
- 5. Load Test on 1 Phase Induction Motor
- 6. Load Test on single phase transformer


- 7. Half wave and full wave rectifier
- 8. Characteristics of CE transistor configuration
- 9. Characteristics of PN diode
- 10. Verification of truth table of logic gates

Experiments beyond the syllabus should be conducted

Total: 45 Hours

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U14GHP301

SOCIAL VALUES

L	Т	Р	С
1	0	1	1

(Common to all branches of Engineering and Technology)

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Adopt and practice social values as his regular duties.
- **CO2:** Take over the social responsibilities.
- **CO3:** Give solutions and to manage the challenging social issues.
- **CO4:** Voluntarily participate and organize social welfare programmes.
- **CO5:** Explore his ideology of techno social issues and provide the best solution

Pre Requisite : NIL

	CO/PO Mapping											
(S/M	1/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs				Pı	ogran	nme (Dutcor	nes(P	Os)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1							W	W		Μ		S
CO2								S		М		
CO3							W	М			W	
CO4								W	S	М		W
CO5							М	W				W

Course Assessment methods:

Direct	Indirect
 Continuous Assessment End Semester Examination 	 Attitude Behavior

ORGIN OF SOCIETY

Evolution of universe: Creation theory,Big bang theory, Evolution theory, Permanence theory - Mithya, Maya – Evolution of living being - Evolution of Man – Formation of society and social values.

Practical: Group Discussion on Evolution of Man and formation of society, Panel discussion on Social values - Pancha Bhoodha Navagraha Meditation.

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SELF AND SOCIETY

Duty to self, family, society and world –Realization of Duties and Responsibilities of individuals in the society (Five fold cultures) – impact of social media on present day youth and correction measures.

Practical:Case study – interaction with different professionals.

EDUCATION& SOCIETY

Education: Ancient and Modern Models.

Practical: Making Short film on impact of education in social transformation.

DISPARITY AMONG HUMAN BEINGS

Wealth's for humans, Factors leading to disparity in human beings and Remedies.

Practical: Debate on disparity and social values.

CONTRIBUTION OF SELF TO SOCIAL WELFARE 3 Hours

Participation in Social welfare – Related programmes– Recognized association – Activities for social awareness – Programme by Government and NGOs – Benefits of social service – Balancing the family and social life.

Practical: In campus, off campus projects.

GENERAL PRACTICAL

Ashtanga Yoga: Pathanjali maharishi & Yoga – Involvement – Rules of Asanas -Suryanamaskara (12 Steps)- Meditation.

Standing : Pada Hastasana, Ardha Cakrasana, Trikonasana, Virukchsana (Eka Padaasana)

Sitting : Padmasana, Vakrasana, Ustrasana, Paschimatanasana.

Prone : Uthanapathasana, Sarvangasana, Halasana, Cakrasana,

Supine : Salabhasana, Bhujangasana, Dhanurasana, Navukasana.

Theory : 16 HoursTutorial:14 HoursTotal:30 Hours

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3 Hours

14 Hours

2 Hours

REFERENCES:

- 1. Steven, Weinberg, "The First Three Minutes" : A Modern View of the Origin of the Universe (English), Perseus books group,1977.
- 2. Vethathiri's Maharishi's, **"Vethathirian Principles of Life"** The World Community Service Centre, Vethathiri Publications, 2003.
- 3. Vethathiri's Maharishi's, **"Karma Yoga: The Holistic Unity"** The World Community Service Centre, Vethathiri Publications, 1994.
- 4. Vethathiri's Maharishi's, **"Prosperity of India"** The World Community Service Centre, Vethathiri Publications, 1983.
- 5. Swami Vivekananda, "The Cultural Heritage of India" 1stedition, The Ramakirshna Mission Institute of Culture, 1937.
- 6. Vivekananda Kendra Prakashan Trust, **"YOGA"**, Vivekanandha Kendra Prakashan Trust, Chennai, 1977

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SEMESTER IV

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U14MAT401 NUMERICAL METHODS (COMMON TO CE, ME, MCE, EEE, AE, AUE, TXT, FT & EIE)

L	Т	Р	С
3	1	0	4

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Solve a set of algebraic equations representing steady state models formed in engineering problems
- **CO2:** Fit smooth curves for the discrete data connected to each other or to use interpolation methods over these data tables
- **CO3:** Find the trend information from discrete data set through numerical differentiation and summary information through numerical integration
- **CO4:** Predict the system dynamic behaviour through solution of ODEs modeling the system
- **CO5:** Solve PDE models representing spatial and temporal variations in physical systems through numerical methods.
- **CO6:** Have the necessary proficiency of using MATLAB for obtaining the above solutions.

	CO/PO Mapping											
(S/M/	/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs				Pr	ogran	nme C	Outcor	nes(P	Os)			
	РО	РО	РО	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S			S								
CO2		S										
CO3				S								
CO4		S										
CO5			S									
CO6					S							

Pre Requisite : Nil.

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	1. Course – End Survey
Tutorial,	
End Semester Exam	

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INTRODUCTION:

Simple mathematical modeling and engineering problem solving – Algorithm Design – Flow charting and pseudocode - Accuracy and precision – round off errors

NUMERICAL SOLUTION OF ALGEBRAIC EQUATIONS: 7 Hours

Solution of nonlinear equations - False position method – Fixed point iteration – Newton Raphson method for a single equation and a set of non-linear equations Solution of linear system of equations by Gaussian elimination, Gauss Jordan method - Gauss Seidel method.

CURVE FITTING AND INTERPOLATION: 7 Hours

Curve fitting – Method of least squares – Regression Analysis - Newton's forward and backward difference formulas – Divided differences – Newton's divided difference formula - Lagrange's interpolation – Inverse interpolation.

NUMERICAL DIFFERENTIATION AND INTEGRATION: 6 Hours

Numerical differentiation by using Newton's forward, backward and divided differences – Numerical integration by Trapezoidal and Simpson's 1/3 and 3/8 rules – Numerical double integration.

NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS: 10 Hours

Initial value problems - Single step methods: Taylor's series method – Truncation error – Euler and Improved Euler methods – Fourth order Runge – Kutta method – Multistep methods: Milne's predictor - corrector method.

NUMERICALSOLUTIONOFPARTIALDIFFERENTIALEQUATIONS (PDEs):13 Hours

PDEs and Engineering Practice – Laplace Equation derivation for steady heat conduction – Numerical solution of the above problem by finite difference schemes – Parabolic Equations from Fourier's Law of Transient Heat Conduction and their solution through implicit schemes – Method of



Lines – Wave propagation through hyperbolic equations and solution by explicit method. Use of MATLAB Programs to workout solutions for all the problems of interest in the above topics.

Theory: 45 Hours Tutorial: 15 Hours Total: 60 Hours

REFERENCES

- 1. Steven C.Chapra and Raymond P. Canale, "Numerical Methods for Engineers with Programming and Software Applications", SixthEdition, WCB/McGraw-Hill, 1998.
- 2. John H. Mathews and Kurtis D. Fink, "Numerical Methods using Matlab", Fourth Edition, Prentice Hall of India, 2004.
- 3. Gerald C. F. and Wheatley P.O, "Applied Numerical Analysis", Sixth Edition, Pearson Education Asia, New Delhi, 2002.
- 4. Sastry S.S, "Introductory Methods of Numerical Analysis", Third Edition, Prentice Hall of India Pvt Ltd, New Delhi, 2003.
- 5. Kandasamy P., Thilagavathy K. and Gunavathy K., "Numerical Methods", S.Chand Co. Ltd., New Delhi, 2007.

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U14GST001 ENVIRONMENTAL SCIENCE AND ENGINEERING

L	T	Р	С
3	0	0	3

(Common to all branches of Engineering and Technology) Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Play a important role in transferring a healthy environment for future generations
- **CO2:** Analyze the impact of engineering solutions in a global and societal context
- **CO3:** Discuss contemporary issues that results in environmental degradation and would attempt to provide solutions to overcome those problems
- **CO4:** Ability to consider issues of environment and sustainable development in his personal and professional undertakings
- CO5: Highlight the importance of ecosystem and biodiversity
- CO6: Paraphrase the importance of conservation of resources

Pre Requisite : Nil.

				С	O/PC) Map	ping					
(S/M/V	W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs				Pr	ogran	nme C	utcon	nes(P	Os)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1						S	S					
CO2						S	S					
CO3							Μ					
CO4						W	Μ	W				
CO5	Μ						Μ					
CO6						Μ	W					

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course –End Survey
End Semester Exam	

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INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES 10 Hours

Definition, scope and importance - Need for public awareness - Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and overutilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems -Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies - Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies - Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification -Role of an individual in conservation of natural resources - Equitable use of resources for sustainable lifestyles.

ECOSYSTEMS AND BIODIVERSITY

14 Hours

ECOSYSTEM : Concept of an ecosystem – Structure and function of an ecosystem: Producers, consumers and decomposers, Energy flow in the ecosystem, Food chains, food webs and ecological pyramids - Ecological succession – Introduction, types, characteristic features, structure and function of the (a) Forest ecosystem (b) Grassland ecosystem (c) Desert ecosystem (d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) –

BIODIVERSITY : Introduction to Biodiversity – Definition: genetic, species and ecosystem diversity – Biogeographical classification of India – Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and local levels – India as a mega-diversity nation – Hot-spots of biodiversity – Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

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ENVIRONMENTAL POLLUTION

Definition – Causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – Solid waste Management: Causes, effects and control measures of urban and industrial wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: floods, earthquake, cyclone and landslides.

SOCIAL ISSUES AND THE ENVIRONMENT 7 Hours

From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns, case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. – Wasteland reclamation – Consumerism and waste products – Environment Protection Act – Air (Prevention and Control of Pollution) Act – Water (Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness

HUMAN POPULATION AND THE ENVIRONMENT 6 Hours

Population growth, variation among nations – Population explosion – Family Welfare Programme – Environment and human health – Human Rights – Value Education – HIV / AIDS – Women and Child Welfare – Role of Information Technology in Environment and human health – Case studies.

Field Work

Visit to local area to document environmental assets- river / grassland / hill / mountain, visit to local polluted site- urban / rural / industrial / agricultural, study of common plants, insects, birds, study of simple ecosystems-pond, river, hill slopes etc.,

Theory: 45 Hours

Total: 45 Hours



REFERENCES:

- 1. Miller T.G. Jr., Environmental Science, Wadsworth Publishing Co., 2013
- 2. Masters G.M., and Ela W.P., Introduction to Environmental Engineering and Science, Pearson Education Pvt., Ltd., Second Edition.
- 3. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad India., 2002
- 4. Trivedi R.K and Goel P.K., "Introduction to Air pollution" Technoscience Pubications. 2003
- 5. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media. 1996
- 6. Cunningham, W.P., Cooper, T.H., & Gorhani E., Environmental Encyclopedia, Jaico Publ., House, Mumbai, 2001
- 7. Wager K.D., Environmental Management, W.B. Saunders Co., Philadelphia, USA, 1998
- 8. Townsend C., Harper J and Michael Begon, "Essentials of Ecology", Blackwell science Publishing Co., 2003
- 9. Syed Shabudeen, P.S. Environmental chemistry, Inder Publishers, Coimbatore. 2013

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U14FTT401 APPAREL PRODUCTION TECHNOLOGY

L	Т	P	С
3	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Acquire knowledge on the processes involved in apparel production and preparation of spec sheet
- CO2: Recognize the properties and characteristics of raw material for apparel manufacture
- **CO3:** Gain knowledge in pattern layout planning and preparation of construction flow for apparel production
- **CO4:** Identify the problems of fit and indicate remedies
- CO5: Acquire knowledge on apparel finishing processes

Pre Requisite :

1. U14FT7304 Garment Components Fabrication

	CO/PO Mapping											
(S/M/V	(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak							/eak				
COs				Pro	ogram	me O	utcon	nes(PC	Ds)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	S	Μ							S		
CO2		S										
CO3	М	S	S							S		
CO4	М	М								S		
CO5	S	М										
0	A			41								

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

PROTO SAMPLES & SPEC SHEETS: 9 Hours Apparel production process- flow process. Analyzing specification sheet- sample preparation and approval. Preparation of specification sheet for children's frock, ladies top, and men's trousers- working diagrams, seam and stitch specification and size chart. Preparation of proto pattern and developing production pattern.

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RAW MATERIAL SELECTION:

Factors affecting selection of fabric- precautions while handling different fabrics while laying, marking, cutting and sewing. Sewing Thread properties and seam performance -seam strength, seam elasticity, sewing problems. Components- label, linings, Interlining, Elastic, shoulder pads, Seam binding and tape - performance properties of the above components.

PATTERN LAYOUT PLANNING:

Importance of grain in garments, principles and types of layout, transferring patterns on fabrics. Listing garment components and planning the construction process flow for children's frock, ladies top, and men's trousers

FITTING:

Standards of good fit - ease, line, grain, set, balance. Steps in assembling a blouse and checking fit. Solving fitting problems in Top, skirt, trouser by pattern alteration.

APPAREL FINISHING PROCESS: 9 Hours Fusing and pressing- definition, process, requirements, equipments and methods. Packing - Function, types of package forms, Types of materials. packaging methods, packing shipping packaging equipments.

Theory: 45 Hours

REFERENCES

- Harold Carr and Barbara Latham, "The Technology of Clothing 1 Manufacture", Om Book Service, 2002.
- 2. Jacob Solinger, "Apparel Production Handbook", Reinhold Publications, 1998.
- Laing R.M., Webster J, "Stitches and Seams", The Textile 3. Institute, Manchester, 2004.
- Gerry Cooklin, "Garment Technology for Fashion Designers", 4. Blackwell Science Ltd., 2001.
- Claire Shaeffer, "Sewing for Apparel Industry", Prentice Hall, 5. 2000



Total: 45 Hours

9 Hours

9 Hours

- 6. Mary Mathews, "Practical Clothing Construction, Part I and II", Paperback Ed., Madras, 2000
- 7. Joseph. H and Amstrong, "Pattern Making for Fashion Design", Pearson Education Inc, 2005
- 8. Fan.J., Yu.W., and Hunter.L., "Clothing Appearance and Fit: Science and Technology", The Textile Institute, Manchester 2004.
- 9. Leila Aitken., "Step By Step Dress Making Course", BBC Books, 2004.
- 10. Ruth E Glock and Grace I Kunz, "Apparel Manufacturing Sewn Product Analysis", Prentice Hall, New Jersey, Fourth Edition, 2005

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L	Т	Р	С
3	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Acquire knowledge in different methods of spreading of fabrics with respect to type of fabric and to calculate the marker efficiency.
- **CO2:** Describe the basic principles of working of different types of cutting machineries used in apparel production
- CO3: Develop skill in setting and adjustment parts of sewing machines
- **CO4:** Develop skills to recognize various parts and their working principles in advanced garment sewing machines.
- **CO5:** Acquire knowledge on special machineries used in apparel production

Pre Requisite : NIL

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs				Pro	ogram	me O	utcon	nes(PC	Ds)			
	PO	PO	РО	PO	PO	PO	РО	РО	PO	РО	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S				Μ							
CO2	S				М							
CO3		М										
CO4		M										
CO5	S											

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

SPREADING MACHINES:

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

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CUTTING MACHINES:

Introduction to cutting machines. Types and functions of cutting machines – straight knife, round knife, band knife cutting machines. Notches, drills, die cutting machines. Computerised cutting machines. Maintenance of cutting machines. Common defects in cutting and their remedies. Latest Developments.

SEWING MACHINE- SNLS:

Basic parts of sewing machine –primary and auxiliary parts and their functions. Bobbin case / Bobbin hook, Throat plate– Take up devices – Tensioners – Feed dog – Pressure foot. Types of needles – Parts of needles and their function. Needle finishes. Adjustments of Stand height – pedal – Needle Bar – Stitch length selection – Feed timing – Needle and Bobbin Thread Tension – Stitch cycle timing diagram. Common defects and remedies. Special attachments in sewing machines – guides, folders, stackers, trimmers, ziggers.

MULTI THREAD SEWING MACHINES: 10 Hours

Over lock machines - Types of Over lock machines. Parts and their functions. Threading diagram for over lock machines. Stitch Cycle Diagram for over lock machines – Adjustment of Needle height, Feed dog height, angle, Differential feed ratio, Position of upper and lower knives, loopers. Defects and Remedies.

Flat lock machines – Types. Parts and their functions. Threading diagram of flat lock machines – Stitch cycle diagram. Adjustment of parts – Needle height, feed dog height, differential feed ratio, loopers. Maintenance of flat lock machines. Defects and Remedies.

SPECIAL PURPOSE SEWING MACHINES: 9 Hours

Introduction to different special purpose sewing machines. Basic working of Feed of Arm, Button Hole sewing, button sewing, Bar tack, blind stitch machines. Embroidery sewing machines. Latest developments in sewing machines. Sewing machine maintenance - Maintenance schedule for various machines. Maintenance audit.

Theory : 45 Hours



Total: 45 Hours

8 Hours

REFERENCES

- 1. Harold Carr and Barbara Latham, "The Technology of Clothing Manufacture", Om Book Service, 2002.
- 2. Shaeffer Claire, "Sewing for the Apparel Industry", Prentice Hall, New Jersey, 2001.
- 3. Singer, "Sewing Lingerie", Cy DeCosse Incorporated, 1991.
- 4. Laing R.M. and Webster J, "Stitches and Seams", The Textile Institute, Manchester, 1999
- 5. Technical Advisory Committee of AAMA, " A New Look at Apparel Mechanization", 1978.
- 6. Jacob Solinger, "Apparel Production Handbook", Reinhold Publications, 1998.

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FABRIC STRUCTURE AND DESIGN



Course Outcomes

U14FTT403

After successful completion of this course, the students should be able to

- **CO 1:** Acquire knowledge on the elements of woven fabric design.
- CO2: Develop elementary fabric weave structures.
- **CO3**: Acquire knowledge on colour theory, modifications of colour and colour and weave effects.
- **CO4:** Develop structures for complex woven fabric.
- **CO5**: Describe the characteristics, properties and applications of woven fabric structures

Pre Requisite :

U14FTT201 Fiber Science and Yarn Technology

U14FT7202 Weaving Technology

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs				Pr	ogran	nme O	utcon	nes(P	Os)			
	PO	РО	PO	PO	РО	PO	РО	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	S								S		
CO2		S	S									
CO3			S							S		
CO4	S S											
CO5		S										

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course end survey
Tutorial,	
End Semester Exam	

BASIC WEAVES:

Elements of woven design, Construction of elementary weaves – plain – warp rib- weft rib – mat. Twills – modification of twills. Satin – sateen and their derivatives. Ordinary and Brighton honey comb– Huckaback. Crepe weaves.

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9+3 Hours

BEDFORD CORDS AND MOCK LENO:

Plain faced – twill faced. Wadded – modifications. Welt - piques: wadded piques – Loose back and fast back welts and piques. Mock leno – Distorted mock -leno.

DOBBY AND JACQUARD: Basic Dobby, Jacquard Design. Spot figuring – arrangement of figuring for dobby and jacquard.

COLOR THEORY:

light and pigment theory – modification of color – color combination – application of colors – color and weave effects.

EXTRA FIGURED WEAVES: Extra warp and extra weft figuring. Extra warp and extra weft figuring with two colors.

BACKED FABRICS:

Warp and weft back – reversible and non-reversible.

PILE FABRICS: warp pile - fast wire pile - terry weaves - terry stripe terry check. Weft pile: plain back – twill back velveteen – Lashed pile corduroy – Weft plush – Length, density and fastness of pile.

DOUBLE CLOTH:

Classification – self stitched – face to back – back to face – Combination face to back and back to face stitched double cloth. Wadded double cloth – weft and warp Wadded double cloth - Center warp & Weft Stitched double cloth.

Theory: 45 Hours Tutorial: 15 Hours Total: 60 Hours

REFERENCES

- 1. Gokarneshan.N., "Fabric Structure and Design", New Age International (P) Ltd., 2011.
- 2. Grosicki Z., "Watson's Textile Design & Color: Elementary weaves & Figure", Blackwell Science, Commerce place, 1998.
- 3. H.Nisbet, "Grammar of textile Design", Tarporevala sons & Co. Pvt. Ltd., 1994.

4. W.S. Murphy, "Textile weaving & Design", Abhishek Publications, 2000

9+3 Hours

9+3 Hours

9+3 Hours

9+3 Hours

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L	Т	P	С
3	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Explain principles of thermodynamics, renewable energy and power plants
- **CO2:** Discuss the working of IC engines and air conditioning and refrigeration.
- **CO3:** Understand and explain the various manufacturing processes and power transmission
- **CO4:** Demonstrate basic manufacturing process
- CO5: Explain various types of power transmission

Pre Requisite : Nil

CO/PO Mapping												
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs				Pro	ogram	me O	utcom	nes(PC	Ds)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S											
CO2		Μ										
CO3	W											
CO4	Μ	M I I I I I I I I I I I I I I I I I I I										
CO5	Μ											

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course end survey
End Semester Exam	

LAWS OF THERMODYNAMICS

9 Hours

First law of thermodynamics – statement and application, steady flow of energy equation, Second law of thermodynamics. Heating and Expansion of Gases, Expression for work done, internal energy, hyperbolic and polytropic processes. Properties of Steam, Dryness fraction, latent heat, total heat of wet steam.

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POWER PLANTS

Classification of Power Plants, Steam, Diesel, nuclear and Hydro Power Plants. Types of turbines, working of a single stage impulse and reaction turbine.

Alternate Sources of Energy: (Solar, Wind, Tidal, Geothermal, Ocean Thermal Energy Conversion (OTEC). Wind/ Solar grid fed power plant, Solar /Water air heaters – Techno-economics of power plants and energy sources.

INTERNAL COMBUSTION ENGINES

Classification of IC engines, Main components of IC engines, working of a 4 stroke and 2 stroke petrol and diesel engine, differences between 4 stroke and 2 stroke engine.

Refrigeration and Air Conditioning: principle of vapour compression and vapour absorption refrigeration systems. Air conditioning, terminology and classifications. Humidification and Air conditioning.

MANUFACTURING PROCESSES

Basic principles of Arc and Gas Welding, Soldering and Brazing, Extrusion, Forging, Rolling, and Drawing Processes. Milling – Types, **Operations and Equipments.**

POWER TRANSMISSION

Types of drives, belt drives – flat and V belts, rope drives, chain drive, gear drives – spur, helical, bevel and worm gears (Descriptive treatment only) – gear trains, simple and compound.

Theory : 45 Hours

REFERENCES

- 1. Shanmugam G, Palanichamy M S, "Basic Civil and Mechanical Engineering", Tata McGraw Hill Company, New Delhi, 2nd Edition, 2000.
- 2. Venugopal.K. and Prabu Raja, "Basic Mechanical Engineering", Anuradha Publications, Chennai, 2007.

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9 Hours

9 Hours

9 Hours

Total: 45 Hours

9 Hours

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- 3. Sarkar B. K., "Thermal Engineering" Tata McGraw Hill Company, New Delhi. 2000
- 4. Rao N., "Manufacturing Technology: Foundry, Forming and Welding", Tata McGraw Hill Co., New Delhi, Paperback Edition. 1998
- 5. James Brown, "Advanced Machining Technology Handbook", McGraw Hill, New York, 1998

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U14FTP401FASHION DESIGN LABORATORY – IILCourse Outcomes0



After successful completion of this course, the students should be able to

- **CO1:** Demonstrate skill on tools of fashion designing software to prepare digital apparel designs.
- CO2: Sketch apparel designs using designing software.
- CO3: Create woven and knitted designs on Lectra Kaliedo software
- CO4: Create printed designs on Lectra Kaliedo software
- **CO5:** Appreciate significance of communicating informative graphics all through apparel production process

Pre Requisite :

- U14FTT301 Concepts of Fashion and Design
- U14FTP301 Fashion Design Laboratory-I

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs				Pro	gram	me Oi	utcom	es(PC)s)			
	PO	PO	PO	PO	PO	РО	РО	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1					S							
CO2			S									
CO3					S							
CO4		S										
CO5									Μ	S		

Course Assessment methods:

Direct	Indirect
Model Exams, Lab Exercises, End	Course End Survey
semester Exams	

LIST OF EXPERIMENTS

- 1. Creating motives and textures in Adobe Photoshop
- 2. Creating motives and croquies in Adobe Illustrator
- 3. Development of woven design in Adobe Photoshop/ Adobe Illustrator
- 4. Creating garments on croquies in Adobe Photoshop/ Adobe Illustrator
- 5. Development of T-shirt design in Adobe Photoshop/ Adobe Illustrator
- 6. Development of woven designs in Lectra-Kaliedo weave software
- 7. Development of knitted designs in Lectra-Kaliedo knit software
- 8. Development of printed designs in Lectra-Kaliedo print software



- 9. Creating a mood board and a color board based on a theme
- 10. Preparation of digital designs for children's wear and accessories
- 11. Preparation of digital designs for women's wear and accessories
- 12. Preparation of digital designs for men's wear and accessories

Experiments beyond the syllabus should be conducted.

Total: 60 Hours

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U14FTP402 APPAREL MACHINERY LABORATORY

L T P C 0 0 4 2

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Determine appropriate sewing parameters for any desired quality of stitching of apparels
- **CO2:** Apply skills in identifying the procedure for preparing the specified quality of stitching by selecting the required sewing parameters

CO3: Demonstrate skill to troubleshoot when faulty stitches occur.

Pre Requisite:

U14FTT304 Garment Components Fabrication

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1		S										
CO2			S	S								
CO3			S									

Course Assessment methods:

Direct	Indirect
Model Exams, Lab Exercises, End	Course end survey
semester Exams	

LIST OF EXPERIMENTS

- 1. Determination of Threading path and Stitches per inch in Single Needle Lock Stitch Machine.
- 2. Adjustment of needle height, feed dog height and feed dog angle in single needle lock stitch machine
- 3. Determination of Threading path and stitches per inch in over lock stitch machine.
- 4. Adjustment of needle thread and looper thread tension and feed ratio in over lock stitch machine.
- 5. Determination of Threading path and stitches per inch in Flat lock stitch machine.
- 6. Adjustment of needle thread looper thread tension



and feed ratio in Flat lock stitch machine.

- 7. Adjustments in button sewing machine for button hole type, size of button
- 8. Adjustments in Button Holing machine for type of button hole, stitches per inch
- 9. Adjustments in Feed off the arm Machine.
- 10. Adjustments in Flat lock elastic attaching machine
- 11. Adjustments in Electronic Zig Zag Sewing machine.
- 12. Adjustment in bar tacking machine.

Experiments beyond the syllabus should be conducted.

Total: 60 Hours

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U14FTP403 FABRIC STRUCTURE AND DESIGN ANALYSIS LABORATORY

L	Т	Р	С
0	0	4	2

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Identify woven fabric designs and its commercial name by fabric feel

CO2: Analyze and calculate the woven fabric parameters

CO3: Analyze and calculate the knitted fabric parameters

Pre Requisite :

U14FTT201 Fiber Science and Yarn Technology

U14FTT202 Weaving Technology

CO/PO Mapping

(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	РО	PO	PO	РО	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1		S										
CO2		S	Μ	S						S		
CO3		S	Μ	S						S		

Course Assessment methods:

Direct	Indirect
Model Exams, Lab Exercises, End	Course end survey
semester Exams	

LIST OF EXPERIMENTS

1. Analysis of fabrics - Commercial name & fabric appreciation

Woven Fabric Analysis

- 2. Plain
- 3. Twill
- 4. Satin and Sateen
- 5. Huck a back
- 6. Honey comb
- 7. Extra figured weaves
- 8. Jacquard design
- 9. Double cloth
- 10. Pile fabric Terry weave



Knitted fabric analysis

11. Single Jersey

12. Rib

Experiments beyond the syllabus should be conducted.

Total: 60 Hours

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U14GHP401 NATIONAL AND GLOBAL VALUES

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(Common to all branches of Engineering and Technology)

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Act as a good and responsible citizen.

- **CO2:** Conserve and protect eco cycle.
- **CO3:** Voluntarily work with global welfare organization and provide solution for global peace.

CO4: Invent his Technical design by considering humanity and nature.

Pre Requisite:

U14GHP301 Social Values

CO/PO Mapping												
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1							Μ	S		Μ		S
CO2							S					
CO3							W	Μ	Μ	Μ		
CO4							S	S			S	

Course Assessment methods:

Direct	Indirect
1. Continuous Assessment	1. Attitude
2. End Semester Examination	2. Behavior

ROLE OF A RESPONSIBLE CITIZEN

4 Hours

Citizen - its significance-National and Global perspectives.

Practical: Group discussion on National and Global values.

GREATNESS OF INDIAN CULTURE

2 Hours

Emerging India – past and present, about Culture, Morality and spirituality– Beauty of Unity in diversity - Impact of western culture in India and Indian culture over other countries.

Practical:Demonstration and impact measurements of simple and good actions.

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GLOBAL WELFARE ORGANISATIONS

Education – Health – Nature – Peace

Practical:Organizing an event linking with one of the Organizations In campus /off campus.

PRESERVING NATURE

Appreciating the flora and fauna on Earth - Importance of Ecological balance – Conservation.

Practical: Trekking, field visit.

GLOBAL PEACE

One World and One Humanity - Global Peace.

Global personalities:Thiruvalluvar, Vallalar, Vivekanadar, Mahatma Gandhi,Vethathiri Maharishi – Plans for world peace.

Practical: Group discussion on individual plans for world peace.

GENERAL PRACTICAL

Simplified physical Exercise – Kayakalpa practice (Follow up practice) – Meditation - Theory & Practice

Pranayama : Bhastrika, Kapala Bhati, Nadi suddhi, Sikari, Sitali.

Mudhra : Chin Mudhra, Vayu Mudhra, Shunya Mudhra, Prithvi Mudhra, Surya Mudhra, Varuna Mudhra, Prana Mudhra, Apana Mudhra, Apana Vayu Mudhra, Linga Mudhra, Adhi Mudhra, Aswini Mudhra.

Theory . 14 mours in actical . 10 mours in otal. 30 mour	Theory : 14 Hours	Practical : 16 Hours	Total: 30 Hours
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REFERENCES:

- Drunvalo Melchizedek, "The Ancient Secret of the Flower of Life", Vol. 1, Light Technology Publishing; First Edition (April 1, 1999)
- 2. Dr.M. B. Gurusamy, "Globalisation Gandhian Approach" Kumarappa Research Institution, 2001.
- 3. Vethathiri's Maharishi's, *"Karma Yoga: The Holistic Unity"* The World Community Service Centre, Vethathiri Publications, 1994.
- 4. Vethathiri's Maharishi's, *"World peace"* The World Community Service Centre, Vethathiri Publications,1957.
- 5. Vethathiri's Maharishi's, *"Atomic Poison"* The World Community Service Centre, Vethathiri Publications, 1983.



2 Hours

2 Hours

4 Hours

- Vethathiri's Maharishi's, *"The World Order Of Holistic Unity"* The World Community Service Centre, Vethathiri Publications, 2003.
- 7. Swami Vivekananda, "*What Religion Is*" 41st edition, The Ramakirshna Mission Institute of Culture, 2009.

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SEMESTER V

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U14FTT 501 FASHION APPAREL DESIGN AND DEVELOPMENT



Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Acquire knowledge on basic principles in designing and developing garment patterns.
- **CO2:** Developing skills in preparation of garments by implementing the various measurements, pattern development and construction methods for children's, women's and men's garments.
- **CO3:** Trace the knowledge on the different varieties of woven and knitted garments.
- **CO4:** Assess the suitability of garment patterns, fabrics, seams to fit the individuals.
- CO5: Assess the comfort ability parameters on woven and knitted garments

Pre Requisite:

U14FTT301 Concepts of Fashion and Design

U14FTT303 Basic Pattern Making and Adaptation

CO/PO Mapping												
(S/M/W	(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	РО	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S											
CO2		S	Μ									
CO3	Μ			Μ								
CO4	Μ											
CO5									Μ			

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

CHILDREN'S WEAR:

10 Hours

Designing and pattern development- measurements-standard size charts for children's wear. Quality requirements for selecting suitable fabric,



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seams and stitches for children wear. Step-by-step garment drafting process and construction sequence – baba suit, romper, baby frock.

WOMEN'S WOVEN WEAR:

Designing and pattern development – measurements - standard size charts for women's wear. Quality requirements for selecting suitable fabric, seams and stitches for women's wear. Step-by-step garment drafting procedure and construction sequence - salwar kameez, skirts plain, gored, pleated and blouses - saree blouse, skirt blouse, katori blouse.

WOMEN'S KNIT WEAR:

Designing and pattern development- measurements – standard size charts for women's knitwear. Step-by-step garment drafting procedure and construction sequence-corsets, camisole, nighty and dresses - princess line, empire line, tent dress and maternity wear.

MEN'S WOVEN WEAR:

Designing and pattern development – measurements – standard size charts for men's wear. Quality requirements for selecting suitable fabric, seams and stitches for men's wear. Step-by-step garment drafting procedure and construction sequence – Trousers-pleated, jeans, cargos, full sleeve shirt and single breasted coat.

MEN'S KNIT WEAR:

Designing and pattern development – measurements – standard size charts for men's knitwear. Step-by-step garment drafting procedure and construction sequence – T-shirt, elastic shorts and briefs.

Theory: 45 Hours

REFERENCES

- Helen Joseph and Armstrong, "Pattern Making for Fashion 1. Design", Pearson Education, 2005.
- 2. Winifred Aldrich, "Metric Pattern Cutting for Men's Wear",

9 Hours

9 Hours

7 Hours

Total: 45 Hours

10 Hours

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Blackwell Science, 2000.

- 3. Winifred Aldrich, "Metric Pattern Cutting for Children's Wear and Baby Wear", 3rd Edition, Blackwell Science, 2001.
- 4. Singer, "Sewing Pants That Fit", Cowles Creative Publishing Inc., 1989.
- 5. McKelvey Kathryn, "Fashion Source Book", Blackwell Science, 1994
- 6. Gerry Cooklin, "Garment Technology For Fashion Designers", Blackwell Science, 2000.
- 7. Claire Shaeffer, "Fabric Sewing Guide", Chilton Book Company -Radnor, Pennsylvenia, 1997.
- 8. "The Complete Book of Sewing", DK Publishers, London, 1996.
- 9. Mary Mathews, "Practical Clothing Construction" Part I and II, 2003.
- 10. Raul Jewel, "Encyclopedia of Dress Making", APH Publishing Corporation, New Delhi, 2000.
- 11. Zarapkar.K.R," Zarapkar system of cutting" Navneet publications ltd, Mumbai, 2010.

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Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Acquire knowledge in classification and parameters for raw materials and tools for surface ornamentation
- **CO2:** Classify and identify different hand embroidery stitches and traditional embroidery
- **CO3:** Recognize and identify the machine embroidery types and processes
- **CO4:** Understand the embroidery production processes and quality parameters in computerized embroidery
- CO5: Acquire knowledge on types of accessories and its production processes

Pre Requisite :

U14FTT301 Concepts of Fashion and Design

U14FTP301 Fashion Design Laboratory

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs	Programme Outcomes(POs)											
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	М	S										
CO2	М	S	Μ									
CO3	S	S										
CO4	S	Μ										
CO5	М	Μ										

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	1. Course End Survey
Tutorial,	
End Semester Exam	

INTRODUCTION:

7+2 Hours

Embroidery – meaning and importance- Types and Classification. Study and compatibility of needles, thread, frames, backing materials and



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fabrics for embroidery. Attachments to sewing machines for embroidery.

HAND EMBROIDERY:

Hand embroidery stitches - classification - running, couching, button hole, satin, long and short, wheat, chain, stem, herringbone, cross stitch, knotted stitches, fish bone. Indian traditional embroideries -Phulkari, Kasuti, Kashida, Kutch work, Chikkankari, Kantha, Tribal embroidery stitches, designs, colors and materials used.

MACHINE EMBROIDERIES AND SURFACE **ORNAMENTATION:**

Machine Embroideries and Surface ornamentation – types - eyelet work, cutwork, lace work, drawn thread work, drawn fabric work, patch work, mirror work, applique, shaded embroidery, shadow work, badala work, bead and sequins work and bobbin thread embroidery.

COMPUTERIZED EMBROIDERY:

Computerized Embroidery Machine - Multi Head Embroidery Machine - Functions and Features. Embroidery Production Process - designing, punching and digitizing, special effects, networking. Selection of thread, color and stitches for computer controlled embroidery machines. Study of frames. Special attachments. Quality control aspects.

FASHION ACCESSORIES:

Fashion Accessories - footwear, handbags, belts, gloves, hats, scarves, Jewellery - designing, selection of materials, product development and production.

Tutorial: 15 Hours Total: 60 Hours Theory: 45 Hours

REFERENCES

1. Parul Bhatnagar, "Traditional Indian Costumes and Textiles", Abhishek Publications, Chandigarh, 2004.

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10+4 Hours

10+3 Hours

10+4 Hours

8+2 Hours

- 2. Jay Diamond and Ellen Diamond, "Fashion, Apparel, Accessories, Home Furnishings" Pearson Prentice Hall, New Jersey, 2007.
- 3. Usha Srikant, "Designs for a lifetime", Samata Enterprises, Mumbai, 2002.
- 4. Shailaja D. Naik, "Traditional Embroideries of India", A.P.H Publishing Corporation, New Delhi, 1996.
- 5. Gini Stephens Frings, "Fashion From Concept to Consumer", Prentice Hall, New Jersey, 1999.
- 6. Sheila Paine, "Embroidered Textiles", Thames and Hudson Ltd., 1990.
- 7. Gail Lawther, "Inspirational Ideas for Embroidery on Clothes and Accessories", Search Press Ltd., 1993.
- 8. Training Manual for Embroidery Machine Operators, TAJIMA, UIET, Tirupur, 2003.
- 9. Training Manual for Embroidery Machines, Barudan, Tirupur, 2002.

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U14FTT503 CLOTHING SCIENCE AND FIT

Course Outcomes

L	Τ	Р	С
3	0	0	3

After successful completion of this course, the students should be able to

- CO1: Acquire Knowledge on the biomechanical engineering design of clothing
- CO2: Recognize and associate objective and subjective evaluation of clothing fit
- **CO3:** Recognize and associate the Effect of fibre properties, yarn structure and fabric construction on the fabric appearance
- **CO4:** Recognize and associate the Effect of fibre properties, yarn structure and fabric construction on the dimensional stability and the fabric comfort
- **CO5:** Acquire Knowledge and associate the Effect of fibre properties, yarn structure and fabric construction on the fabric Serviceability and fabric handle

Pre Requisite :

- U14FTT201 Fibre science and yarn Technology
- U14FT*T*403 Fabric structure and Design
- U14FT*T*505 Textile And Apparel Quality Evaluation

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	S										
CO2	S	S										
CO3	S	S										
CO4	S	S										
CO5	S	S										

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

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BIOMECHANICAL ENGINEERING DESIGN OF CLOTHING

6 Hours

Introduction to bio mechanical engineering design of textile and fashion products- Comfort and compression theraphy- design of socks

SIZING SYSTEMS AND EVALUATION OF CLOTHING FIT:

12 Hours

9 Hours

Definition, Development of sizing system, International sizing, Principles of sizing system. Definition of fit, Importance of Fit, Standards of Fit, influence of clothing Fit, Testing methods for dimensional Fit, Objective and Subjective evaluation of fit.

AESTHETICS AND APPEARANCE:

Selection of fibre, yarn structure and fabric construction; their effect on pilling, fastness, lusture, overall appearance and Shade variation. Fabric properties related to appearance.

DIMENSIONAL STABILITY: Study of factors that affect Hygral expansion, relaxation shrinkage, swelling shrinkage, felting shrinkage, dimensional stability to dry cleaning and dry heat with respect to fibre properties.

SERVICEABILITY:

Study of Factors affecting properties such as Snagging, abrasion resistance, tearing strength, tensile strength, bursting strength, fusing, Seam strength and slippage with respect to fiber properties, yarn structure and fabric design.

FABRIC HANDLE AND COMFORT:

Objective evaluation of fabric hand by KES and FAST-.Comfort-Effect of fibre properties, yarn structure, fabric design, fabric construction and treatments on the fabric properties such as thermal conductivity and warmth, air permeability, breathability, moisture transport – wetting and wicking; clothing comfort – thermal comfort, heat and moisture transfer, moisture sensations; tactile comfort – pressure sensations.

Theory : 45 Hours



9 Hours

9 Hours

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REFERENCES

- 1. Engineering Apparel Fabrics and Garments, Woodhead Publishing Ltd., J Fan, L. Hunter, 2009
- 2. Saville B.P, "Physical Testing of Textiles", The Textile Institute, Wood head Publishing Ltd, Cambridge, 1999
- 3. Fan, Yu and Hunter., Clothing Appearance and fit, Textile Institute, Woodhead Publishing Ltd., England, 2004
- 4. Ed.Postle R., Kawabata.S and Niwa M., "Objective Evaluation of Fabrics", Textile Machinery Society, Japan, Osaka, 1983.
- 5. Sandra Betzina, Fast Fit-Easy Pattern Alterations for Every Figure, The Taunton press inc., Singapore, 2003
- 6. Biomechanical engineering of textile and clothing, Edited by Y. Li and X-Q. Dai ,Woodhead Publishing Ltd., England, 2006

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U14FTT504 TEXTILE CHEMICAL PROCESSING

Course Outcomes



After successful completion of this course, the students should be able to

- **CO1:** Acquire knowledge on chemical processing of cotton and blended materials.
- **CO2:** Identify the suitable process to process the fibre, yarn and fabrics through preparatory and dyeing processes.
- **CO3:** Analyse the parameters and identify the recipes for chemical processing of different materials.
- CO4: Aquire Knowledge and Analyse the parameters for Printing techniques
- **CO5:** Acquire knowledge on the eco-friendly processes and the effluent treatments.

Pre Requisite :

U14CH7204 Chemistry for Textiles

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S											
CO2		Μ										
CO3		S										
CO4	Μ	Μ										
CO5	Μ		S				S					

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

PRETREATMENTS:

9 Hours

Introduction to wet processing. Process sequence in wet processing for wovens and knits. Singeing - electric and gas singeing. Desizing -

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chemical and enzymatic. Scouring – alkaline and enzymatic. Bleaching – hypochlorite and peroxide bleaching, optical whitening. Mercerizing - tension, tensionless and tubular mercerization.

DYEING:

Introduction- Dyeing equipments - jigger, winch, soft flow, jet dyeing machine, J-box, padding mangles, package dyeing machine and garment dyeing machine. RFT dyeing. Classification of dyes. Dyeing of cotton fabrics using direct, reactive, vat and sulphur dyes. Dyeing of polyester (carrier, HTHP and thermo sol) and cellulosic blends (one bath and two bath process). Fastness properties of dyes.

PRINTING:

Print paste - ingredients and preparation. Styles of printing - direct style of printing on cotton using pigments and reactive dyes, discharge style of printing cotton using pigments on reactive ground, resist style of printing cotton on reactive ground, Tie and dye, batik. After treatments of printed goods.

METHODS OF PRINTING:

Block, Stencil, Roller, Rotary, Flat bed, Transfer and Chest printing. Screen Making. Special prints – kadi, rubber, foam, glitter, leather, foil, flock and pearl. Latest developments in printing.

OUALITY ASSURANCE AND ECO – FRIENDLY WET PROCESSING: 10 Hours

Need for Quality control – areas of Quality control in wet processing (Water, PH, Temperature, MLR, Time) – computer color matching. Importance of Eco – friendly wet processing, List of banned dyes and chemicals, German ban, Eco-Labels, Eco-Testing. Textile effluent treatment.

Theory : 45 Hours

Total: 45 Hours

7 Hours

12 Hours

7 Hours

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REFERENCES

- V A Shenai, Technology of Textile Processing- Vol. III, 1975, Sevak Publications
- 2. V.A. Shenai, "Technology of Dyeing –Volume VI", Sevak Publications, Bombay, 2000.
- 3. "Chemical Processing of Textiles-I" Nodal Centre for Upgradation of Textile Education (NCUTE), 2000.
- 4. John Shore, "Cellulosics Dyeing", Society of Dyers and Colourists, Mumbai, 2005
- 5. Lesile W.C. Miles, "Textile printing", Society of Dyers and Colourists, Mumbai,2003
- 6. "Chemical technology In the pre-treatment Processes of textiles", S.R. Karmakar, ISBN: 0-444 50060-1, Nov, 1999
- 7. Datye K.V.and Vaidya A.A., "Chemical Processing of Synthetic Fibres and Blends", John Wiley and Sons, Newyork, 1984.
- 8. "Chemical Preparatory processing in Textiles" NCUTE Programmes series, march 13-14,2000.
- 9. "Dyes and pigments": New research, Arnold r. Lang Editor, Nova Science Publishers, Inc. New York, January 8, 2013
- 10. "Eco Friendly Textiles The German Ban", NITRA Publishing Ltd., 1996.
- 11. "Eco-Friendly Textiles, Challenges to the Textile Industry", Textile Committee. March 10, 1995.

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U14FTT505 TEXTILE AND APPAREL QUALITY EVALUATION



Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Acquire knowledge in sampling techniques of fibers, yarns and fabrics and also in various methods of measuring yarn number
- CO2: Gain knowledge in principles of working of yarn testing instruments
- CO3: Gain knowledge in principles of working of fabric testing instruments
- CO4: Acquire knowledge on testing of fabric handle properties
- **CO5:** Acquire knowledge on testing instruments used for accessories and fastness properties of fabrics

Pre Requisite :

U14FT7401 Apparel Production Technology

U14FTT403 Fabric Structure and design

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S											
CO2		Μ										
CO3		S										
CO4	М	Μ										
CO5	Μ		S				S					

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

SAMPLING TECHNIQUES AND YARN NUMBERING SYSTEM 9 Hours

Definition – random, biased sampling. Sampling techniques for fibre, yarn and fabric. Definition of Moisture Regain and Moisture Content. Standard conditions for testing samples.

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Yarn count – Definition. Yarn Numbering System – Direct, indirect. Simple calculations.

YARN TESTING

9 Hours

Determination of yarn count, yarn twist- single and folded yarns. Measurement of yarn hairiness-optical, singeing and hairiness tester-Causes for yarn hairiness. Classification of variation. Methods of measuring evenness – Black board, ASTM standards, Cutting and weighing methods. Electronic capacitance – evenness tester – Uster standards.

Yarn faults – classification – Classimat. Measurement of yarn strength – Single yarn strength tester – Tensorapid, Tensojet - lea strength tester. Count Strength Product (CSP), its significance.

FABRIC TESTING - MECHANICAL PROPERTIES9 HoursFabric tensile strength tester – raveled strip method – Grab methods.Fabric tear strength tester – Ballistic strength tester – Hydraulic burstingstrength tester. Fabric Abrasion Resistance - Martindale abrasion tester.Fabric Pilling - I.C.I Pillbox tester. Crimp – Influence of crimp on fabricproperties – Shirley crimp tester

FABRIC TESTING – AESTHETICS AND COMFORTPROPERTIES9 Hours

Fabric Drape - Drape meter. Fabric Stiffness - Shirley Stiffness tester, Fabric crease resistance and crease recovery measurements. Fabric Permeability - Fabric air permeability tester and water permeability tester.

APPAREL AND ACCESSORY TESTING

Seam strength and seam slippage testing. Peel bond strength testing-Button, Zipper strength testing. Colour fastness testing – Washing fastness- Rubbing fastness – Light fastness. Apparel dimensional stability – spirality, skewing and its measurement.

Theory : 45 Hours

Total: 45 Hours

9 Hours



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REFERENCES

- 1. Arindam Basu, "Textile Testing Fibre, Yarn and Fabric", The South India Textile Research Association, Coimbatore, 2001.
- 2. B.P. Saville, "Physical Testing of Textiles", Woodhead Publishing Ltd., 1999.
- 3. Grover E G and Hamby D. S, "Hand Book of Textile Testing and Quality Control", Wiley Eastern Pvt. Ltd., New Delhi, 2000.
- 4. Sundaram V, "Hand book of Textile Testing", CTRL Publication, Bombay, 2003.
- 5. Booth, J.E., "Principles of Textile Testing", CBS Publishers and Distributors, 2002.
- 6. BSI Hand books, British Standard Institution, Manchester, 2007
- 7. BIS Hand Books, Bureau of Indian standards, Delhi, 2007.

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L	Т	Р	С
0	0	4	2

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Develop skills in fashion illustration and designing for children's & ladies' wear.
- **CO2:** Preparing basic blocks for different measurements and apply the grading techniques.
- **CO3:** Choose the suitable garment styles and develop pattern for children and ladies wear
- **CO4:** Apply the construction techniques for developing children and ladies garments and preparing the operation flow chart for the garments.
- **CO5:** Estimating the cost particulars for the developed children and ladies garments

Pre Requisite :

U14FTT301 Concepts of fashion & design

U14FTP301 Fashion Design Laboratory - 1

U14FTT303 Basic pattern making and adaptation

U14FTT304 Garment components fabrication

	CO/PO Mapping											
(S/M/W	(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	Μ										
CO2	S	S	Μ									
CO3		S	S	S								
CO4			Μ	S					S	W	М	М
CO5			Μ	S					S	W	М	М

Course Assessment methods:

Direct	Indirect				
Model Exams, Lab Exercises, End	Course End Survey				
semester Exams					

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LIST OF EXPERIMENTS:

- 1. Development of basic block patterns-top, skirt and bifurcated garments and grading of any one basic pattern
- 2. Designing and developing pattern for Baby set- Jabla, panty, bib and bonnet.
- 3. Construction of Baby set- Jabla, panty, bib and bonnet
- 4. Designing and developing pattern for Rompers
- 5. Construction of Rompers
- 6. Designing and Developing Pattern for Ladies Skirt and Top
- 7. Construction of Ladies Skirt and Top
- 8. Designing and Developing Pattern for Ladies Salwar
- 9. Construction of Ladies Salwar
- 10 Designing and Developing Pattern for Ladies Kameez
- 11 Construction of Ladies Kameez
- 12 Marker Planning for any one garment

Experiments beyond the syllabus should be conducted.

Total: 60 Hours

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U14FTP502 TEXTILE CHEMICAL PROCESSING LABORATORY

L	Τ	P	С		
0	0	4	2		

Course Outcomes

After successful completion of this course, the students should be able to

- CO1: Acquiring knowledge on bleaching, dyeing and printing process
- **CO2:** Estimation and application of chemicals and dyes for processing the textile materials.
- **CO3:** Demonstrate ability to formulate appropriate shade and process parameters of chemical process.
- CO4: Apply the different types of machines for chemical processing

CO5: Acquire knowledge on fastness properties of dyed materials.

Pre Requisite :

U14CHT204 Chemistry for Textiles

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S											
CO2		Μ		S								
CO3	Μ	S		Μ								
CO4		Μ										
CO5		Μ										

Course Assessment methods:

Direct	Indirect
Model Exams, Lab Exercises, End	Course End Survey
semester Exams	

LIST OF EXPERIMENTS:

- 1. Bleaching of cotton using Hydrogen peroxide.
- 2. Dyeing of cotton with direct dyes on woven/ knitted fabric.
- 3. Dyeing of cotton with Reactive dyes on woven/ knitted fabric.
- 4. Dyeing of cotton with Vat dyes on woven/ knitted fabric.
- 5. Dyeing of protein fibres with Acid dyes.
- 6. Stripping and re-dyeing of cotton fabric.

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- 7. Dyeing of Polyester using carrier.
- 8. Identification of dyes.
- 9. Direct style of printing on cotton fabrics.
- 10. Discharge style printing on cotton.
- 11. Resist style printing on cotton.
- 12. Determination of colour fastness of dyed fabrics using laundero- meter and crock meter.

Experiments beyond the syllabus should be conducted.

Total: 60 Hours

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U14FTP503 TEXTILE QUALITY EVALUATION LABORATORY



Course Outcomes

After successful completion of this course, the students should be able to

- CO1: Acquire knowledge in basic working principles of testing instruments
- **CO2:** Develop skills in preparing samples for various types of experiments and to conduct experiments.

CO3: Analyze and interpret the data obtained from the testing instruments

CO4: Conclude based on the standards and present the results

CO5: Apply different testing machines for testing purposes.

Pre Requisite : NIL

	CO/PO Mapping											
(S/M/V	(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S											
CO2		S		S								
CO3		S		S								
CO4				S						Μ		
CO5	S											

Course Assessment methods:

Direct	Indirect					
Model Exams, Lab Exercises, End	Course End Survey					
semester Exams						

LIST OF EXPERIMENTS

- 1. Determination of Yarn Count and Lea Strength
- 2. Determination of Single / Ply Yarn Twist
- 3. Determination of Yarn Appearance Grade
- 4. Determination of Fabric Abrasion Resistance
- 5. Determination of Fabric Tensile Strength
- 6. Determination of Color Fastness to Rubbing Crock meter
- 7. Determination of Fabric Stiffness and Crease Recovery Angle



- 8. Determination of Fabric bursting strength and fabric Drape.
- 9. Determination of fabric pilling.
- 10. Determination of fabric tear strength.
- 11. Determination of colorfastness to perspiration.
- 12. Determination of shrinkage of woven and knitted fabrics.

Experiments beyond the syllabus should be conducted.

Total: 60 Hours

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SEMESTER VI

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U14GST007 PROFESSIONAL ETHICS

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Understand the ethical theories and concepts
- CO2: Understand an engineer's work in the context of its impact on society
- CO3: Understand and analyze the concepts of safety and risk
- CO4: Understand the professional responsibilities and rights of Engineers
- CO5: Understand the concepts of ethics in the global context

Pre Requisite: Nil

CO/PO Mapping												
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	Μ		Μ			S		S				
CO2				S				S	М			
CO3						S		S				
CO4						S		S				М
CO5				S		S						

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

ENGINEERING ETHICS AND THEORIES

9 Hours

Definition, Moral issues, Types of inquiry, Morality and issues of morality, Kohlberg and Gilligan's theories, consensus and controversy, Professional and professionalism, moral reasoning and ethical theories, virtues, professional responsibility, integrity, self respect, duty ethics, ethical rights, self interest, egos, moral obligations.

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SOCIAL ETHICS AND ENGINEERING AS SOCIAL **EXPERIMENTATION**

Engineering as social experimentation, codes of ethics, Legal aspects of social ethics, the challenger case study, Engineers duty to society and environment.

SAFETY

Safety and risk – assessment of safety and risk – risk benefit analysis and reducing risk – the Three Mile Island and Chernobyl case studies. Bhopal gas tragedy.

RESPONSIBILITIES AND RIGHTS OF ENGINEERS 9 Hours Collegiality and loyalty – respect for authority – collective bargaining – confidentiality – conflicts of interest – occupational crime – professional rights – employee rights – Intellectual Property Rights (IPR) – discrimination.

GLOBAL ISSUES AND ENGINEERS AS MANAGERS, CONSULTANTS AND LEADERS

Multinational Corporations – Environmental ethics – computer ethics – weapons development – engineers as managers – consulting engineers – engineers as expert witnesses and advisors – moral leadership – Engineers as trend setters for global values.

Theory : 45 Hours

Total: 45 Hours

REFERENCES

- 1. Mike Martin and Roland Schinzinger, "Ethics in Engineering". (2005) McGraw-Hill, New York.
- 2. John R. Boatright, "Ethics and the Conduct of Business", (2003) Pearson Education, New Delhi.
- 3. Bhaskar S. "Professional Ethics and Human Values", (2005) Anuradha Agencies, Chennai.
- 4. Charles D. Fleddermann, "Engineering Ethics", 2004 (Indian Reprint) Pearson Education / Prentice Hall, New Jersey.
- 5. Charles E. Harris, Michael S. Protchard and Michael J Rabins, "Engineering Ethics - Concepts and cases", 2000, Wadsworth Thompson Learning, United States.

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9 Hours

9 Hours

9 Hours

APPAREL PRODUCT DEVELOPMENT

L	Т	P	С
3	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Acquire knowledge on segments of fashion industry and able to classify apparel products, influence of customer, and different generations behind the costume changes
- **CO2:** Define knowledge on developing fashion concepts such as concept generation, concept screening, line concept etc. Create fashion idea, manipulation of design elements.
- **CO3:** Ability to identity creative design, develop prototype, line adoption. Knowledge on technical design.
- **CO4:** Acquire skills on product positioning strategy, sizing and fit in material selection, final assembly and finishing, garment presentation.
- **CO5:** Acquire knowledge on defining proto development fabric sourcing and selection. Analysis of functional and aesthetics of fabrics and trims. Visualization and communication design on to manufacturability.

Pre Requisite : Nil

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs	Programme Outcomes(POs)											
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1		S	S	S								
CO2	S	S	S	S								
CO3	Μ	S	S	S	М							
CO4	S	S	S									
CO5		S	S		Μ					Μ		

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

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FASHION INDUSTRY OVERVIEW :

Segments of the fashion industry – history and categories, Classification of apparel products. Background to the world of fashion- influence of the customer; different generations and motivations behind the changes.

DEVELOPING FASHION CONCEPT:

Design logic of apparel products, concept generation, concept screening. Line concept – Synthesize current issues, describe fashion trends, establish line direction, describe materials, identify group concepts and analyze current line. Principles of creative fashion ideas. Manipulation of Design Elements - silhouette, proportion, pattern, garment details, accessories, texture, prints, colour, fabric.

LINE DEVELOPMENT AND PRESENTATION:

Creative design - Develop designs, Create prototype. Line adoption -Determining styles and balancing assortments. Technical design - perfect styling and fit, engineer production patterns, samples, costing and grade patterns. Presentation: Review for adoption, line review, line / style release.

ANALYSIS OF PRODUCT DEVELOPMENT:

Product Positioning Strategy – Sizing and fit in material selection – Final assembly and finishing – Garment presentation.

PROTO DEVELOPMENT:

Fabric Sourcing and Selection. Analysis of functional and aesthetic characteristics of fabrics and trims - Co-ordinating with availability, ability to enhance product aesthetics and functionality and cost. Visualization and Communication design into manufacturability.

Theory : 45 Hours

REFERENCES

- 1. Maurice J. Johnson and Evelyn C.Moore, "Apparel Product Development", Second Edition, Prentice Hall Upper saddle river, New Jersey, 2001.
- 2. Ruth E Glock and Grace I Kunz, "Apparel Manufacturing Sewn Product Analysis", Prentice Hall, New Jersey, Fourth Edition, 2005.
- 3. Kathryn McKelvey and Janine Munslow, "Fashion Design: Process,



9 Hours

9 Hours

Total: 45 Hours

9 Hours

9 Hours

9 Hours

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Innovation and Practice", Blackwell Publishing, USA, 2005.

- 4. Donald R.Lehmann, Rusell S.Winer, "Product Management", M.C.Graw Hill International, 1996
- 5. Mastudaira T and Suresh M.N., "Design Logic of Textile Products", Textile Progress, Textile Institute, Manchester, 2007.

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APPAREL MERCHANDISING



Course Outcomes

U14FTT602

After successful completion of this course, the students should be able to

CO1: Acquire knowledge on fashion industry and types of apparels industry and business concepts adopted.

- **CO2:** Understand types of apparel markets, marketing research and strategies.
- **CO3:** Gain knowledge on sourcing, supply chain management, and resource planning
- **CO4:** Acquire knowledge on role and responsibilities of merchandiser. Communication with stake holders, product development, line planning and presentation.
- CO5: Developing knowledge on merchandise management.

Pre Requisite : NIL

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs				Pro	gram	me Oi	utcom	es(PC)s)			
	PO	PO	PO	PO	РО	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1										S	W	
CO2			Μ							Μ	W	
CO3			Μ						S	S	W	
CO4		Μ	Μ						S	S	W	
CO5									Μ	М	W	

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

APPAREL INDUSTRY OVERVIEW:

Organization of the Apparel Business: Introduction to apparel industry. Types of apparel exporters. Business concepts applied to the apparel industry.

MARKETING:

9 Hours

142

10 Hours

Functional organization of an apparel firm. Responsibilities of a



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marketing division - marketing objectives and Strategies - Marketing research - Types of markets: Retails and wholesale strategies for merchandise distribution- retailers - sourcing flows and practices. Marketing plan. Labeling and licensing.

SOURCING:

Need for sourcing - sourcing materials - Manufacturing Resources Planning

Material Resource Planning. Vendor Management- Sourcing strategies
Overseas sourcing. Supply chain and demand chain analysis -Materials management for quick response.

MERCHANDISING:

Definition of merchandising, Functions of merchandising division -Role and responsibilities of a export merchandiser - different types of buyers. Communications with the buyers - awareness of current market trends – product development –Tech pack analysis - Order confirmation process

Export Merchandising -. Classification of exporters - Manufacturer exporter, Merchant exporter, Job worker(CM/CMT). Introduction to buying house. Retail Merchandising- Merchandising strategies, Roles and Responsibilities of retail merchandisers.

MERCHANDISE MANAGEMENT:

Product management - model stock plan, constraining factors, types of suppliers and selection criteria, category management, merchandise management planning in retail and export segments. Brand Management - Brand documentation- Brands and brand awareness. Documentation on brands. Brand formulation. Brand Licencing.

Theory : 45 Hours

REFERENCES

- 1. Philip Kotler, Kelvin Lane Keller, Abraham Koshy and Mithileshwar Jha, "Marketing Management: A South Asian Perspective", Pearson Education India, 2006.
- 2. Evelyn C Moore, "Math for Merchandising", Wiley Eastern Inc., 2002.

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8 Hours

10 Hours

8 Hours

Total: 45 Hours

- 3. John Donnellan "Merchandise Buying and Management", Farichild Publications, inc., New York, 2002
- 4. Ruth E Glock and Grace I Kunz, "Apparel Manufacturing", Prentice Hall, New Jersey, Fourth Edition, 2005.
- 5. "The Textile Industry: Winning strategies for the New Millennium", Volume II, Textile Institute., 1999

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U14FTT603 APPAREL PRODUCTION PLANNING AND CONTROL

L	Т	Р	С
3	1	0	4

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Acquire knowledge on basic techniques of production planning & control in garment industry
- **CO2:** Identify the suitable plant site location, layout and production system for apparel industry based on style and quantity of merchandise
- **CO3:** Prepare the flow process grids, control forms and scheduling charts for production control in apparel industry
- **CO4:** Explain the cut order planning and material management system for apparel industry
- **CO5:** Determine the capacity planning and line balancing techniques to achieve balanced production

Pre Requisite:

U14FTT401 Apparel Production Technology

U14FTT402 Apparel Machinery and Equipment

(S/M/W	CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs	Programme Outcomes(POs)											
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S											
CO2		S	Μ								S	
CO3		S		S	S					S	Μ	
CO4		S		S	S							
CO5	S	S		S	Μ						S	

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course end survey
Tutorial,	
End Semester Exam	

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PRODUCTION PLANNING AND CONTROL: 9 Hours

Definition, Objectives of production control, relationship of production control to the functional areas of a manufacturing organization.

Pre planning: Pre-production functions, Importance of Preproduction function. Lead Time, Product development - steps from prototype to production sample. Product data management.

PLANT LAYOUT:

Plant site location. Plant Layout - definition – types of production layout, criteria for evaluation of a plant layout. Basic production line layout. Determining minimum space requirement, Government regulations for plant layouts.

APPAREL MANUFACTURING SYSTEMS:8+5 Hours

Section Production systems - whole garment production system, Progressive bundle system, Unit production system, Multiple flow system, modular manufacturing systems – their advantages and disadvantages. Guide lines for choosing suitable production system.

Flow Process Grids and Charts – Flow process grid construction, flow process grids for production control.

Cut Production Analysis: Cut order planning – types of spreads, spreading methods, marker utilization, economic cut quantities.

MATERIAL MANAGEMENT:

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 10+5 Hours

PLANT LOADING AND CAPACITY PLANNING: Determination of machine requirements for a new factory -calculation of labor requirements

LINE BALANCING: determination and allocation of man power and



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8 Hours

10+5 Hours

machines for balanced production in existing plant for a given target, application of line balancing techniques – balance control.

Theory: 45 Hours Tutorial: 15 Hours Total: 60 Hours

REFERENCES

- 1. Garg R.K, and Sharma V., "Production Planning and Control Management", Dhanpat Rai Publishing, 2003.
- 2. Jacob Solinger, "Apparel Production Handbook", Reinhold Publications, 1998.
- 3. Telsang (Martand) "Industrial Engineering and Production Management" S. Chand & Company Ltd., 2008
- 4. Rajesh Bheda "Managing Productivity of Apparel Industry" CBI publishers and distributors, New Delhi 2002.
- 5. David J Tyler, "Material Management in Clothing Production", Prentice Hall, New jersey, 1991.
- 6. Carr Harold, Latham Barbara, "The Technology of Clothing Manufacture", Om Book Service, 2004.
- 7. Bracken Bury, "Knitted Clothing Technology", Om Books Service, 1999.
- 8. Gerry Cooklin, "Introduction to Clothing Manufacture", Blackwell Science Ltd., 2005.
- 9. Gerry Cooklin, "Garment Technology for Fashion Designers", Om Books service, 1997.
- 10. Chuter, A.J., "Introduction to Clothing Production Management", Oseney Mead, 2001.

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U14FTT604 APPAREL FINISHING AND CARE



Course Outcomes

After successful completion of this course, the students should be able to

- CO1: Acquire knowledge on types of finishes on fabrics and garments.
- **CO2:** Analyse the different conditions and chemicals needed for finishing of materials
- CO3: Acquire knowledge on Denim Finishes and advanced finishes.
- **CO4:**Acquire knowledge on un-conventional finishes and their applications.
- **CO5:** Acquire knowledge on Quality assurance, stains and their removal in apparel.

Pre Requisite : NIL

	CO/PO Mapping											
(S/M/W	/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	Р
	1	2	3	4	5	6	7	8	9	10	11	01
												2
CO1	S											
CO2	Μ	Μ	W									
CO3	S	Μ	Μ									
CO4	S											
CO5	Μ	Μ										

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

INTRODUCTION:

9 Hours

Reason for finishing, types and classification of finishing, Mechanical finishes- Calendering, Sanforizing, Compacting & Stentering requirements for garment finishing. Garment Dyeing Machines for Finishing. Selection of sewing thread, accessories with respect to garment

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dyeing and finishing. Preparation of fabrics for garment dyeing and finishing.

FUNCTIONAL FINISHING:

Water repellent/proof, flame retardant, heat resistant, mildew proof, moth proof, anti-static, soil release, UV protection, anti microbial and elastomeric finish (without compaction). Resin finishing - durable press, wash-n-wear, wrinkle free, silicone finishing and their methods of application.

SPECIAL FINISHES:

Process conditions, machineries, chemicals used for various special effects-stone wash, acid wash, enzyme wash, bio-polishing, sand blasting, ozone and laser fading, tinted denim, over dyed denim, reverse denim, pseudo denim, stretch denim, peach skin effect, quick wash denim, vintage wash, enzyme- soda wash, dextrose- caustic wash, sueding wash, golf ball wash, tie 'n' wash, marble wash and crush finish.

UNCONVENTIONAL FINISHING METHODS:

Plasma treatment, finishing using micro capsules, nano and electro chemical treatment of textile materials, self cleaning and phase changing materials.

APPAREL CARE:

Types and characteristics of stains, Identification of stains, selection of stain removers, Stain removal methods - Oil, colour matter, Garment laundering equipments and procedures, Use of care labels and standards / norms for care labels.

Quality Assurance in finished garments: Quality requirements, Standards and Limitations for finished garments and accessories.

Theory : 45 Hours

REFERENCES

1. Nomeia D, souza., "Fabric Care", New Age International (P) Ltd, Chennai, 1998.



9 Hours

9 Hours

Total: 45 Hours

9 Hours

9 Hours

- 2. Shenai V A, "Technology of Textile Finishing", Sevak Publications, Mumbai,1995.
- 3. Dr.G.Nalankilli and Dr.S.Jayaprakasam, "Textile Finishing" SSMIIT Staff's and Student's Co-op society. 1997
- "Garment Wet Processing Technical Manual", AATCC/SDC, 1994. Whittall N S, "Laundering and Dry Cleaning", vol.8, Textile Progress, 1996.
- 5. Pradip V Mehta, "An Introduction to Quality Control for the Apparel Industry", ASQC Quality Press, 1992.
- 6. Goldman R F and Lyle D S, "Performance of Textiles" John Wiley and Sons, New York 1987.
- 7. Hall A J, "Textile Finishing", Elsevier Publishing Co. Ltd, 1986.
- 8. Richard A Scott, "Textiles for Protection", The Textile Institute, Woodhead Publishing Ltd., CRC Press. 2005.
- 9. W.D. Schiendler and P.J. Hauser, "Chemical Finishing of Textiles", The Textile Institute, Woodhead Publishing Ltd., 2004.

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U14FTP601 APPAREL PRODUCTION LABORATORY- II

L	Т	Р	С		
0	0	4	2		

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Develop skills in fashion illustration and designing for ladies & men's wear
- CO2: Preparation of basic blocks for ladies wear
- **CO3:** Develop patterns as per the required styles for ladies & men's garments and practice grading for different sizes
- **CO4:** Practice construction of apparel, outline construction flow process for various ladies & men's garments
- **CO5:** Estimate fabric consumption by marker making and costing of apparels

Pre Requisite :

U14FTT301 Concepts of fashion & design

U14FTP301 Fashion Design Laboratory - 1

U14FTT303 Basic pattern Making and Adaptation

U14FTT304 Garment Components Fabrication

U14FTP501 Apparel Production Laboratory – I

	CO/PO Mapping											
(S/M/W	M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	Μ										
CO2	S	S	Μ									
CO3		S	S	S								
CO4			Μ	S					S	W	Μ	M
CO5			Μ	S					S	W	Μ	Μ

Course Assessment methods:

Direct	Indirect
Model Exams, Lab Exercises, End	Course End Survey
semester Exams	

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LIST OF EXPERIMENTS:

- 1. Development of basic block patterns-top, skirt and bifurcated garments and grading of any one
- 2. Designing and Developing Pattern for Brassier and Panties
- 3. Construction of Brassier and Panties
- 4. Designing and Developing Pattern for Choli
- 5. Construction of Choli
- 6. Designing and Developing Pattern for Men's Formal Shirt
- 7. Construction of Men's Formal Shirt
- 8. Designing and Developing Pattern for Men's Formal Trousers
- 9. Construction of Men's Formal Trousers
- 10. Designing and Developing Pattern for Knitted Basic T-shirt
- 11. Construction of Knitted Basic T-shirt
- 12. Marker Planning for any one garment

Experiments beyond the syllabus should be conducted

Total: 60 Hours

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APPAREL CAD LABORATORY

Course Outcomes

U14 FTP602



After successful completion of this course, the students should be able to

- **CO1:** Acquire skill on application of Computer aided design software to design apparels and accessories.
- **CO2:** Acquire skill on application of Computer aided pattern drafting, grading software to draft and grade patterns of different apparels
- **CO3:** Acquire ability to create and manipulate marker plan

Pre Requisite :

- 1. U14FT*T*303 Basic Pattern Making and Adaptation
- 2. U14FTP501/601 Apparel Production Laboratory-I/II

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs	Programme Outcomes(POs)											
	PO	PO								PO		
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	S							S	Μ		
CO2	S	S							S	Μ		
CO3	S	S			S				S	Μ		

Course Assessment methods:

Direct	Indirect
Model Exams, Lab Exercises, End	Course End Survey
semester Exams	

LIST OF EXPERIMENTS:

- 1. Design a Children's wear including accessories.
- 2. Design a ladies party wear including accessories
- 3. Design a Men's Formal wear including accessories
- 4. Develop design, pattern, grading for children's wear Baby frock using a one way fabric of 38" and 42" width.
- 5. Develop design, pattern, grading for children's wear Rompers using a two-way fabric of 38" and 42" width.


- 6. Develop design, pattern, grading and marker plan for a Ladies top with fabric of 44" and 52"width. Calculate the marker efficiency.
- 7. Develop design, pattern and marker plan for a Men's Basic T shirt of 48" fabric width. Calculate the marker efficiency.
- 8. Develop design, pattern, and grading and marker plan for Men's Formal Trouser using fabric of 60" and 72" width. Calculate the marker efficiency.
- 9. Develop design, pattern, and grading and marker plan for Ladies Full Gown using fabric of 48" width. Calculate the marker efficiency.
- 10. Develop design, pattern, grading and marker plan for a Ladies Skirt using plaid fabric of 38" and 60" width. Calculate the marker efficiency.
- 11. Develop design, pattern, grading and marker plan for a Men's Full arm shirt using fabric of 60" and 72" width. Calculate the marker efficiency.
- 12. Develop design, pattern, grading and marker plan for Salwar Kameez using fabric of 60" and 72" width. Calculate the marker efficiency.

Experiments beyond the syllabus should be conducted

Total: 60 Hours

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U14ENP601

COMMUNICATION SKILLS LABORATORY

L	Т	Р	С
0	0	3	1

(Common to all branches of Engineering and Technology)

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Impart the role of communicative ability as one of the softskills needed for placement
- CO2: Develop communicative ability and softskills needed for placement
- **CO3:** Be Industry-Ready through inculcating team-playing capacity

Pre-requisite:

- 1. U14ENT101 Functional English I
- 2. U14ENT201 Functional English II

(S/M/W	CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1				Μ							Μ	
CO2				W						М	S	
CO3				S						W	S	

Course Assessment methods:

Direct	Indirect				
1. Presentation, Role Play, Mock	Course end survey				
interview, GD etc.					

GRAMMAR IN COMMUNICATION

9 Hours

Grammar and Usage – Building Blocks, Homonyms, Subject and Verb Agreement, Error Correction - Grammar Application, Framing Questions – Question words, Verbal Questions, Tags, Giving Replies –Types of Sentences, Listening Comprehension –Listening and Ear training

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ASSERTIVE COMMUNICATION

Listening Comprehension in Cross–Cultural Ambience, Telephonic Conversations/Etiquette, Role Play Activities, Dramatizing Situations-Extempore – Idioms and Phrases.

CORPORATE COMMUNICATION

Video Sensitizing, Communicative Courtesy – Interactions – Situational Conversations, Time Management, Stress Management Techniques, Verbal Reasoning, Current Affairs – E Mail Communication / Etiquette.

PUBLIC SPEAKING

Giving Seminars and Presentations, Nuances of Addressing a Gathering one to one/ one to a few/ one to many, Communication Process, Visual Aids & their Preparation, Accent Neutralization, Analyzing the Audience, Nonverbal Communication.

INTERVIEW & GD TECHNIQUES 9 Hours

Importance of Body Language –Gestures & Postures and Proxemics, Extempore, Facing the Interview Panel, Interview FAQs, Psychometric Tests and Stress Interviews, Introduction to GD, Mock GD Practices.

Practical : 45 Hours

REFERENCES

- Bhatnagar R.P. & Rahul Bhargava, "English for Competitive Examinations", Macmillian Publishers, India, 1989, ISBN: 9780333925591
- 2. Devadoss K. & Malathy P., "Career Skills for Engineers", National Book Publishers, Chennai, 2013.
- 3. Aggarwal R.S., "A Modern Approach to Verbal & Non–Verbal Reasoning", S.Chand Publishers, India, 2012, ISBN : 8121905516

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156

Total: 45 Hours

9 Hours elephonic

9 Hours

SEMESTER VII

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Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Acquire broad knowledge of the various industrial engineering methods and tools associated with manufacturing systems and human factors
- **CO2:** Demonstrate modern industrial engineering methods and scientific solutions to apparel manufacturing towards economic, environmental, and societal context
- **CO3:** Perform as industry leaders in the global marketplace, capable of successfully planning, controlling, and implementing large-scale projects
- **CO4:** Understand and apply the principles of science, technology, engineering, and maths involving industry-relevant problems.
- **CO5:** Acquire skills to investigate, experiment and solve problems in context with productivity improvement and material handling

Pre Requisite :

U14FT7401 Apparel Production Technology

U14FTT304 Garment components fabrication

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
Cos	Programme Outcomes(POs)											
	PO	РО	PO	РО	PO	PO						
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S									S		
CO2					S	S				S		М
CO3				М						S	S	
CO4	М			М								
CO5		М		М								

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

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INTRODUCTION:

Scope of industrial engineering in apparel Industry, role of industrial engineers.

Productivity: Definition - Productivity, Productivity measures, Reduction of work content due to the product and process, Reduction of ineffective time due to the management, due to the worker. Causes for low productivity in apparel industry and measures for improvement.

WORK STUDY:

Definition, Purpose, Basic procedure and techniques of work-study.

Work environment – Lighting, Ventilation, Climatic condition on productivity. Temperature control, humidity control, noise control measures. Safety and ergonomics on work station and work environment

Material Handling – Objectives, Classification and characteristics of material handling equipments, Specialized material handling equipments.

METHOD STUDY:

Definition, Objectives, Procedure, Process charts and symbols. Various charts – Charts indicating process sequence: Outline process chart, flow process chart (man type, material type and equipment type); Charts using time scale – multiple activity chart. Diagrams indicating movement – flow diagram, string diagram, cycle graph, chrono cycle graph, travel chart

MOTION STUDY: Principle of motion economy, Two handed process chart, micro motion analysis – therbligs, SIMO chart.

WORK MEASUREMENT:

Definition, purpose, procedure, equipments, techniques. Time study -Definition, basics of time study- equipments. Time study forms, Stop watch procedure. Predetermined motion time standards (PMTS). Time Study rating, calculation of standard time, Performance rating – relaxation and other allowances. Calculation of SAM for different garments, GSD.

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9 Hours

9 Hours

9 Hours

WORK STUDY APPLICATION:

Application of work study techniques in cutting, stitching and packing in garment industry. Workaids in sewing, Pitch diagram ,Line balancing, Capacity planning, scientific method of training.

Theory: 45 Hours

Total: 45 Hours

REFERENCES

- 1. Johnson Maurice "Introduction of Work Study", International Labour Organization, Geneva, 2005.
- 2. V.Ramesh Babu "Industrial Engineering in Apparel Production" Woodhead publishing India PVT ltd, 2012
- 3. Kiell B.Zandin, "Mayanard's Industrial Engineering Hand Book", Fifth edition, Mc Graw Hill, NewYork, 2001.
- 4. Savita Sharma, SK Sharma "Work Study And Ergonomics "S. K. Kataria & Sons (publishers) ISBN: 818845834, 2010
- 5. Khanna.O.P., "Industrial Engineering and Management", Danpat Rai and Sons,1987.
- 6. Ralph M. Barnes, "Motion and Time Study Design and Measurement of Work", 7th Edition, John Wiley and Sons, New York, 1980.
- 7. Khan.M.I., "Industrial Ergonomics", PHI LTD. Eastern Economy Edition, 2010.
- 8. Kantilla Ila, "Apparel Industry In India", Prentice Hall, 1990.
- 9. Rajesh Bheda, "Managing Productivity in Apparel Industry "CBS Publishers & Distributors, ISBN8123909217, 9788123909219, 2008.

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U14FTT702 SOCIAL COMPLIANCE FOR APPAREL INDUSTRY



Course Outcomes

After successful completion of this course, the students should be able to

CO1: Acquire knowledge on scope and need of social compliance

CO2: Understand the compliance norms on labour and safety

CO3: Understand the compliance norms on Health and Environment

CO4: Understand the norms on wage compliance

CO5: Comprehend practice of ethical trading and international compliance

Pre-requisites: NIL

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1					Μ							
CO2					Μ					Μ		
CO3					Μ					Μ		
CO4		S								М		
CO5		S								Μ		Μ

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	1. Course end Survey
End Semester Exam	

DEFINITION: SCOPE AND NEED OF SOCIAL COMPLIANCE:

9 Hours

Social Compliance - concept, need, benefits for industry, workers, society. Social accountability and Corporate Social responsibility - scope and need. Social Compliance in supply chain management.

GENERAL NORMS ON LABOUR AND SAFETY:

12 Hours

Conventions on discrimination, forced labour, child labour- Direction and risk in the supply chain. ILO convention on child labour, worst Form of

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child labour, Hazardous child labour, Environment and climate, health and safety – safety norms and measures to be enforced for safe working Environment., working hours- norms, remuneration-minimum wages Conventions on Acquired Immune Deficiency Syndrome (AIDS) and Gender.

HEALTH AND ENVIRONMENT COMPLIANCE: 8 Hours

Minimum age Convention, freedom of association, collective bargaining, corruption and bribery – effect and risk in the supply chain. Global Reporting Initiatives (GRI) sustainability reporting guide line. Organization for Economics Co- operation and Development (OECD) guide lines for multi national discrimination.

WAGE COMPLIANCE:

Freedom of association, collective bargaining agreements (C87, C98 – ILO) compensation – norms applicable in India. Working hours – code of conduct.

ETHICAL TRADING AND INTERNATIONAL COMPLIANCE:

Ethical Trading Initiative (ETI). Basic code of labour practice. World wide Responsible Apparel Production (WRAP) purposes, WRAP Principle, certification process, SA 8000. National and international regulating organizations – OSHA, WRAP, GOTS, OEKO TEX. Corporate Social Responsibility (CSR) – mandatory requirements – benefits to company, labour and society.

Theory : 45 Hours

REFERENCES

 Rajesh Chhabara, "Social Accountability", Ava softech Pvt. Ltd., 2005
Rebocak Leifziger, "SA 8000: The first decade", Greech Leaf Publishers, May 2009.

3.http://www.ilo.org.in.

4.http://www.endchildlabor.com



Total: 45 Hours

9 Hours

5.http://www.labour.nic.in

6.http://www.unicef.org

7.http://www.indianchild.com

8.http://www.paycheck.in

9.http://www.sa-intl.org.

10.http://www.saasaccreditation.org.

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U14FTT703 QUALITY ASSURANCE IN APPAREL PRODUCTION

L	T	P	С
3	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Acquire knowledge on the concepts of quality assurance, its importance in manufacturing process, and realizing the same through sampling-based inspection.
- **CO2:** Acquire knowledge on statistical tools, apply them for quality assurance, and compare the results with international standards for apparel products.
- **CO3:** Acquire knowledge on quality control of material and processes in apparel manufacturing through the use of tolerance limits and process standards.
- **CO4:** Understand and execute quality requirements of different standard organization.
- **CO5:** Control and manage quality requirements of customer, Buyer and Standards organization in Apparel Industry.

Pre Requisite :

- U14FT7401 Apparel Production Technology
- U14FT*T*603 Apparel production planning and control

	CO/PO Mapping											
(S/M/V	(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs	Programme Outcomes(POs)											
	PO	PO	РО	PO	РО	PO						
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	Μ			S						М	Μ	
CO2				S						М	Μ	
CO3	S			S	М			Μ		М	Μ	
CO4			S		S							
CO5				S	S							
CO2 CO3 CO4 CO5	S		S	S S S	M S S			M		M	M	

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course end Survey
End Semester Exam	

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INTRODUCTION

Quality definition – Quality control and its necessity. Quality assurance - difference between quality assurance and quality inspection. Inspection and importance - Functions of inspection – Types of inspection - 100% inspection, spot checking. Sampling - arbitrary sampling and statistical sampling. Comparison of 100% inspection and sample inspection. Systems of inspection – raw material inspection, in process inspection and final inspection – AQL

STATISTICALQUALITYCONTROLANDQUALITYMANAGEMENT9 Hours

Quality tools - Cause-and-effect diagram, Check sheet, Control chart, Histogram, Pareto chart, Scatter diagram and flow chart. Control charts and their application.

Quality Circles and Total Quality Management. Classification of defects – product defect, process defect. Grading visual defects. Defect zones in apparels.

INTERNATIONAL STANDARDS

Product Standards and Process standards - ISO, ASTM, BS, ANSI, ASA, BIS, ASQ, AATCC, GOTS, Oekotex. Specifications and standards for raw material, accessories, manufacturing process, testing and services. Standard performance specifications for women's, men's, children's wear – woven and knitted.

TYPES OF CONTROL DOCUMENTS

Raw material purchase and utilization, spreading, cutting, sewing and packing. Quality control for fabrics – different types of defects in fabrics – classification into major and minor faults – fabric inspection systems – 4 point, 10 point systems. Quality control in pattern making, marker planning, cutting, sewing and packing.

QUALITY CONTROL IN APPAREL PRODUCTION9 HoursTolerance limits and quality standard for fabric, cutting, sewing in garmentindustry. Tolerances and quality standard for finished garments. Quality



9 Hours

9 Hours

control of labels, buttons, zippers, fasteners. Quality control systems and standards for packing and packed goods. Quality cost analysis - Cost of quality – cost of conformance - cost of non-conformance.

Theory : 45 Hours

Total: 45 Hours

REFERENCES

- 1. Jacob Solinger, "Apparel Manufacturing Handbook", Prentice Hall, 1998
- 2. PradipV.Mehta, P.E, Satish K.Bharadwaj, "Managing Quality in Apparel Industry", Newage International (P) Ltd, Publishers, 2006
- 3. Sammel Eliou, "Production Planning and Control", Wiley Eastern Pvt. Ltd.2007
- 4. M.Mahajan, "Statistical Quality Control", DhanpatRai and Co. (P) Ltd, 2007
- 5. Billie J. Collier, Helen H. Epps, "Textile Testing and Analysis", Prentice Hall, New Jersey, 1999
- 6. Mario Bona, "Textile Quality" Texilia, 1994.

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U14FTT704 COSTING IN APPAREL INDUSTRY

L T P C 3 1 0 4

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Acquire knowledge in basic principles of cost accounting

CO2: Describe the factors that determine the cost of apparel products

CO3: Apply knowledge in textile raw materials (yarn and fabric), accessories and manufacturing methods to derive the cost of basic apparel products

CO4: Acquire knowledge in financial management in apparel industry

CO5: Acquire knowledge in budgeting process in apparel industry

Pre Requisite :

U14FTT201 Fiber Science and Yarn Technology

U14FTT202 Weaving Technology

U14FTT302 Knitting Technology

U14FTT304 Garment Components Fabrication

U14FTT401 Apparel Production Technology

U14FTT504 Textile Chemical Processing

U14FT*T*604 Apparel Finishing and Care

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	Р
	1	2	3	4	5	6	7	8	9	10	11	O1
												2
CO1	S	S								S	S	
CO2		S					S				S	
CO3	S	S		S							S	S
CO4		S									S	S
CO5		S							S		S	

Course Assessment methods:

Direct	Indirect					
Internal tests(I, II, III), Assignment,	Course End Survey					
Tutorial,						
End Semester Exam						

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COST ACCOUNTING

Objectives- responsibility of accounting, uses of cost accounting. Elements of cost. Direct material, Direct labour, Factory over head. Cost behavior patterns in apparel industry. Fixed variable, semi variable. Estimating and costing- importance- difference between estimating and costing

RAW MATERIAL AND CMT COST:

Factors that determine the cost of garments – material cost – cost of yarn, cost of fabric production, cost of processing. Width, design and lot size of fabric affecting cost.

Different types of accessories used in garments and their cost -Thread, Button, Zippers, Interlining etc. Packing and labeling cost – different types of labels and packing materials.

Cost of components – cutting cost – making and trim cost (CMT cost) – CMT cost for different types of garments. Shipment cost.

GARMENT PRICING:

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.

COST VOLUME PROFIT ANALYSIS:

Break even analysis. Profit and loss statement, Balance sheet. Ratio analysis. Sales mix by garment style. Effect of volume change. Price / volume analysis. Depreciation- Calculation of depreciation.

BUDGETING FOR APPAREL INDUSTRY: 8 Hours

Budgeting principles for the apparel industry, fixed vs. flexible budget, master budget, limitations of budgets.

Theory: 45 Hours

Tutorial: 15 Hours

Total: 60 Hours

10 Hours

10+5 Hours

9+8 Hours

8 +2 Hours

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REFERENCES

- 1. Maurice Johnson and E. Moore, "Apparel Product Development", Om Book Service, 2001.
- 2. B.M.Lall Nigam and I.C.Jain "Cost Accounting Principles and Practice", Prentice Hall of India, 2007.
- 3. M.Y.Khan and P.K.Jain "Cost Accounting", Hill publishing Ltd., New Delhi, 2007.
- 4. Ruth E.Glock and Grace I. Kunz, "Apparel Manufacturing Sewn Product Analysis", Dorling Kindersley (India) Pvt. Ltd., 2005.
- 5. Chakraborty S K, "Cost Accounting and Financial Management", New age International, 2004.
- 6. Pandey I M, "Management Accounting", Vikas Publishing House, New Delhi, 1999.

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U14FTT705 APPAREL EXPORT MANAGEMENT

Course Outcomes



After successful completion of this course, the students should be able to

- **CO1:** Acquire knowledge on need for exports and export trade statistics.
- **CO2:** Understand steps involved in setting up export business and acquire knowledge on export correspondence and negotiation
- **CO3:** Acquire knowledge on EXIM policy and export promotion schemes
- **CO4:** Demonstrate understanding of export finance and payment terms
- CO5: Demonstrate knowledge in export documentation and procedures

Pre Requisite : NIL

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	Μ									Μ		
CO2	S									Μ	S	
CO3	Μ									Μ		
CO4	Μ									Μ		
CO5	S									Μ		

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

INTRODUCTION TO INTERNATIONAL TRADE: 12 Hours Basics of international trade and its significance. Role of WTO and regional economic groups in international trade. International trade statistics of textiles and apparel. Prospects for Indian apparel exports and SWOT analysis.

EXPORT BUSINESS:

Setting up of export business - export marketing organisation, product planning for export markets, export pricing and costing,



8 Hours

171

International Commercial (Inco) Terms. Export correspondence - negotiations for export business.

EXIM POLICY:

High lights of Exim Policy 2008 – 2013. Various schemes for export promotion - duty drawback, duty exemption, duty remission. EOU, free trade zones, special economic zones, market access initiative, market development assistance, brand promotion, trading house, export houses and ware housing zones.

EXPORT FINANCE:

Basic concepts of foreign exchange – foreign exchange risk management -Forfeiting and Factoring. Methods of International Payment Settlement -International Commercial Terms - Letter of Credit - Exchange Control Regulations for imports and exports - Export Financing - Pre-Shipment finance - Post Shipment Finance - EXIM Bank of India - ECGC - Demand Guarantees and Standby Letter of Credit.

EXPORT PROCEDURE AND DOCUMENTATION: 9 Hours

Export Procedure, Inspection and Customs Clearance procedures. Shipping formalities. Export Documentation - types - transport documents, commercial documents and regulatory documents. Marine Insurance General Information on Shipping - Types of Containers -Containerization - Air Transportation. Export Packaging - Introduction -Mechanical tests - Climatic tests - International Care labeling.

Negotiation of documents and realization of export proceeds, procedure for obtaining various export incentives.

Theory : 45 Hours

REFERENCES

- 1. Balagopal T A S, "Export Marketing", Himalayan Publishing House, 2005.
- 2. Francis Cherunilam, 'International Trade and Export Management' HPH, 2004



8 Hours

8 Hours

Total: 45 Hours

- 3. Govt. of India's, "Foreign Trade Policy", 2007.
- 4. D.C. Kapoor, Export Management, Vikas Publications, 2009
- 5. Palle Krishna Rao, "WTO Text and Cases Excel Series", Excel Books 2005.
- 6. Hearle J W S, Hines T and Suh M, "Global Marketing of Textiles", Journal of The Textile Institute (Special Issue) 1997.
- 7. "Globalization: Technological, Economic and Environmental Imperatives", The Textile Institute, 1995.
- 8. P.K.Khurana, "Export Management", Galgotia Publishsing Company, 2003.

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U14FTP701 APPAREL QUALITY EVALUATION LABORATORY

L	Т	P	С
0	0	4	2

Course Outcomes

After successful completion of this course, the students should be able to

- CO1: Acquire knowledge in basic principles of working of testing instruments
- **CO2:** Develop skills in preparing samples for various types of experiments and to conduct experiments.
- CO3: Analyze and interpret the data obtained from the testing instruments
- **CO4:** Conclude based on the standards and present the results

Pre Requisite :

1. U14FTT505 Textile and Apparel Quality Evaluation

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs	Programme Outcomes(POs)											
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S											
CO2		S		S								
CO3		S		S								
CO4				S						Μ		

Course Assessment methods:

Direct	Indirect
Model Exams, Lab Exercises, End	Course End Survey
semester Exams	

LIST OF EXPERIMENTS:

- 1. Determination of Seam Strength and Seam Slippage
- 2. Determination of Zipper strength
- 3. Determination of Button Pull Strength
- 4. Determination of Peel bond strength of fusible interlinings
- 5. Determination of Wickability of fabric
- 6. Determination of Spirality and Course length of Knitted fabrics
- 7. Classification of Fabric defects and evaluation using 4 point system.



- 8. Determination of Wettability of fabrics.
- 9. Analysis of garment defects and classification into minor, major and critical defects.
- 10. Analysis of Seam puckers.
- 11. Determination of garment dimensional stability.
- 12. Color measurement of fabrics with computerized colour matching.

Experiments beyond the syllabus should be conducted

Total: 60 Hours

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U14FTP702

L	Τ	P	С
0	0	4	2

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:**Interpret and relate the published fashion forecasts to design apparels based on a concept
- CO2: Create apparel designs based on requirements
- **CO3:**Develop documents and design sheets to enable effective communication in the apparel industry
- **CO4:**Select the suitable raw materials, garment trims & accessories and other garment details based on the garment requirements and develop garments
- **CO5:** Estimate the Garment costing based on the sample developed

Pre Requisite :

Relevant courses

	CO/PO Mapping											
(S/M/W	(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs				Pro	ogram	me O	utcon	nes(PO	Os)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	1 2 3 4 5 6 7 8 9 10 11 12									12	
CO1				S								
CO2			S		S						S	
CO3		S S S										
CO4		S									S	
CO5											Μ	

Course Assessment methods:

Direct	Indirect
Model Exams, Lab Exercises, End	Course end survey
semester Exams	

GUIDELINES:

The following have to be prepared:

- 1. Design Research
- 2. Conceptualization

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- 3. Client profile.
- 4. Theme board
- 5. Color board
- 6. Forecast board
- 7. Sourcing Board Fabrics
- 8. Sourcing Board Trims
- 9. Pattern (doodle) development board
- 10. Fashion design presentation board 5 nos.
- 11. Product development One men's wear,
- 12. Product development one women's wear

Experiments beyond the syllabus should be conducted.

Total: 60 Hours

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ELECTIVE I

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U14FTE101

L	Τ	P	С
3	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Acquire knowledge on types of camera, working principles of camera and their various accessories.
- **CO2:** Define knowledge on various camera techniques such as basic techniques, equipment techniques and subject techniques.
- **CO3:** Ability to identify the importance of lighting, types of lighting, film types, film speed, film format.
- CO4: Acquire skills on fashion photography in different fields.
- **CO5:** Acquire knowledge on developing and printing, image mixing and printing, computer application in photography and video photography.

Pre Requisite: Nil

	.CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs				Pro	gram	me O	utcom	les(PC)s)			
	PO	PO	PO	РО	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	S	Μ									
CO2	S	S	Μ									
CO3	S	Μ	S									
CO4		S M										
CO5	S	S	Μ		Μ							

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

INTRODUCTION:

9 Hours

Camera types – 35mm, SLR, Digital camera. Working principle of camera. Accessories: general accessories - lenses, lens filters, film types, flashlights- lighting accessories - power accessories, system accessories. Care and maintenance of camera.

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TECHNIQUES:

Camera techniques: Basic techniques - fundamentals of composition, depth of field, shutter speed, focusing, using exposures. Equipment techniques – filter techniques, lens techniques, flash techniques, studio flash techniques, lighting techniques. Subject techniques landscape, night photography, portrait, action photography and special effects. Outdoor and Indoor Photography – equipments.

LIGHTING AND FILM:

Lighting – concept and importance – Types of lighting – front light, side light, back light, revealing light, controlling light, flash and studio lighting. Film types – Black and White, Colour. Film speed- Film format.

SUBJECT PHOTOGRAPHY:

Fashion Photography in different media - modeling, newspaper, magazines and fashion shows. Concept/theme based photography along with its application and acceptability in marketing and commercialization/branding.

DEVELOPING AND PRINTING:

Basics of developing and printing – image mixing and printing – Latest developments in printing – Computer application in photography. Video photography

Theory : 45 Hours

REFERENCES

- 1. Nirmal Pasricha, "A Professional's Basic Photography", Black Rose Publications, Delhi, 2002.
- 2. Daniel Lezano, "The Photography Bible", A David and Charles Book., United Kingdom, 2004.
- 3. Simon Joinson, "Get the most from your Digital Camera", A David and Charles Book., United Kingdom, 2004.
- 4. Miller, W.R. "Basic Industrial Arts, Plastics, Graphic Arts.



12 Hours

9 Hours

9 Hours

Total: 45 Hours

6 Hours

Photography", McKnight Publishing company, Illinois, 1978.

- 5. John Hedge, "Photography Course", John Hedge Co, 1992.
- 6. Steve Bavister, "35 mm Photography -The Complete Guide", A David and Charles Book., United Kingdom, 2004.
- 7. Peter Cattrell, "Photography", Octopus Publishing Group Ltd, London 2005.
- 8. Sue Hillyard, "The Photography Handbook A Step by Step Guide", New Holland Publishers, London, 2003.

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U14FTE102

L	Т	Р	С
3	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:**Define and appreciate the significance and role of visual merchandising in a retail environment, in order to effectively present the merchandise to the consumers
- **CO2:** Classify the various elements of Visual presentation and understand their significance in visually presenting a display`
- **CO3:**Analyze and identify the best suitable environment for a merchandise including interior, exterior and point of displays
- **CO4:** Acquire knowledge on various techniques used in presenting and optimizing the merchandise and retail space to customers.
- **CO5:** Acquire knowledge on the various features available in a computer controlled visual merchandising

Pre Requisite :

U14FTT301 Concepts of Fashion and Design

U14FTP401 Fashion Design Laboratory-II

CO/PO Mapping												
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO										
	1	2	3	4	5	6	7	8	9	10	11	12
CO1		S										
CO2		S								S		
CO3		S								S		
CO4			S									
CO5					Μ							

Course Assessment methods:

Direct	Indirect					
Internal tests(I, II, III), Assignment,	Course end survey					
End Semester Exam						

FUNDAMENTALS OF VISUAL MERCHANDISING: 9 Hours Visual Merchandising - definition, objectives and scope. Types of display and display settings. Retail stores and approaches of visual



merchandising -Types of retail stores, store atmospherics, Approaches in Visual Merchandising in various stores- In house staffing, Department Store Approach, Small Store Approach. Role of Visual Merchandising in changing face of retailing.

ELEMENTS OF VISUAL PRESENTATION: 5 Hours

Overview of the various elements – Color, lighting, line and composition, graphics and signage, store exteriors and interiors, sensory stimulants like scent, sound etc. Application of color schemes and color psychology to create mood in garment display.

MANNEQUINS AND FIXTURES

Mannequins and other human forms, alternatives to mannequins. Criteria for selection of fixtures, dressing fixtures, modular fixtures. Store exterior - Signs, Marquees, Outdoor Lighting, Banners, Planters, Awnings, Windows in Storefront Design, store fronts.

STORE INTERIORS AND POINTS OF DISPLAY: 5 Hours

Focal points, island displays, risers and platforms, the runway the catwalk, counters and display cases, museum cases, demonstration cubes, ledges, shadow boxes, enclosed displays, fascia, t-walls. Point of purchase display, industrial display, fashion shows, trade organizations and sources.

DISPLAY TECHNIQUES

Attention getting devices, familiar symbols, masking and proscenia – purpose and techniques used

STORE PLANNING AND EXECUTION OF A VISUAL PRESENTATION **10 Hours**

Store layout planning- grid, race track, freeform and their direction of flow. Floor plans and reading of floor plans - Plan-o-gram- definition, purpose and planning - theme, ensemble, racks, shelves, bins, etc. planning- Assortment planning, Assortment Optimize apparel assortments Display calendar and planning a display, scheduling the promotion, budgeting and safety factors in visual merchandising.



182

5 Hours

COMPUTER AIDED VISUAL MERCHANDISING: 5 Hours CAD in store design, Information technology in assortment planning and inventory management.

Theory : 45 Hours

Total: 45 Hours

REFERENCES

- 1. Pegler M.M., "Visual Merchandising and Display", IV Edition, Fair child Publications, New York, 2001.
- 2. Diamond. J, Diamond, E., "Contemporary Visual Merchandising", Prentice Hall Inc. New Jersey 2003.
- 3. Diamond. E, Fashion Retailing A Multi channel Approach, II Edition, Prentice Hall Inc. New Jersey 2006.
- 4. Rath P.M., Peterson J., Greensley.P, Gill.P, Introduction to Fashion Merchandising, Delmar Publishers Inc., New York 1994.
- 5. Phillips P.M., Fashion Sales Promotion, II Edition, Prentice Hall Inc, New Jersey, 1996.
- 6. Curtis E, Fashion Retail, John Wiley and Sons Ltd, England, 2004

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U14FTE103 GARMENT TRIMS AND ACCESSORIES



Course Outcomes

After successful completion of this course, the students should be able to

- CO1: Acquire knowledge in the fundamentals of garment trims and accessories
- **CO2:** Develop an understanding of the types and characteristics of primary trims
- CO3: Gain knowledge on the types and characteristics of secondary trims
- **CO4:** Recognize and identify the types and characteristics of packing and finishing accessories
- **CO5:** Understand the importance of performance and testing of garment trims and accessories

Pre Requisite:

U14FT*T*401 Apparel Production Technology

U14FTT501 Fashion Apparel Design and Development

CO/PO Mapping												
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	РО	PO	PO	PO	PO	РО	PO	РО	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S					Μ	М					
CO2	S	Μ										
CO3	S	Μ	М									
CO4	Μ					Μ	Μ					
CO5	S	Μ				S	S					

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

INTRODUCTION:

9 Hours

Meaning, importance, classification, Factors affecting selection of raw materials, types of finishes for trims and accessories, importance of certification of trims and accessories in exports

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PRIMARY TRIMS:

Linings-fibre types and properties- factors affecting selection of liningsmaking up and testing of linings – lining component patterns;

Interlinings- fusible and non fusible -woven and non woven -types chemical bonded, thermal bonded, needle bonded, spun bonded, embroidery backing, water soluble fabrics, Tricot lining, Coat lining, Mobilone tape, Felts. Wadding or batting – types and characteristics

SECONDARY TRIMS:

Closures (buttons, hooks and eyes, hooks and bars, press studs, rivets, zips, velcro), shoulder pads, tapes; Ornamental Trims- laces, braids, elastic, fringes, tassels, appliqués, transfer prints, tie cords, labels and motifs

PACKING AND FINISHING ACCESSORIES: 9 Hours

Types of package forms – merchandise packaging and shipping packaging, Types of packaging materials - raw materials - Poly bags, collar accessories and backing boards, Quality specification for packaging materials – fitness certification for end use and bursting strength (ASTM Standards), Packing and shipping equipment – folding equipment, container packing equipment and conveyors.

PERFORMANCE AND TESTING:

Performance properties of components and trims - Standards and certification for trims and accessories- Buttons (BS 4162 and ASTM D5171), Snap Fasteners(ASTM D4846) Zipper (BS3084, ASTM D2061, AS 2332), Elastics (ASTM D4964 and EN 14704 Part 3), Safety tests (BS 7907, EN 71-1, 16 CFR 1501 (16 CFR.1500.51,52and53), Attached components/trims/Motifs/prints -Durability to washing – ISO 6330, Tests for nickel free and lead free trims and accessories.

Theory : 45 Hours

REFERENCES

- 1. Harold Carr and Barbara Latham- Technology of Clothing Manufacture-Blackwell Science Inc. USA., 2002
- Solinger, "Apparel Production Handbook", 2. Jacob Reinhold Publications, 1998.

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9 Hours

9 Hours

Total: 45 Hours

- 3. Gerry Cooklin Garment Technology for Fashion Designers, Black well science Ltd. USA., 2011
- 4. Jarnow.J.A.and Judelle.B Inside the fashion business, 2nd edition, 2002
- 5. ASTM Standards en.wikipedia.org/wiki/ASTM International
- 6. ISO Standards- www.iso.org/iso/iso catalogue.htm

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U14CST901 OBJECT ORIENTED PROGRAMMING USING C++

L	Τ	Р	С		
3	0	0	3		

(Common to EEE, EIE & FT)

Course Outcomes (COs):

After successful completion of this course, the students should be able to

CO1: Define principles of object oriented programming.

- CO2: Explain about class, object concepts.
- CO3: Outline the concept of operator overloading
- CO4: Utilize various inheritance concepts to develop applications

CO5: Make use of virtual function concepts to develop applications

Pre-requisite Courses: Nil

CO/PO Mapping												
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	М											
CO2	М											
CO3		S										
C04	М	S	М									
CO5	М	M	Μ									

Course Assessment methods:

Direct	Indirect
Internal Tests, Assignments,	Course End Survey
Seminar, End semester Exam	

INTRODUCTION

10 Hours

Object Oriented Paradigm, Data Types, Operators and Expressions,Control Flow- Arrays and Strings, Modular Programming with FunctionsCLASSES AND OBJECTS9 Hours

Introduction-Class Specification-Class objects--Outside member functions as inline-Data hiding-Passing object as arguments-Returning Objects from



functions-friend functions and friend class-Constant parameters and member functions-Structures and classes-Static Data and member functions-Object initialization-Constructor-Parameterized constructor-Destructor-Constructor Overloading-Constructor with default arguments-Copy constructor-Constant object and constructor-Static data members with constructor and destructor

OPERATOR OVERLOADING

Introduction- Overloadable operators-Unary operator overloading-operator keyword-operator return values-Nameless temporary objects-Limitations of Increment/Decrement operators-Binary operator overloading-Arithmetic operators-Concatenation of strings-comparison operatorsarithmetic assignment operators-overloading of new and delete operators-Data conversion- conversion between basic data types-Conversion between objects and basic Types-Conversion between objects of different classes-Subscript operator overloading-overloading with friend functions-Assignment operator overloading

INHERITANCE

Introduction-Class revisited- Derived class declaration-Forms of inheritance- Inheritance and member accessibility-Constructors in derived classes-Destructors in derived classes-Constructor invocation and data member initialization-overloaded member function-Abstract classes-Multilevel inheritance-Multiple inheritance-Hierarchical inheritance-Multipath inheritance and virtual base class-Hybrid inheritance-object composition-Benefits of inheritance.

VIRTUAL FUNCTIONS

Introduction-Need for Virtual function-Pointer to derived class objectsdefinition of virtual functions-Array of pointers to base class objects-Pure virtual functions-Abstract classes-Virtual destructors-Rules for virtual functions.

Theory:45 Hours

Total : 45 Hours

Thomas

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188

8 Hours

8 Hours

References:

- 1. K.R.Venugopal, Rajkumar Buyya, "Mastering C++", TMH, 2013.
- 2. Bjarne Stroustrup, "The C++ programming language", Addison Wesley, Fourth Edition, 2013.
- 3. E.Balagurusamy, "Object Oriented Programming with C++", Fifth Edition, TMH Second Edition, 2011.
- 4. Robert Lafore, "Object Oriented Programming in C++", Galgotia publications pvt Ltd, Third edition, 2000

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ELECTIVE II

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L	Τ	Р	С
3	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:**Acquire knowledge on basic principles in designing and types of inner wear garment and fabrics for intimate apparel.
- **CO2:**Developing skills in preparation of intimate men's and women's garments by various measurements, pattern development and construction methods.
- **CO3:** Relate the suitability of accessories and other construction methods of producing intimate apparels.
- **CO4:** Acquire knowledge on basics principles of Intimate apparels
- **CO5:**Analyze the effect of performance evaluation factor on Intimate apparels.

Pre Requisite :

U14FT*T*303 Basic Pattern Making and Adaptation U14FT*T*501 Fashion Apparel Design and Development

(S/M/W	CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											Veak
COs				Pro	ogram	me O	utcom	nes(PC	Ds)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S											
CO2		S	Μ									
CO3	Μ		W									
CO4												
CO5			S	S	Μ							

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

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INTIMATE APPAREL:

Definition-Types- Night Wear, Under Wear, Classification of Kid's, Women's and Men's Intimates. Quality requirements for selecting suitable fibers, fabrics, designs for intimate apparels. Physical and physiological health effect of Intimate apparel. Latest finishes for intimate apparels

MEN'S INTIMATE APPARELS :

Introduction, Design and development- measurements - Step by step drafting procedure and construction sequence - vests, briefs, trunk, pyjama and bathrobe.

WOMEN'S INTIMATE APPAREL:

Introduction, Design and development - measurements - Step by step drafting procedure and construction sequence - waist petticoat, bra, panty, camisole, night dress, negligee

INTIMATE APPAREL ACCESSORIES: 3 Hours

Accessories - bra wire, hook and eye tape, ring and slider, buckle, plastic bone, Elastics, Threads etc. used for intimate apparel.

INTIMATE APPAREL PRODUCTION TECHNOLOGY: 6 Hours Principles, methods, technical aspects and controls of lamination, moulding and seamless knitting technology for production of intimate apparels.

PERFORMANCE EVALUATION OF INTIMATE APPAREL:

9 Hours

Functional Requirements – comfort – sewability – appearance retention – durability - after care

Performance Evaluation - thermal properties - moisture permeability liquid transport properties - low stress mechanical properties dimensional stability & skewness stability – colour fastness – wearer trials Requirements for engineering intimate apparels – Fibre & yarn characteristics, fabric composition, thickness structure.

Theory : 45 Hours

Total: 45 Hours

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9 Hours

9 Hours

REFERENCES

- 1. W. Yu, J. Fan, S.C. Harlock, S.P. Ng "Innovation and Technology of Women's Intimate Apparel", Woodhead Publishing Ltd., England, 2006.
- 2. Ann Haggar, "Pattern Cutting For Lingerie, Beach Wear And Leisure Wear", Black Well Science Ltd., France, 2001.
- 3. Lynn Nottage, "Intimate Apparel / Fabulation", Theatre Communications Group, USA, 2006.
- 4. Stokes Terry, "Intimate Apparel", Brooklyn: Release Press, USA, 1980.
- 5. Singer, "Sewing Lingerie", Cy Decosse Incorporated, Mexico, 1991.

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HOME FURNISHINGS

L	Τ	Р	С
3	0	0	3

U14FTE202

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Acquire knowledge about the varieties of home furnishing materials and finishing methods
- **CO2:** Develop skills in the selection of different varieties of home furnishing materials in terms of sizes, shapes and patterns and construction methods.
- **CO3:** Trace the knowledge on suitability of home furnishing linens for different end use
- **CO4:**Trace the knowledge on suitable washing method, care & maintenance of home furnishing materials.
- CO5: Assess the varieties of home furnishing products and its end uses.

Pre Requisite : Nil

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs				Pre	ogram	nme O	utcon	nes(P	Os)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	1 2 3 4 5 6 7 8 9 10 11 12										
CO1	Μ											
CO2		S	Μ									
CO3	Μ	Μ										
CO4		M										
CO5			Μ									

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

INTRODUCTION

Introduction of Textile Furnishing - definition – different type of furnishing materials – Woven and non-woven – Factors affecting selection of home furnishing – fibre, fabric and value added finishing for home furnishings - soil repellency, mosquito repellency, flame proofing, dust repellency, antimicrobial finish.



9 Hours

194

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WINDOW TREATMENT

Doors and Windows – types. Window Treatment – exterior, interior -hard and soft. Curtains and Draperies – types, parts, factors for selection and construction, accessories used.

LIVING ROOM FURNISHING

Living Room furnishings - sofa Cover, cushion, cushion cover, bolster, bolster cover, teapoy cover and Wall coverings – types.

FLOOR COVERING

Floor covering - types - Hard floor covering, resilient floor coverings, soft floor coverings - carpet, rugs, mats.

BED AND BATH LINEN

Bed linens – types – bed sheets, blankets, blanket covers, comforters, comforter covers, bed spreads, mattress and mattress covers, pads, pillows and pillow covers. Care and Maintenance of bed linen. Bath linen –types - towel, mats. Care and maintenance of bath linen.

KITCHEN LINEN

Kitchen linens – types - dish cloth, towels, fridge cover, fridge handle cover, mixie cover, and grinder cover, napkin, apron.

TABLE LINEN

Table Linen – Types - table mats, table cloth, hand towel, doilies, runners. Cleaning materials – wipes and mops. Care and maintenance of kitchen and table linen.

Theory : 45 Hours

REFERENCES

- 1. Jay Diamond and Ellen Diamond, "Fashion Apparel, Accessories, Home Furnishings", Pearson Prentice Hall, New Jersey, 2007.
- 2. Hamlym, "Bed and Table linen", Octopus Publishing Group Ltd, Newyork, 2001.
- 3. David Holloway, "The Essential Book of Home Improvement Techniques", Marshals Publications, London, 2000.
- 4. Emma Callery, "The Home Decorator's Colour Source Book",

5 Hours

9 Hours

4 Hours

5 Hours

195

Total: 45 Hours

9 Hours

Apple Press Ltd, London, 2006.

- 5. Heather Luke, "Design and Make Cushions", Silverdale Books Ltd, Leicester, 2001.
- 6. Hamlym, "Curtains and Blinds", Octopus Publishing Group Ltd, Newyork, 2001.
- 7. Susie Johns, "A Cornucopia of Cushions", Apple Press Ltd, London, 1997.
- 8. James Merrell, "Living with Decorative Textiles ", Thames and Hudson ltd, London, 1995.
- 9. Caroline Lebea, "Fabrics The Decorative Art of Textiles", Thames and Hudson Ltd, London, 1994.

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U14GST003 PRINCIPLES OF MANAGEMENT Course Outcomes

L	Τ	Р	С
3	0	0	3

After successful completion of this course, the students should be able to

- **CO1:** Understand the concepts of management, administration and the evolution of management thoughts.
- **CO2:** Understand and apply the planning concepts.
- **CO3:** Analyze the different organizational structures and understand the staffing process.
- **CO4:** Analyze the various motivational and leadership theories and understand the communication and controlling processes.

CO5: Understand the various international approaches to management

Pre Requisite :

Relevant Courses

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs				Pro	ogram	me O	utcon	nes(PO	Os)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	1 2 3 4 5 6 7 8 9 10 11 12									12	
CO1									S			
CO2						S						
CO3									S	S		
CO4									S			
CO5						S						

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course –End Surveys
End Semester Exam	

MANAGEMENT CONTEXT

Management – Definition – Importance – Functions – Skills required for managers - Roles and functions of managers – Science and Art of Management –Management and Administration.

Evolution of Classical, Behavioral and Contemporary management thoughts.

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PLANNING

Nature & Purpose – Steps involved in Planning – Forms of Planning – Types of plans – Plans at Individual, Department and Organization level -Managing by Objectives. Forecasting – Purpose – Steps and techniques. Decision-making – Steps in decision making.

ORGANISING

Nature and Purpose of Organizing - Types of Business Organization -Formal and informal organization – Organization Chart – Structure and Process – Strategies of Departmentation– Line and Staff authority – Benefits and Limitations. Centralization Vs De-Centralization and Delegation of Authority. Staffing – Manpower Planning – Recruitment – Selection – Placement – Induction.

DIRECTING & CONTROLLING

Nature & Purpose – Manager Vs. Leader - Motivation - Theories and Techniques of Motivation.

Leadership - Styles and theories of Leadership.

Communication – Process – Types – Barriers – Improving effectiveness in Communication.

Controlling – Nature – Significance – Tools and Techniques.

CONTEMPORARY ISSUES IN MANAGEMENT 9 Hours

Corporate Governance Social responsibilities – Ethics in business – Recent issues.

American approach to Management, Japanese approach to Management, Chinese approach to Management and Indian approach to Management.

Theory : 45 Hours

REFERENCES

- 1. Tripathy PC and Reddy PN, "Principles of Management", Tata McGraw-Hill, 4th Edition, 2008.
- 2. Dinkar Pagare, "Principles of Management", Sultan Chand & Sons, 2000.



9 Hours

9 Hours

198

Total: 45 Hours

- Kanagasapapathi. P, Indian Models of Economy, Business and Management, Prentice Hall of India, New Delhi, ISBN: 978-81-203-3423-6, 2008
- 4. G.K.Vijayaraghavan and M.Sivakumar, "Principles of Management", Lakshmi Publications, 5th Edition, 2009.
- 5. Harold Koontz & Heinz Weihrich, "Essentials of Management An International perspective", 8th edition. Tata McGraw-Hill, 2009.
- 6. Charles W.L. Hill and Steven L McShane Principles of Management, Tata Mc Graw-Hill, 2009.

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U14GST004



Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Apply linear programming model and assignment model to domain specific situations
- **CO2:** Analyze the various methods under transportation model and apply the model for testing the closeness of their results to optimal results
- **CO3:** Apply the concepts of PERT and CPM for decision making and optimally managing projects
- **CO4:** Analyze the various replacement and sequencing models and apply them for arriving at optimal decisions
- **CO5:** Analyze the inventory and queuing theories and apply them in domain specific situations.

Pre Requisite : Nil

	CO/PO Mapping											
(S/M/W	(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs				Pro	gram	me Oi	utcom	es(PC)s)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	М										
CO2	Μ				W							
CO3			Μ	Μ								
CO4		Μ		Μ								
CO5	S		W									

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

Course Content LINEAR MODEL

The phases of OR study – formation of an L.P model – graphical solution – simplex algorithm – artificial variables technique (Big M method, two phase method), duality in simplex.

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TRANSPORTATION AND ASSIGNMENT MODELS 9 Hours

Transportation model - Initial solution by North West corner method least cost method - VAM. Optimality test - MODI method and stepping stone method.

Assignment model – formulation – balanced and unbalanced assignment problems.

PROJECT MANAGEMENT BY PERT & CPM 9 Hours Basic terminologies – Constructing a project network – Scheduling computations – PERT - CPM – Resource smoothening, Resource leveling, PERT cost.

REPLACEMENT AND SEQUENCING MODELS Replacement policies - Replacement of items that deteriorate with time (value of money not changing with time) - Replacement of items that deteriorate with time (Value of money changing with time) - Replacement of items that fail suddenly (individual and group replacement policies). Sequencing models- n jobs on 2 machines - n jobs on 3 machines - n jobs on m machines, Traveling salesman problem.

INVENTORY AND QUEUING THEORY

Variables in inventory problems, EOQ, deterministic inventory models, order quantity with price break, techniques in inventory management. Queuing system and its structure – Kendall's notation – Common queuing models - M/M/1: FCFS/ ∞/∞ - M/M/1: FCFS/n/ ∞ - M/M/C: FCFS/ ∞/∞ -M/M/1: FCFS/n/m

Theory : 45 Hours

REFERENCES

- 1. Taha H.A., "Operation Research", Pearson Education, 2008
- 2. Hira and Gupta "Introduction to Operations Research", S.Chand and Co.2002
- 3. Hira and Gupta "Problems in Operations Research", S.Chand and Co.2008
- 4. Wagner, "Operations Research", Prentice Hall of India, 2000
- 5. S.Bhaskar, "Operations Research", Anuradha Agencies, Second Edition, 2004

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Total: 45 Hours

9 Hours

ELECTIVE III

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L	Т	Р	С
3	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Appreciate the significance of fashion communication, theories of clothes and their impact on society
- CO2: Describe a market according to its size, structure and market environment
- **CO3:** Demonstrate knowledge on designing appropriate marketing research, collect data and analyze data to interpret the required data from the market
- CO4: Describe the types and process of fashion forecasting
- **CO5:** Understand the significance and classification of fashion products and new product development and marketing communication strategy

Pre Requisite :

U14FT7601 Apparel Product Development U14FT7602 Apparel Merchandising

	CO/PO Mapping											
(S/M/W	(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs				Pro	ogram	me O	utcon	nes(PC	Ds)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1		S								S		
CO2		S										
CO3			S	Μ					S			
CO4				S								
CO5		Μ								S		

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	1. Course-end survey
End Semester Exam	

FASHION COMMUNICATION

9 Hours

Fashion and Anti fashion, Function of Fashion Clothing - Material

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function – protection, modesty and concealment, immodesty and attraction. Cultural functions - individuality expressions, social status, social role, economic status, political status, religious status.

FASHION AND SOCIETY

9 Hours

Fashion and modernity, fashion and post modernity, masquerade and allegory, fashion and pastiche, fashion and bricolage, fashion fashion and ambivalence.

INTRODUCTION TO FASHION MARKETING 5 Hours

Definition of Fashion-Fashion marketing - Development of Fashion market – Size, Structure – marketing environment - micro marketing, macro marketing environment.

FASHION MARKETING RESEARCH

Purpose of research -research design and data sources - Sampling methods – probability sampling, non probability sampling. Data sources, Primary data collection methods. Market Segmentation -Fashion marketing mix.

FASHION FORECASTING:

Definition of fashion forecasting, Types of forecasting – long term and short term, Process of fashion forecasting, Role of fashion forecasters, fashion forecasting packages – hard copy and soft copy packages – Trend stop, Trend union, WGSN. Forecasting Services/Agencies and its role in forecasting.

FASHION PRODUCT DEVELOPMENT 9 Hours

Fashion Products and its importance - Fashion Industry and new Product Development

FASHION MARKETING COMMUNICATION: Fashion advertising, Sales promotion, Public relations, celebrity endorsement and sponsorship, personal selling, visual merchandising to visual marketing.

Theory : 45 Hours

Total: 45 Hours

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7 Hours

REFERENCES

- Malcolm Barnard "Fashion as communication", Routledge Taylor & Francis Group, 2002
- 2. Mike Easey, "Fashion Marketing", Blackwell Science, 2000.
- 3. Maurice J.Johnson and Evelyn C.moore, "Apparel Product Development", Prentice Hall Inc., 2001.
- 4. Smith, P. R. and Taylor, J., "Marketing Communications: An Integrated Approach", Kozan Page, London, U.K. 2005.
- 5. Agins, T. "The end of Fashion; How Marketing Changed the Clothing Business Forever", Perennial, 2000.
- 6. Hines, T and Bruce, M. "Fashion Marketing-Contemporary Issues", CIM, 2001
- 7. George Belch, Michael A Belch, "Advertising Promotion: An Integrated Marketing Communication Perspective", Tata Mc Graw Hill, 2001.
- John M Penrose, Robert W Rasberry, Robert J. Myers, "Advanced Business Communication", South Western Publication Company, 2001

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Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Demonstrate the importance of logistics and supply chain management and its value for competitive advantage of the firm.
- **CO2:** Analyze and interpret the supply chain, the role of its actors and its logistics flows and function
- CO3: Demonstrate the ability to design and manage Supply Chain
- **CO4:** Critically assess techniques related to logistics and supply chain management required by garment industry
- **CO5:** Understand the concept of distribution network planning and new emerging trends in SCM

Pre-Requistes: NIL

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs				Pr	ogram	nme O	utcon	nes(P	Os)			
	PO	PO	PO	РО	PO	РО	PO	PO	PO	РО	PO	PO
	1	1 2 3 4 5 6 7 8 9 10 11 12										
CO1	Μ									М		
CO2	Μ	М								М	S	
CO3	Μ	S								М	S	
CO4	S											
CO5	Μ											

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course end Survey
End Semester Exam	

Course Content

OVERVIEW OF SCM AND LOGISTICS

9 Hours

Definition of logistics and supply chain management, Evolution of logistics, logistics and competitive performance, physical distribution management. Principles of supply chain management – functions of supply chain

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management, Customer focus in supply chain management – customer service, Efficient Consumer Response (ECR).

DESIGN AND MANAGEMENT OF SUPPLY CHAIN 9 Hours

Phases of supply chain management, inbound and outbound logistics – suppliers to manufacturers, manufacturers to consumers. Logistics management - design and management, integrated supply chain, pull and push strategy. Demand management - demand forecasting and shaping. Bull wick effect- Influencing factors, control measures.

GLOBAL SUPPLY CHAIN MANAGEMENT 9 Hours

Organizing for global markets – World Class Supply Chain Management (WCSCM). Stages in global SCM. International logistics. World class Logistics Management (WCLM)

IT ENABLED SUPPLY CHAIN MANAGEMENT 9 Hours

Information technology in the integrated supply chain, importance, information requirements and applications. Intelligence information system – material resource planning, manufacturing resource planning, enterprise resource planning. IT packages – SAP R/3 ERP, BAAN ERP solutions, i2 Rhythm, selection of suitable package.

Cost and Performance Measurement In Supply Chain Management: Cost drivers, activity based costing, logistics cost, customer profitability analysis. Benchmarking – importance, role and methodology, challenges in implementation. Performance measurement systems.

DISTRIBUTION NETWORK PLANNING

Transportation mix – ware housing, transportation cost, transportation decision and futuristic direction in transportation. Location strategy – plant location, distribution problem, ware house location, retail facility location.

EMERGING TRENDS IN SUPPLY CHAIN MANAGEMENT: Collaboration strategies, Vendor Managed Inventory (VMI), third and fourth party logistics, green supply chain, reverse logistics.

Theory : 45 Hours

Total: 45 Hours

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REFERENCES

- 1. Douglas M.Lambert, James R.Stock and Lisa. M.Ellram, "Fundamentals of Logistics Management", Columbia Boblin Media Corp., 1998.
- Donald J.Bowersox and Davis J.Closs, "Logistics Management The Integrated Supply Chain Process", Columbia Boblin Media Corp., 2006.
- 3. Sunil Chopra and Peter Meindal, "Supply Chain Management: Strategy, Planning and Operations", Prentice Hall Inc., 2001.
- 4. Benjamin S. Blanchard, "Logistics Engineering and Management", Mc Graw Hill, Inc. New York, 2002.
- Martin Christopher, "Logistics and Supply Chain Management Strategies for reducing cost and improving service", Second Edition. McGraw Hill. Inc., New York 1992.

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FUNCTIONAL CLOTHING



Course Outcomes

U14FTE303

After successful completion of this course, the students should be able to

- **CO1:** Recognize the classification and design requirements of various functional clothing like medical wear, protective wear, sportswear, smart and intelligent wear
- CO2: Develop technical design specifications for functional clothes
- **CO3:** Prescribe suitable textile raw materials suitable for developing functional clothes
- **CO4:** Apply the knowledge on textiles processes in designing functional clothing
- **CO5:** Acquire knowledge on the evaluation methods and standards available to evaluate the various functional clothing

Pre Requisite:

U14FTT501 Fashion Apparel Design and Development

U14FT7601 Apparel Product Development

U14FT*T*503 Clothing Science and fit

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1		S	S			S						
CO2	S	S										
CO3	S	S	S									М
CO4	S	S	S									Μ
CO5				S			Μ					

Course Assessment methods:

Direct	Indirect					
Internal tests(I, II, III), Assignment,	Course End Survey					
End Semester Exam						

Course Content INTRODUCTION:

8 Hours

Design logic of apparels-aesthetic and functional properties, fit and



comfort of apparels. Functional clothing - Classification, Design, engineering and Pattern engineering

MEDICAL WEAR:

Classification of medical textiles and their functions – Textile materials used for implants and non-implants, extracorporeal devices, Healthcare and hygiene products. Therapeutic and bio sensing garments – Design and applications.

PROTECTIVE WEAR:

Materials used, requirements and functions of flame resistant protective clothing-chemical protective clothing- mechanical protective clothing electrical protective clothing and radiation protective clothing.

SPORTS WEAR:

Clothing requirements for sportswear- Identifying the needs of the enduser- design development process: Application of technical textiles suitable for sportswear; Footwear Clothing - Design, fit, materials, components and their functions.

SMART AND INTELLIGENT TEXTILES:

Smart fibres: Nano fibres, Photo adaptive fibres, Chameleon fibres, Conductive fibres – properties and applications in textiles and apparels. Phase change materials: production and applications. Shape memory polymers and properties. Stimuli sensitive intelligent textiles, Smart textiles incorporating functional devices.

Theory : 45 Hours

REFERENCES

- 1. Horrocks A. R. and Anand S. C, "Handbook of Technical Textiles", The Textile Institute, Woodhead Publications, Cambridge, UK, 2000
- 2. Adanur S., Wellington Sears "Handbook of Industrial Textiles", Technomic Publishing Co. Lanchester, USA, 1995



8 Hours

10 Hours

9 Hours

10 Hours

Total: 45 Hours

- Vigo T. L., Intelligent Fibres, Journal of Textile Institute, 90, Part
 3, Textile Institute, 1999
- 4. Anand S., "Medical Textiles", Textile Institute, UK, 1996
- 5. Sanjay Gupta, "Smart Textiles Their Production and Marketing Strategies", Bhumica Printers, New Delhi, 2000
- 6. Tao X., "Smart Fibres, Fabric and Clothing", Textile Institute, Woodhead Publishing Ltd., Cambridge, 2001

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U14FTE304 FASHION RETAIL MANAGEMENT Course Outcomes



After successful completion of this course, the students should be able to

CO1: Gain knowledge on the fundamentals of retailing

- CO2: Develop an understanding of customer behavior and retailing
- CO3: Acquire Knowledge on management of merchandise
- **CO4:** Understand the importance of effective location and space management for retailing
- **CO5:** Develop an understanding of retail pricing and strategies in promotional activities

Pre Requisite :

U14FT7601 Apparel Product Development

U14FT7602 Apparel Merchandising

	CO/PO Mapping											
(S/M/W	(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs				Pro	ogram	me O	utcom	nes(PO	Os)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	W					Μ	М					
CO2	W	W							М	Μ	М	Μ
CO3	W	Μ	Μ						Μ	Μ	М	Μ
CO4	W	Μ	S			Μ	М		М	Μ	Μ	М
CO5	W	Μ	S			Μ	М		Μ	Μ	Μ	М

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	1. Course end Survey
End Semester Exam	

RETAILING AND RETAILING ORGANIZATION: 9 Hours Definition, characteristics and functions of retailing, retailers, retailing channels, retail strategy.

Structure of retail organization, retail units, merchandise mix, customer interaction, organized retailing, retail formats, geographical markets, retailing in rural India, vertical marketing system, challenges in retail business.

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RETAIL CUSTOMER BEHAVIOUR:

Consumer behaviour, factors affecting consumer decision making, consumer decision process, influence of situational variables on shopping behaviour, customer profile and analysis.

RETAIL MARKET SEGMENTATION AND TARGET MARKETING:

Segmentation- definition and benefits: Segmenting, targeting and positioning. Criteria for segmentation, types of markets, dimensions for segmentation, types of segmentation. Market targeting, customer profile, survey of buyers intentions.

MERCHANDISE MANAGEMENT:

Product management, brand management and retailing, merchandise management, model stock plan, constraining factors, types of suppliers and selection criteria, category management, merchandise management planning in retail segments.

RETAIL LOCATION AND SPACE MANAGEMENT: 9 Hours

Location decision - importance, levels and determining factors. Types of location, types of consumer goods and location decision. Site selection analysis.

Atmospherics, stores pace management, walls as retail selling tools, colour planning, physical materials in store designing, atmospherics in the context of internet retailing.

RETAIL PRICING & PROMOTION STRATEGY: 11 Hours

Influences on retail pricing strategy, development in retail prices, retail pricing objectives, retail pricing approaches and strategies, consumer responsiveness to prices, role of price elasticity and sensitivity.

Promotion mix selection, advertising, media selection, sales promotion, personal selling and publicity.

Theory : 45 Hours

Total: 45 Hours

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4 Hours

5 Hours

REFERENCES

- 1. Mike Easey , "Fashion Marketing ", Blackwell Scientific Publications, 2002
- 2. Gibson G. Vedamani, "Retail Management Functional Principles and Practices", Jaico Publishing House, Second Edition, 2002
- 3. Nair Suja. R, "Retail Management", Himalaya Publishing House, 2008.
- 4. Bajaj Chetan Srivatsa Tuli, "Retail Management", Oxford University Press, 2008.
- 5. Fleming Peter, "A Guide to Retail Management": Advice on retail operation, customer service and sales team, Jaico Publishing House, Mumbai, 2007.
- 6. Gopal, "Retail Management: An Introduction", ICFAI University press, 2006.

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U14GST002 TOTAL QUALITY MANAGEMENT

Course Outcomes



After successful completion of this course, the students should be able to

- CO1: Understand quality concepts and philosophies of TQM
- CO2: Apply TQM principles and concepts of continuous improvement
- **CO3:** Apply and analyze the quality tools, management tools and statistical fundamentals to improve quality
- CO4: Understand the TQM tools as a means to improve quality
- CO5: Remember and understand the quality systems and procedures adopted

Pre Requisite :

- U14GS7003 Principles of Management
- U14MA7305 Probability and Applied Statistics

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs				Pro	ogram	me O	utcom	nes(PC	Ds)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	S	М							S		
CO2		S										
CO3	М	S	S							S		
CO4	Μ	Μ								S		
CO5	S	Μ										

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course end Survey
End Semester Exam	

INTRODUCTION:

9 Hours

Definition of Quality, Dimensions of Quality, Quality costs, Top Management Commitment, Quality Council, Quality Statements, Barriers

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to TQM Implementation, Contributions of Deming, Juran and Crosby, Team Balancing

TQM PRINCIPLES:

Customer satisfaction – Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Continuous Process Improvement,5S, Kaizen, Just-In-Time and TPS

STATISTICAL PROCESS CONTROL: 9 Hours

The seven tools of quality, New seven Management tools, Statistical Fundamentals – Measures of central Tendency and Dispersion, Population and Sample, Normal Curve, Control Charts for variables and attributes, Concept of six sigma.

TQM TOOLS:

Quality Policy Deployment (QPD), Quality Function Deployment (QFD), Benchmarking, Taguchi Quality Loss Function, Total Productive Maintenance (TPM), FMEA

QUALITY SYSTEMS:

Need for ISO 9000 and Other Quality Systems, ISO 9001:2008 Quality System – Elements, Implementation of Quality System, Documentation, Quality Auditing, ISO 14001:2004

Theory : 45 Hours

REFERENCES

- 1. Dale H.Besterfiled, "Total Quality Management", Pearson Education, 2011.
- 2. James R.Evans & William M.Lidsay, "The Management and Control of Quality", South-Western (Thomson Learning), 2008.
- 3. Feigenbaum.A.V. "Total Quality Management", McGraw Hill, 1991.
- 4. Oakland.J.S. "Total Quality Management", Butterworth Heinemann Ltd., Oxford,1989.

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Total: 45 Hours

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9 Hours

9 Hours

- 5. Narayana V. and Sreenivasan, N.S. "Quality Management Concepts and Tasks", New Age International, 2007.
- 6. Zeiri, "Total Quality Management for Engineers", Wood Head Publishers, 1991.

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ELECTIVE IV

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U14FTE401 APPLICATION OF COMPUTERS IN APPAREL INDUSTRY

L	Т	Р	С
3	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:**Acquire knowledge on basics of computer, CAD / CAM applications in apparel design and in manufacturing.
- **CO2:** Identify and apply the CAD / CAM process in apparel designing and manufacturing.
- CO3: Analyse the designs and developing new designs and requirements.
- **CO4:**Acquire knowledge on different types of management systems in computer aided applications.
- **CO5:**Applying the new concepts of CAD systems.

Pre Requisite : NIL

	CO/PO Mapping											
(S/M/W	(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs				Pro	ogram	me O	utcon	nes(PC	Ds)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S											
CO2		S										
CO3		S										
CO4	S											
CO5		S										

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	1. Course end Survey
End Semester Exam	

COMPUTER BASICS:

7 Hours

Introduction to Computer fundamentals –computer specifications, Input, output, and storage technologies. Computer Software – Application software, system software, commercial software, graphics software – vector and raster graphics. Computer network: LAN/WAN, Web and email.

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COMPUTER AIDED TEXTILE DESIGN SYSTEMS- TEXTILE CAD: 11 Hours

Warp and Weft design, Simulation of colour and weave effect - Plain and stripe effect, automatic peg plan and draft generation; Weave construction library – Knitting Design CAD – features and process in knit designing. Print design CAD: Touch up and production of mask films; automatic repeats and half drop generation, colour separation. Embroidery Design CAD: features and process of punching software.

COMPUTER AIDED FASHION AND PATTERN DESIGN SYSTEMS: 9 Hours

Illustration, garment designing and texture mapping, story board and cataloguing, Virtual Garmenting. 3D Body Measurement System – Digitizer -Pattern Drafting system- Grading – grade rule table - Marker planning.

COMPUTER AIDED GARMENT PRODUCTION SYSTEMS:

11 Hours

Computer application in fabric defect checking, computerized fabric laying and cutting. Principle of Radio frequency tagging- Application in material handling, cutting and ware house storage. Application of Automation and pneumatics in production and finishing machines sewing, fusing, pressing, work aids, stackers, folding and finishing. UPS system- Robotics.

COMPUTER AIDED MANAGEMENT SYSTEMS: 7 Hours

E-prototyping in garments – Electronic catalogues – E-commerce and Mcommerce in apparel industry – Enterprise Resource Planning (ERP), Electronic Data Interchange (EDI), Management Information System (MIS).

Theory : 45 Hours

Total: 45 Hours

REFERENCES

- 1. Rence weiss chase, CAD for fashion Design", Prentice Hall Inc., 1997.
- 2. Winfred Aidrich,"CAD in Clothing and Textiles", Blackwell Science Ltd., 1994.



- 3. Patric Taylor,"Computer in the Fashion Technology", Om Book Service, 1997.
- Sigmon, D.M., Grady P.L. and Winchester S.C, "Computer Integrated Manufacturing and total quality management", Textile Progress, Vol. 27, No.4, 1998, ISBN: 1870372166.

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U14FTE402 LEATHER APPAREL TECHNOLOGY Course Outcomes

L	Т	P	С		
3	0	0	3		

After successful completion of this course, the students should be able to

CO1: Understand the classification of leather materials

- **CO2:**Understand the process of preparing leather for manufacture of leather apparels
- CO3: Gain knowledge on designing leather apparels
- CO4: Gain knowledge on properties and characteristics of leather garments
- **CO5:** Gain knowledge on types of machineries and equipments used in manufacture of leather apparels

Pre-requisites: Nil

CO/PO Mapping												
(S/M/W	(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	Μ											
CO2		Μ										
CO3		Μ										
CO4	Μ											
CO5		Μ										

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	1. Course end Survey
End Semester Exam	

LEATHER TANNAGES:

Principles and practices, preservation techniques: Soaking, Liming, deliming, bating, and pickling. Different methods of pre-tanning processes: light, heavy and Industrial leathers. Types of Tannages: Vegetable, synthetic. Tannage mechanism. Post tanning operations: Neutralisation, bleaching processes and dyeing. Types of leathers: E.I.,tanning of kips , buffcalf, calf and goat and sheep skins, sole leather, chrome sole leather, picking band leathers and pickers.



LEATHER PROCESSING:

Processes and principles involved in manufacture of following types of leather - Wetblue leathers - Full Chrome Upper leathers - Upholstery leathers lining leathers - Harness, Belting and Saddlery leathers. - Football, hockey ball, cricket ball and other sports goods leathers - Chamois leather Fashion garment leathers - Utility glove leathers. Principle methods and mechanism of drying of leathers.

CLASSIFICATION AND TYPES OF LEATHER GARMENTS: Classification of leather garments, based on material design, uses and fashion, anatomy of human body. Types of figures and age group. Principles of Tailoring. Emphasis of sizes, measurements and fitting. Different types of leather garments, Grain garments, Suedes, Fur leather from sheep, goat, cow, calf, chrome, semi - chrome. Combination tanned leather.

PROPERTIES AND CHARACTERISTICS OF LEATHER GARMENTS: general properties of leather such as feel, texture, resistance, rub resistance, uniformity of shades, lining and padding materials, fasteners, grinderies, thread and decorated fitting.

TOOLS, EQUIPMENT, AND MACHINERY:7 Hours

Machines used in garment manufacturing such as Industrial sewing machine – Single & Double, Cloth cutting machine, Button hole & button stitching machine and Ironing process. Tools used for garment manufacturing such as gimping scissors, wooden & iron hammer, stone slabs, measuring tapes, measuring instruments (L square), Shaper, Crayons, Special furniture required for garment unit and dummy for checking fitting.

APPAREL DESIGNING:

Preparation of sectional patterns, Arrangements of patterns to minimize the wastage of leathers. Recovery of wastage and its utilization. Designing and fabrication of garments, gloves, cap coat, pant etc. Shoe: Selection of leather, upper closing lasting and conditioning. Designing and fabrication of shoes.

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SEQUENCE OF OPERATION:

Principle of cutting components, colour matching, texture feel, type of stitching, and attachment, Sequence of operation for assembly of components for garment manufacturing.

QUALITY CONTROL IN LEATHER GARMENTS:

In process checking and final checking of measurements, get up and overall quality of free hand sketching and drafting and preparation of pattern.

Theory : 45 Hours

Total: 45 Hours

REFERENCES:

- 1. Grace I, Kunz and Ruth E. Glock, "Apparel Manufacturing: Sewn Product Analysis", Prentice Hall, Fourth Edition, 2004.
- Dutta.S S, "An Introduction to the Principles of Leather Manufacture", Fourth Edition, Indian Leather Technologists Association, Calcutta, 2002.
- 3. Sandy Scrivano,"Sewing with Leather & Suede", Lark Books, 2002.
- 4. Thomas C, Thorstensen, "Practical Leather Technology", Krieger Publishing Company, 2001.
- 5. Mary Maguire, "Leather Work", Lawrence Publication House, 2000.

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U14FTE403 GLOBAL MARKETING AND SOURCING STRATEGIES



Course Outcomes

After successful completion of this course, the students should be able to

- CO1: Acquire knowledge on drivers and factors influencing global marketing.
- **CO2:** Understand the process of global management.
- CO3: Acquire knowledge on sourcing strategies.
- **CO4:** Identify the elements of sourcing design.
- CO5: Analyze trends in growth of global markets

Pre Requisite : Nil

CO/PO Mapping												
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs	Programme Outcomes(POs)											
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S											
CO2	S											
CO3	S											
CO4		S										
CO5		S										

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	1. Course end Survey
End Semester Exam	

GLOBAL MARKETING:

Introduction to Global Marketing – Drivers towards Globalization -Factors influencing global marketing – economic, social and cultural. Limitations to Global Marketing. Global Competitive analysis competitive environment, country specific advantages, firm specific advantages.

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GLOBAL MANAGEMENT:

Global customers - Global segmentation and positioning- market segments, global product positioning, positioning a new brand, positioning a global brand. Global Product and Services - Global product lines, services, service quality, globalization of services. Distribution strategies, advertising, promotion. Organizing for Global Marketing - Organizational structure, management systems, people and organizational culture.

SOURCING STRATEGIES:

Principles of sourcing strategy - out sourcing. Sourcing goals and objectives. Source selection - contracts and incentives, supplier strategies. Sourcing data and reports.

SOURCING DESIGN:

Sourcing design elements. Risks and rewards of multiple sourcing. Capacity constraints and pricing in sourcing markets. LIC selection and incentives for innovation - Yard stick contracts. Case studies in sourcing.

FUTURE OF GLOBAL MARKETING:

Growth of markets – developed and under developed countries. Issue of Trade cycles. Rise of under developed and developing countries. Global marketing case studies.

Theory : 45 Hours

REFERENCES

- 1. Warren.J.Keegan, "Global Marketing Management", 7th Edition, Prentice Hall of India, New Delhi, 2008.
- 2. Johany. K.Johansson, "Global Marketing", Second Edition, Irwin McGraw Hill, 1995.
- 3. Subash C, Jain, "International Marketing", Sixth Asian books (P) Ltd, South Western Thomson learning, 1993.
- 4. Cateora, "Organisations Structures", Tenth Edition, McGraw Hill, 1997.
- 5. Sudhi Sheshadri "Sourcing Strategy", Principles, Policy and Design, Springer, 2005.

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9 Hours oals and

9 Hours

9 Hours

9 Hours

Total: 45 Hours

TECHNICAL TEXTILES

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Course Outcomes

U14FTE404

After successful completion of this course, the students should be able to

- **CO1:** Acquire knowledge on the principles of engineering applied in the manufacture of technical textiles and apply the same in apparel engineering processes.
- **CO2:**Analyze and identify required parameters vital to design and manufacture apparel products with technical application suiting the needs of the customer.
- CO3: Use and create textiles for new technical applications
- **CO4**:Acquire knowledge on different special fibres and composites used for technical applications
- CO5:Acquire knowledge on various technical apparels used in different domains

Pre Requisite :

U14FTT201 Fibre science and Yarn Technology

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs				Pro	ogram	me O	utcom	nes(PC	Ds)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	S										
CO2		S	Μ	S								
CO3	Μ	S	S		Μ	S						
CO4	S	Μ										
CO5	S	Μ										

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course end Survey
End Semester Exam	

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8 Hours

TECHNICAL TEXTILES: Definition and scope of technical textiles, Classification.

TECHNICAL FIBRES: High strength and modulus organic fibres – High chemical and thermal resistance organic fibres. High performance inorganic fibres – Ultra fine and Novelty fibres.

9 Hours

9 Hours

AGRO TEXTILES: Textiles for crop covers, bird netting, soil mats and silos. Shade fabrics and textiles for green houses.

GEO TEXTILES: Types and application of geo synthetics. Functions and application areas of geo textiles. Mechanics of reinforcement, filtration and drainage by geo textiles.

AUTOMATIVE TEXTILES: Application of textiles in automobiles. Requirement and design for pneumatic tyres, airbags and belts. Textiles in passenger cars, other road vehicles, Rail applications, Air crafts, Marine application. Application of composites in automotives.

10 Hours

PROTECTIVE TEXTILES: Waterproof fabrics – breathable fabrics – Fire protection – Heat and cold protection – Ballistic protective clothing – Camouflage textiles – NBC protection

9 Hours

TEXTILES IN FILTRATION: Dust collection, Solid-liquid separation, liquid – liquid filtration, liquid-gas separation, Mechanism of filtration, Fabric construction, Finishing treatments,

PACKAGE TEXTILES: Textiles in food packaging. Fabrics for bags and luggage. Flexible Intermediate Bulk Packing.

Theory : 45 Hours

REFERENCES:

- 1. Sabit Adanur and Wellington Sears, "Handbook of Industrial Textiles", Technomic Publishing company Inc., USA, 1995.
- 2. A. R. Horrocks and S. C. Anand, "Handbook of Technical Textiles", Woodhead Publishing Ltd., and the Textile Institute, 2000.



Total: 45 Hours

- 3. S.K. Mukhopadhyay & J.F. Partridge, "Automotive Textiles", Textile Progress, Vol.29, No.1/2, the Textile Inst. Publication, 1999.
- 4. Dr. V K Kothari, "Progress in Textiles : Science and Technology", Vol 3, Technical Textiles Technology, Development & Applications, IAFL Publications, New Delhi, 2008.
- 5. Fung & Warner, "Textiles in Automobile Engineering" Woodhead Publishing, ISBN: 978-1-85573-493-7, 2000.
- **6.** K.L. Floyd, "Industrial Application of Textiles", Textile Progress Vol.6 No.2 Textile Institute Publication, 2009.
- 7. Medical Textile International Conference, Bolton UK, 2007.

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ELECTIVE V

From Chairman - Board of Studies

U14FTE501

NONWOVENS



Course Outcomes

After successful completion of this course, the students should be able to

CO1: Acquire knowledge in different fibres used in nonwovens.

CO2: Acquire knowledge in web formation techniques.

CO3: Explain different web bonding techniques of nonwovens.

CO4: Acquire knowledge in finishing of nonwovens.

CO5: Develop skills in testing of nonwovens.

Pre Requisite : Nil

	CO/PO Mapping											
(S/M/W	(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs				Pre	ogran	nme O	utcon	nes(P	Os)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	S	Μ							S		
CO2		S										
CO3	Μ	S	S							S		
CO4	Μ	Μ								S		
CO5	S	Μ										

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	1. Course end Survey
End Semester Exam	

INTRODUCTION TO NONWOVEN:

9 Hours

9 Hours

Nonwovens: Introduction, Definition, Fibres used in nonwovens, Comparison of woven, knitted and nonwoven structures. Nonwoven properties including environmental considerations. Nonwoven applications in technical garments.

WEB FORMATION TECHNIQUES:

Dry laid web Formation: Raw material - Fibre Opening – Carding – Cross lapping - perpendicular-laid web formation - Airlaid web formation: Air laying technology - bonding systems & finishing - properties & applications. Wet-laid web formation: Raw materials – fibre preparation – web forming technology – bonding systems – finishing- properties &



applications. Polymer laid web formation: Spun bonding and Melt blown process: raw material - production technology - structure and properties application.

WEB BONDING TECHNIQUES:

Mechanical Bonding: Stitch bonding, Needle Punching: principle- various factors influencing needle punching process – properties and applications. Thermal Bonding: principle – raw materials – structure and properties – applications.

Chemical Bonding: Chemical binders – mechanism of chemical bonding – methods of binder application – drying – Limitations and applications.

FINISHING OF NONWOVENS: 9 Hours Wet Finishing: Washing, coloration – dyes, dyeing machines; printing. Application of Chemical Finishes- antistatic agents, antimicrobial finishes, softening, flameproof, waterproof, stiffeners, UV stabilizers

Methods for applying chemical finishes- padding, coating, lamination. Mechanical Finishing-splitting and winding, perforating, drying, compressive finishes, calendaring; Surface finishing- singeing, shearing, flocking, raising, polishing, softening. Development in nonwoven finishing.

TESTING OF NONWOVEN:

Testing of Nonwoven fabrics: weight, thickness, fibre orientation, fabric porosity, pore size & pore size distribution, dry sieving, wet sieving, hydrodynamic sieving, bubble point test method, measuring tensile properties, measuring gas and liquid permeability, measuring water vapour transmission, measuring wetting and liquid absorption, measuring thermal conductivity and insulation

Theory : 45 Hours REFERENCES

- 1. Hand Book of Nonwovens Edited by S.J.Russell, Wood head publications Ltd., ISBN- 13: 978-1-85573-603-0, 2007.
- 2. Nonwoven Fabrics: Raw Materials, Manufacture, Applications, Characteristics, Testing Processes, Edited by Wilhelm Albrecht, Hilmar Fuchs and Walter Kittelmann, WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim,, ISBN: 3-527-30406-1, 2003.

Total: 45 Hours

9 Hours

9 Hours

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- 3. Hand Book of Technical Textiles Edited by S.C.Anand & A.R.Horrocks, Wood head publications Ltd., ISBN 1 85573 385 4, 2000.
- 4. Applications of Nonwovens in Technical textiles, Edited by R.A.Chapman, CRC press, 2010.

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U14FTE502 THEORY OF TEXTILE STRUCTURES

Course Outcomes:



After successful completion of this course, the students should be able to

- **CO1:** Analyze the geometry and construction of various fabrics and relate the geometry with fabric properties
- **CO2:** Formulate equations for prediction of tensile properties of various fabrics and explain the reasons for such behavior.
- **CO3:** Explain the theories of mechanical properties of fibres
- **CO4:** Apply the knowledge of Dimensional properties and Relaxation shrinkage in designing knitted garments.
- **CO5:** Explain the theories of fibre structure and properties of fibres.

Pre-requisite courses:

U14MA7201	Engineering	Mathematics – II
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	CO/PO Mapping											
(S/M/V	S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	S										
CO2	S	S										
CO3	S	S										
CO4	S	S										
CO5	S	S										

Course Assessment Methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course End Survey
End Semester Exam	

THE STRUCTURE PROPERTIES OF FIBRES9 Hours

Structure of fibres, morphology and order in fibre structure. Theories of fine structures of fibres. Frictional properties – Theory of friction and lubrication and its application to fibres. Measurement of friction. Thermal and optical behaviour of fibres. Swelling and theories of moisture sorption.

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Di-electric properties. Effects of frequency and temperature on dielectric constant and static electricity.

THE MECHANICAL PROPERTIES OF FIBRES. 9 Hours

Theories of elasticity. Thermodynamic analysis of deformation. Rubber elasticity of long chain molecules and molecular network. Application to fibres. Theories of viscose-elasticity. Stress relaxation, creep, stress-strain relations, visco-elasticity of natural fibres.

YARN AND FABRIC MECHANICS

Basic Yarn Geometry - Packing of fibres in yarn; Fibre arrangement in twisted yarn; Fabric Mechanics: Fabric Specifications and cover factor. Plain cloth geometry - crimp ratio and thread spacing - setting theory and maximum set. Pierce's flexible and elastic thread model - Oloffson's general model. Crimp interchange in woven fabrics - crimp balance geometrical structure of twill and mat weaves.

TENSILE PROPERTIES OF WOVEN FABRICS 9 Hours

Tensile properties of woven fabrics: stress-strain curve. Modeling of tensile behavior, anisotropy of woven fabric. geometrical changes during the extension of cloth - load extension modulus, Application of force, energy and finite element methods in fabric tensile behavior analysis.

KNITTING DYNAMICS

Knitting Dynamics: Yarn tension and knitting forces - effect of cam shape, increase in number of feeders and increase in linear speed. Single jersey knitted fabric Geometry and Properties: Tightness factor - Dimensional properties - Spirality - Relaxation - shrinkage

REFERENCES:

- 1. Manufactured Fibre Technology, VB Gupta & VK Kothari, Springer Science & Business Media, 1997.
- 2. Physical properties of Textile Fibres, WE Morton & JWS Hearle, Woodhead Publishing Ltd., 2008.

J.m. Chairman - Board of Studies

9 Hours

9 Hours

- 3. Seyam A M, "Structural Design of Woven fabrics", Textile progress Vol.31, No: 3. Wood Head Publishing Ltd, 2002
- 4. Progress in Textiles: Science & Technology Vol. 1, Testing and Quality Management, V.K. Kothari, IAFL Publications, New Delhi, ISBN: 81- 901033-0-X, 1999.
- 5. J Hu, "Structure and mechanics of Woven fabrics", Hong Kong Polytechnic University, Wood Head Publishing Ltd, 2004.
- 6. Hearle J W S, Grosberg P and Backer S, "Structural mechanics of fibres, yarn and fabrics", Wiley Inter science Publishing Ltd., 1969.

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U14FTE503 APPLICATION OF ERP AND MIS IN APPAREL INDUSTRY



Course Outcomes

After successful completion of this course, the students should be able to

- CO1: Acquire knowledge on basics of ERP and MIS.
- CO2: Acquire knowledge on the application and modules of ERP in apparel Industry.
- CO3: Acquire Application strategy of Information Systems in apparel industry.
- **CO4:** Develop knowledge on internet and electronic commerce and their day to day importance.
- **CO5:** Describing and developing knowledge on transforming Information systems to the business operations

Pre Requisite : NIL

	CO/PO Mapping											
(S/M/W	(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs				Pro	gram	me Oi	utcom	es(PC)s)			
	PO	PO	PO	PO	PO	РО	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S											
CO2	S											
CO3	S									Μ		
CO4		S								Μ		
CO5		S								Μ		

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	1. Course end Survey
End Semester Exam	

INTRODUCTION:

An overview and features of ERP, MIS integration, ERP drivers, Trends in ERP, ERP in India. ERP system perspective – Management Information System, Operations Support System, Transaction Processing System, Network Structure of ERP system, ERP work flow,

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9 Hours

Process modeling for ERP systems, Communication in ERP systems, OLTP, (On Line Transaction Processing), OLAP (On Line Analytical Processing), Enterprise Integration application tools for ERP.

RESOURCE MANAGEMENT PERSPECTIVE: 9 Hours

ERP packages, Finance, Production, Business modules in Human Resource. Plant Maintenance, Materials Management, Ouality Management, Sales and Distribution, Resource Management, Business Process Reengineering, Relationship between ERP and BPR, ERP Implementation Life cycle, Implementation methodology, ERP Project Management and Monitoring. ERP and E-Commerce, ERP Culture, ERP and CRM, ERP and SCM, ERP selection issues, ERP in Public Sector Enterprises, Pre- and Post-implementation issues, ERP Vendors, Key ERP consultants in India, Future directions in ERP.

BASICS OF INFORMATION SYSTEM:

Introduction to Information system in business, Need for Information Technology, System concept, Components of information an system, Information system resources, Information system activities, recognizing information system. Expanding role of information systems, Operating support system, Management support systems.

INTERNET AND ELECTRONIC COMMERCE: 9 Hours

Introduction, Business use of internet, Interactive marketing, Business value of the internet, Customer value and the internet. Fundamentals of Electronic Commerce (EC), EC applications, Business-to-Consumer commerce, Business to Business commerce, Electronic payments and security.

INFORMATION SYSTEMS FOR BUSINESS OPERATION: 9 Hours Applications of intranets, intranet technology resources, the business value intranets, the role of Extranets, enterprise collaboration of systems. Information systems for marketing, manufacturing, human resources, accounting, financial, transaction processing, managerial and decision support, Information systems for strategic advantages, Strategic application and issues in IT, ethical and societal challenges of information technology. **Total: 45 Hours Theory : 45 Hours**



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9 Hours

REFERENCES

- 1. V.K.Garg, Venkat and N.K.Krishna, "ERP Concepts and Practices", 1st edition, PHI Publications, 1997.
- 2. James A. O'Brien, "Introduction to Information Systems", Tata McGraw Hill, New Delhi, 2005.
- 3. Alexis Leon, "ERP Demystified", 1st edition, Tata McGraw Hill, New Delhi, 2000.
- 4. S.Sadagopan, "ERP: A Managerial Perspective", 1st edition, Tata McGraw Hill, New Delhi, 1999.
- 5. Langenalter, A.Gary, "Enterprise Resources Planning and Beyond", 1st edition, St. Lucie Press, USA, 2000.
- 6. Diwan, Parag and Sharma, Sunil, "Enterprise Resource Planning: A Manager's Guide", 1st edition, 1999.
- E.Turban, E.McLean and J.Wetherbe, "Information Technology for Management: Making Connections for Strategic Advantage", John Wiley and Sons, New Jersey, 2001.
- 8. W.S.Jawadekar, "Management Information Systems", Tata McGraw Hill, New Delhi, 2004.

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U14FTE504 APPAREL BRAND MANAGEMENT

Course Outcomes

After successful completion of this course, the students should be able to

CO1: Acquire knowledge on branding strategy and positioning

- CO2: Understand the brand building and extension strategies
- CO3: Demonstrate understanding of brand management and global branding
- CO4: Acquire knowledge on Advertising types and advertisement business
- **CO5:** Demonstrate ability to create advertisement message, select media, and work out budget.

Pre-requisites: NIL

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	Μ				Μ							
CO2	Μ				Μ					Μ		
CO3	W				Μ					Μ		
CO4	S	Μ								Μ		
CO5	Μ	Μ								Μ		

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	1. Course end Survey
End Semester Exam	

BASICS OF BRANDING:

Concept, image, identity, loyalty. Brand name - types. Branding strategy -Brand positioning - competitive positioning, product positioning. Brand equity. Intellectual property rights – Trademark and brand registration.

BRAND BUILDING:

Consumer branding, technology branding, corporate branding, retail branding. Brand extension: Concept, evaluation of opportunities, factors influencing extension, extension guidelines.

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9 Hours

9 Hours

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GLOBAL BRANDING:

Rationale, advantages / disadvantages. International branding strategy - planning system, leadership, cross-country relationship.

Brand Management Systems: Role of Product managers / brand managers. Trends in brand management - brand cult. Brand alliances – co branding, licensing.

ADVERTISING:

Definition, advertising objectives, benefits, economic aspects and ethics in advertising. Advertising and marketing mix.

Advertising Appeal: Message – reach, frequency, impact and effectiveness Media Overview: Types of media, media selection, media plan, media cost and availability. Matching media and market. Media strategy - media mix, media scheduling. Comparative evaluation.

ADVERTISING BUSINESS:

Organization, advertising manager, advertising agency, advertising plan, basic principles, agency compensation. Public relations. Advertising Budget: Allocation of budget for various components of advertising. Methods of determining budget for advertisement. Administering the advertisement budget

Theory : 45 Hours

REFERENCES

- 1. Harsh.V.Verma, "Brand Management- Text and Cases", Excel Books, New Delhi, 2005
- 2. Moorthi Y L R, "Brand Management", Vikas Publications House Pvt. Ltd., Mumbai, 2004.
- 3. Kevin Lane Keller, "Strategic Brand Management", Prentice Hall, 2nd Edition, 2006
- 4. Sengupta S, "Brand Positioning", Tata McGraw Hill, New Delhi, 2006.
- 5. K.S.Chandrasekhar, "Product Management Text and Cases", Himalaya Publishing House, 1st Edition, 2002.
- 6. S.A.Chunnawala, "Product Management", Himalaya Publishing Home, First Edition, 1998.

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Total: 45 Hours

9 Hours

9 Hours

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9 Hours

ELECTIVE VI

From Chairman - Board of Studies

U14FTE601 ENTREPRENEURSHIP DEVELOPMENT L 3 0 0 **Course Outcomes**

After successful completion of this course, the students should be able to

- CO1: Recognize the factors affecting Entrepreneurship growth and their problems.
- **CO2:** Outline the importance of Entrepreneurial Development programmes.
- CO3: Describe the projects identification, selection and formulation procedure

CO4: Indicate the role of government in entrepreneurial development

CO5: Underline the basis of intellectual property rights in India.

Pre Requisite : Nil

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	S	Μ							S		
CO2		S										
CO3	Μ	S	S							S		
CO4	Μ	Μ								S		
CO5	S	Μ										

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course end Survey
End Semester Exam	

ENTREPRENEUR:

Entrepreneurship and economic development - its importance -Entrepreneur Qualities, nature, types, traits of entrepreneur. Similarities and differences between entrepreneur and manager - factors affecting entrepreneurship growth-Problems of entrepreneurs

ENTREPRENEURIAL PROMOTION:

factors - Entrepreneurial development Motivation: Theories and



9 Hours

9 Hours

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programmes – need, objectives, phases and evaluation - Training and developing - occupational mobility - factors in mobility - Role of consultancy organizations in promoting entrepreneurs.

PROJECT MANAGEMENT:

Project identification and selection - project formulation - Report preparation – evaluation: marketing - technical and financial.

Role of government in entrepreneurial development – District Industry Centre and its role – Government incentives – financial and non-financial - Sectoral reservation for SSI and tiny sector.

PROPERTY

Definition and ownership-kinds of property-types of intellectual propertypatent-trade marks - industrial design-need for protection for IP-WIPO and its activities-TRIPS Agreement-evoluation of IPR in India.

Theory : 45 Hours

REFERENCES

- 1. Entrepreneurial Development by S S Khanka, S. Chand and Co: 2008 ISBN: 81-219-1801-4,
- 2. Intellectual Property Rights Text and Case, by Dr. R. Radhakrishnan and Dr.S. Balasubramanian, Excel Books, 2008, ISBN: 978-81-7446-609-9
- 3. Vasanth Desai "Dynamics of Entrepreneurial Development and Management" Himalaya Publishing House, 2011
- 4.N.P.Srinivasan and G.P. Gupta "Entrepreneurial Development" Sultanchand and Sons., 2008
- 5.P.Saravanavelu "Entrepreneurship Development" Eskapee publications, 2008.
- 6. S.S.Khanka "Entrepreneurial Development" S.Chand and Company Ltd., 2008
- 7.Satish Taneja, Entrepreneur Development; New Venture Creation, 2010
- 8. www.iprventure.com,



9 Hours

9 Hours

Total: 45 Hours

9 Hours

U14FTE602 ENERGY MANAGEMENT IN APPAREL INDUSTRY



Course Outcomes

After successful completion of this course, the students should be able to

CO1: Recognize the need for Energy Management and Conservation

CO2: Acquire knowledge on Energy Audit and Energy Control

CO3: Outline the Energy Conservation areas and methods in Factory

CO4: Acquire knowledge on the Developments in Energy Efficient Technologies

CO5: Apply knowledge of Non Conventional Energy Sources

Pre Requisite : Nil.

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs				Pr	ogran	nme C)utcor	nes(P	Os)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	S	Μ							S		
CO2		S										
CO3	Μ	S	S							S		
CO4	Μ	Μ								S		
CO5	S	Μ										

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course end Survey
End Semester Exam	

ENERGY MANAGEMENT AND CONSERVATION: 7 Hours Concept of energymanagement - need for energy conservation -Demand - Supply Management.

Global Energy Concerns: Global energy conservation scenario – energy conservation measures in India. United Nations Framework on sustainable development, Kyoto Protocol.

ENERGY MANAGEMENT AND AUDIT: 11 Hours

Definition of Energy Audit, need and types of energy audit, energy



audit instruments. Understanding energy costs, bench marking energy performance, matching energy use to requirement, basic principles for optimizing the input energy requirements. Energy Management Department - Top management support, managerial function, roles and responsibilities of energy manager, accountability. Motivation of employees: Information system – overcoming barriers.

Energy Monitoring and Control: Cumulative Sum of Differences (CUSUM) of Energy production and consumption, Energy production and consumption monitoring and control, elements for monitoring, data analysis and control.

ENERGY CONSUMPTION ANALYSIS: 12 Hours

Methods for energy consumption analysis. Analysis for apparel manufacturing machineries and finishing equipments. Cost of energy Vs sales value of apparel product.

Energy Conservation in Factory: Energy saving opportunities with energy efficient motors. Factors affecting the electrical energy performance and energy saving opportunities. Factors affecting Refrigeration and Air conditioning system performance and saving opportunities. Lighting System - Light source, choice of lighting, luminance requirements, and energy conservation avenues. Diesel Generating system - Factors affecting selection, diesel energy conservation avenues. Waste Heat Recovery - Classification of waste heat. Source of waste heat in apparel industry. Commercially viable waste heat recovery devices, saving potential.

DEVELOPMENTS IN ENERGY EFFICIENT TECHNOLOGIES: 7 Hours

Maximum demand controllers, automatic power factor controllers, energy efficient motors, soft starters with energy saver, variable speed drives, energy efficient transformers, electronic ballast, and energy efficient lighting controls.

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APPLICATION OF NON CONVENTIONAL ENERGY SOURCES: 8 Hours

Scope of application of non-conventional energy - Solar energy: different type of collectors — photovoltaic cells. Wind energy, Bio energy, environmental impact on energy and co-generation by using different techniques.

Theory : 45 Hours

Total: 45 Hours

REFERENCES

- 1. Kalyanaraman. A.R, "Energy Conservation in Textile Industries", SITRA 1995 (Revised)
- 2. Palaniappan.C et al, "Renewable Energy Applications to Industries", Narose Publishing House, New Delhi, 1998.
- 3. Pradeep Chaturvedi and Shalini Joshi, "Strategy for Energy Conservation in India", Concept Publishing Co., New Delhi, 1995.
- Proceedings of International Seminar cum Exhibition, "ASIA Energy Vision 2020 - Sustainable Energy Supply", November 15-17, 1996
- 5. Proceedings of 12th Shirley International Seminar, "Profitable Energy Savings in the Textile Industry", September 16-18, 1980
- 6. Proceedings of the Seminar, "Strategies for Sustainability of Energy Efficient and environmental Friendly Technologies in Small and Medium Scale Sector", PSG College of Technology, November 24, 2000.
- 7. Proceedings of All India Workshop, "Latest Trends in Energy Audit Systems", Institution of Engineers (I), December 12-13, 1993.

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U14GST005 ENGINEERING ECONOMICS AND FINANCIAL MANAGEMENT



Course Outcomes

After successful completion of this course, the students should be able to

- CO1: Evaluate the economic theories, cost concepts and pricing policies
- CO2: Understand the market structures and integration concepts
- **CO3:** Understand the measures of national income, the functions of banks and concepts of globalization
- CO4: Apply the concepts of financial management for project appraisal
- **CO5:** Understand accounting systems and analyze financial statements using ratio analysis

Pre Requisite : Nil

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	S	Μ							S		
CO2		S										
CO3	Μ	S	S							S		
CO4	Μ	Μ								S		
CO5	S	Μ										

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	Course end Survey
End Semester Exam	

ECONOMICS, COST AND PRICING CONCEPTS 9 Hours

Economic theories – Demand analysis – Determinants of demand – Demand forecasting – Supply – Actual cost and opportunity cost – Incremental cost and sunk cost – Fixed and variable cost – Marginal costing – Total cost – Elements of cost – Cost curves – Breakeven point and breakeven chart – Limitations of break even chart – Interpretation of

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break even chart – Contribution – P/V-ratio, profit-volume ratio or relationship – Price fixation – Pricing policies – Pricing methods

CONCEPTS ON FIRMS AND MANUFACTURING PRACTICES 9 Hours

Firm – Industry – Market – Market structure – Diversification – Vertical integration – Merger – Horizontal integration

NATIONAL INCOME, MONEY AND BANKING, ECONOMIC ENVIRONMENT 9 Hours

National income concepts – GNP – NNP – Methods of measuring national income – Inflation – Deflation – Kinds of money – Value of money – Functions of bank – Types of bank – Economic liberalization – Privatization – Globalization

CONCEPTS OF FINANCIAL MANAGEMENT 9 Hours

Financial management – Scope – Objectives – Time value of money – Methods of appraising project profitability – Sources of finance – Working capital and management of working capital

ACCOUNTING SYSTEM, STATEMENT AND FINANCIAL ANALYSIS 9 Hours

Accounting system – Systems of book-keeping – Journal – Ledger – Trail balance – Financial statements – Ratio analysis – Types of ratios – Significance – Limitations

Theory : 45 Hours

Total: 45 Hours

REFERENCES

- 1. Prasanna Chandra, "Fundamentals of Financial Management", Tata Mcgraw Hill Publishing Ltd., Third Edition, 1999.
- 2. Weston & Brigham, " Essentials of Managerial Finance", Cengage Learning, 14th edition, 2007.
- 3. Pandey, I. M., "Financial Management", Vikas Publishing house Pvt Ltd., 2009.
- 4. James C. Van Horne, "Fundamentals of Financial Management", Prentice Hall, 11th Edition, 2000.



- 5. James C. Van Horne, "Financial Management & Policy", Prentice Hall, 12th Edition, 2001.
- M. Y. Khan & P. K. Jain, "Management Accounting & Financial Management", Tata Mcgraw Hill Education (P)Ltd., seventh Edition, 1985.
- 7. Management Accounting Principles & Practice -P. Saravanavel

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U14GST006

PRODUCT DESIGN AND DEVELOPMENT

L	Т	Р	С
3	0	0	3

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Understand the process to plan and develop products
- **CO2:** Understand the process of collecting information and developing product specifications
- **CO3:** Understand the concept generation, selection and testing processes
- **CO4:** Understand the concepts of product architecture, industrial design and design for manufacture
- **CO5:** Understand the basics of prototyping, economic analysis and project planning and execution processes

Pre Requisite : Nil

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs				Pro	ogram	me O	utcon	nes(PC	Ds)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	РО	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S	S	Μ							S		
CO2		S										
CO3	Μ	S	S							S		
CO4	Μ	Μ								S		
CO5	S	Μ										

Course Assessment methods:

Direct	Indirect
Internal tests(I, II, III), Assignment,	1. Course end Survey
End Semester Exam	

INTRODUCTION - DEVELOPMENTPROCESSESANDORGANIZATIONS - PRODUCT PLANNING9 Hours

Characteristics of successful product development to Design and develop products, duration and cost of product development, the challenges of product development.

A generic development process, concept development: the front-end process, adapting the generic product development process, the AMF



development process, product development organizations, the AMF organization.

The product planning process, identify opportunities. Evaluate and prioritize projects, allocate resources and plan timing, complete pre project planning, reflect all the results and the process.

IDENTIFYING CUSTOMER NEEDS - PRODUCT SPECIFICATIONS

9 Hours

Gathering raw data from customers, interpreting raw data in terms of customer needs, organizing the needs into a hierarchy, establishing the relative importance of the needs and reflecting on the results and the process. Specifications, establish specifications, establishing target specifications setting the final specifications.

CONCEPT GENERATION - CONCEPT SELECTION - CONCEPT TESTING 9 Hours

The activity of concept generation clarify the problem search externally, search internally, explore systematically, reflect on the results and the process.

Overview of methodology, concept screening, concept scoring, caveats.Purpose of concept test, choosing a survey population and a survey format, communicate the concept, measuring customer response, interpreting the result, reflecting on the results and the process.

PRODUCT ARCHITECTURE - INDUSTRIAL DESIGN - DESIGNFOR MANUFACTURING9 Hours

Meaning of product architecture, implications of the architecture, establishing the architecture, variety and supply chain considerations, platform planning, related system level design issues.

Assessing the need for industrial design, the impact of industrial design, industrial design process, managing the industrial design process, assessing the quality of industrial design.

Definition, estimation of manufacturing cost, reducing the cost of components, assembly, supporting production, impact of DFM on other factors.

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PROTOTYPING - PRODUCT DEVELOPMENT ECONOMICS -MANAGING PROJECTS 9 Hours

Prototyping basics, principles of prototyping, technologies, planning for prototypes.

Elements of economic analysis, base case financial mode,. Sensitive analysis, project trade-offs, influence of qualitative factors on project success, qualitative analysis.

Understanding and representing task, baseline project planning, accelerating projects, project execution, postmortem project evaluation.

Theory : 45 Hours

Total: 45 Hours

REFERENCES

- 1. Ulrich (Karl T)& Eppinger (Steven D) " Product Design and Development" McGrawHill Inc., Newyork, 1995
- 2. A K Chitale & R C Gupta, "Product Design and Manufacturing", Prentice Hall of India (P) Ltd., 1997
- 3. Tim Jones, "New Product Development An Introduction to Multi functional Process", Butterworth –Heinemann,1997.
- 4. Boodhroyd Geoffrey, "Product Design for Manufacture and Assembly" Taylor & Francis Group, Second edition, 2002.

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ONE CREDIT COURSES

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U14FTIN01 DESIGN OF EXPERIMENTS

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:**Acquire knowledge on basic principles of statistical design of experiments
- CO2:Collect experimental data, entry of data in software according to given procedure
- **CO3:** Identify the procedure for analyzing the data using the appropriate statistical tool, developing relevant models for analysis and interpretation

Pre Requisite : Nil

CO/PO Mapping												
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs				Pro	ogram	me C	utcor	nes(P	Os)			
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S			S								
CO2				S						S		
CO3		S		S	S							

Course Assessment methods:

Direct	Indirect
Continuous assessment	Course end Survey

EXPERIMENTS:

1.	Data Collection and Processing of Data
2.	Frequency Distribution-Graphical Representation
3.	Calculation of mean, variance, Standard deviation and CV
4.	Probability distributions
5.	Testing of hypothesis-t-test, F-test
6.	Control Charts
7.	ANOVA
8.	Correlation
9.	Regression
10	Chi-square test

Theory: 15 Hours

Total: 15 Hours

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REFERENCES

- 1. Montgomery D C, Design and Analysis of Experiments, John Wiley & Sons, 2004
- 2. Kothari C P, Research Methodology-Methods and Techniques, Mishra Prakeshan, 2000
- 3. Minitab-Software manual
- 4. SPSS software manual

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NEW TRENDS IN PRINTING

Course Outcomes

U14FTIN02

After successful completion of this course, the students should be able to

- CO1: Acquire knowledge on new printing techniques
- CO2: Acquire knowledge on different printing substrate and materials used commercially
- **CO3:** Acquire knowledge on carpet and hometextile printing techniques
- **CO4:** Ability to explain various printing methods, machines and styles for fabric and garment
- CO5: Create innovations in the field of printing

Pre Requisite :

U14FT*T*504 Textile Chemical Processing

U14FTP502 Textile chemical processing laboratory

CO/PO Mapping												
(S/M/W	(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1		S										
CO2		Μ			S							
CO3		Μ			S							
CO4		Μ		S								
CO5			S		S							

Course Assessment methods:

Direct	Indirect
Continuous assessment	Course end Survey

DIGITAL PRINTING

Different types, Substrate preparation, Ink Formulation, Digital colour management, Industrial production printers.

TRENDS IN PRINTING:

Ajrak, Akola, Brushprint, Bagru, Balaotra, 3D print, Dewdrop, Dabu print Flock, Foil, Fluorescent printing, Gold, Jawata, Khari, Pigment, Pearl, Puff, Rubber, Rapid print, Neptoal, Modern abstract prints.



3 Hours

9 Hours

NEW TRENDS:

3 Hours

Trends in Garment printing, Carpet and Home textile printing

Theory: 15 Hours

Total: 15 Hours

REFERENCES

- 1. Edited by H.Ujiie "Digital printing of Textiles", Wood head Publishing Ltd., 2006
- 2. L.W.C.Miles "Textile Printing" Society of Dyers & Colourists; 2nd revised edition, Jan 2003
- 3. R. S. Prayag, Technology of Textile Printing Noyes Data Corporation, 1989.

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U14FTIN03 WASTE ELIMINATION AND VALUE STREAM MAPPING IN APPAREL INDUSTRY

Course Outcomes

After successful completion of this course, the students should be able to

- CO1: Understand Lean concept in manufacturing perspective
- **CO2:** Gain knowledge on application of Lean Wastes concept and understand its impact on cost of poor quality in the context of apparel manufacturing industry
- **CO3:** Gain skill in application of Value Stream Mapping tool in elimination of Lean Wastes

Pre-requisites:

U14FTT505 Textile and Apparel Quality Evaluation

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO										
	1	2	3	4	5	6	7	8	9	10	11	12
CO1						Μ	Μ			Μ		
CO2		Μ				М	Μ			Μ		
CO3		Μ			Μ	Μ	Μ			Μ	М	М

Course Assessment methods:

Direct	Indirect
Continuous assessment	Course end Survey

INTRODUCTION:

Introduction to Lean concept – Comparison of Lean practice and traditional business practices - Lean practices as distinguished from TQM, Management Systems of QMS, EMS, OSHAS and TPM.

LEAN WASTES

8 Wastages - over production, higher inventory, waiting time, unnecessary conveyance and motion of materials, over processing, rework- repairs -

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3 Hours

8 Hours

rejections, customer returns, wastage of people talents. profit leakages due to wastages

Cost of Poor Quality – Cost of Quality – calculation of Cost of Poor Quality. 5 S – Seiri, Seiton, Seiso, Seiketsu, Shitsuke – house keeping practices for cleaner production.

VALUE STREAM MAPPING:

4 Hours

Identifying non – value activities in apparel manufacture – analysis and eliminating non – value activities through Value Stream Mapping (VSM)

Theory: 15 Hours

Total: 15 Hours

REFERENCES

- Gopalakrishnan N, Simplified Lean Manufacture: Elements, Rules, Tools and Implementation, Prentice Hall of India Learning Pvt. Ltd., 2010
- 2. Hobbs Dennis P,"Lean Manufacturing Implementation: A Complete Execution Manual for Any Size Manufacturer", Cengage Learning India Private Ltd, New Delhi, 2009.
- 3. Rajmanohar T P, "Lean Product Development: Concept and Models", ICFAI Press, 2009.
- 4. Desai, Aruna, "Lean manufacturing: Perspectives and Applications", ICFAI Press, 2008.
- 5. Rajmanohar T P, "Cost of Poor Quality: Concept and Applications", ICFAI Press, 2008.

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U14FTIN04 APPLICATION OF SIX SIGMA IN APPAREL MANUFACTURE

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Understand the concept of Six Sigma and its application to evaluate and control a process
- **CO2:** Gain knowledge on various metrics used in Designing Six Sigma process, implementing and for evaluating
- CO3: Implement six sigma concept in apparel industry
- CO4: Improve process by implementing Six sigma

CO5: Work and manage the industry focusing on zero defects.

Pre Requisite :

U14MAT305 Probability and Applied statistics

CO/PO Mapping												
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S											
CO2	S	S										
CO3					S							
CO4					S							
CO5							Μ					

Course Assessment methods:

Direct	Indirect
Continuous assessment	Course end Survey

DESIGN FOR SIX SIGMA (DFSS):

6 Hours

Six Sigma Basics: Overview and Implementation. Process measurement, Process analysis, Process improvement (Six Sigma and Lean concept) and Process control.

DESIGN FOR SIX SIGMA AND IMPLEMENTATION: 9 Hours Design for Six Sigma, Six Sigma implementation. Six Sigma Metrics: DPU, DPO, DPMO, Sigma levels, Yield, First Time Yield, Overall Yield,

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Throughput Yield, Rolled Throughput Yield, Normalized Yield Process Capability Indices: Cp, Cpk, Cpm, Cpkm. Dealing with non-normality through transformations.

Theory: 15 Hours

Total: 15 Hours

REFERENCES

- 1. Chowdhury, Subir, "Design for Six Sigma", Dearborn Trade, 2002.
- 2. Chowdhury, Subir, "The Power of Six Sigma", Pearson Education (Singapore) Pvt. Ltd., 2001.
- 3. Creveling C M, Sluisky J L, Antisa and Jr. D, "Design for Six Sigma Technology and Product Development", Pearson Education (Singapore) Pvt. Ltd., 2004.
- 4. Truscott William T, "Six Sigma Continual Improvement for Business: A Practical Guide", Elsevier, 2009.

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U14FTIN05 CERTIFICATION PROCEDURES FOR PRODUCT AND PROCESS IN APPAREL INDUSTRY

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Understand the different requirements of various product certification processes in Apparel Industry.
- **CO2:** Understand the different requirements of various process certification processes in Apparel Industry.
- **CO3:** Apply and follow certification procedures for health, safety and environment protection.

Pre-Requisites: NIL

CO/PO Mapping												
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1					Μ							
CO2		S			Μ					Μ		
CO3				S	Μ			S		Μ	S	Μ

Course Assessment methods:

Direct	Indirect				
Continuous assessment	Course end Survey				

PROCESS CERTIFICATION:

7 Hours

Cleaner Technology Production (CTP) - Occupational Health and Safety Assessment Specifications (OHSAS) –Worldwide Responsible for Apparel Production (WRAP) - Code of Vendor Conduct.

Global Sourcing and Operating Guidelines - Country Assessment Guidelines - Health and Safety Conditions, Human Rights Environment, Legal System, Political, Economic and Social Environment. Business Partner Terms of Engagement (TOE) - Ethical Standards, Legal Requirements, Environmental Requirements, Environmental Philosophy and Guiding Principles. Community Involvement, Employment Standards - Evaluation and Compliance.

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PRODUCT CERTIFICATION:

ECO-Labeling - Oeko-Tex 100, EU Eco-Label for Textiles. Care Labelling - Sun protective labelling - Fibre content labelling - Country of origin labelling - Product Safety Standards (Children's Nightwear and Limited Daywear Having Reduced Fire Hazard) Regulations, Accessories on infants apparel.

FABRIC CERTIFICATION UPF Rated certificate, certification for Fabrics, accessories and trims for children's nightwear and other daywear. Mandatory fabric test certification - Fibre Analysis - (Composition / Fibre Content) Construction, Yarn Count, Dimensional Stability, Shrinkage, Spirality - Tensile Strength - Tear Strength - Colour Fastness, Seam Slippage, Pilling, Stretch & Recovery for fabric with elastane - Water Repellancy, Flammability, Water Absorbency/Wicking. Product Safety Certification - Drawcords / ties, Elastic, Zippers, Broken Needle Policy, Pins Policy, Replacement Needle Policy, Shipment certification.

Theory: 15 Hours

Total: 15 Hours

REFERENCES

1. "Guidebook for Export to Japan", Japan External Trade Organization (JETRO), 2011

2. New CPSC Testing and Certification Requirements, 2012 -

www.intertek.com

3. WRAP – Production facility handbook- www.wrapcompliance.org

4. Code of Vendor Conduct, Gap Inc

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8 Hours

U14FTIN06 SEWING MACHINERY DYNAMICS

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Understand the sewing dynamics of different sewing machines
- CO2: Acquire knowledge in influence of sewing dynamics on sewing quality
- **CO3:** Acquire knowledge on apparel design and manufacturing process with respect to end use.
- **CO4:** Understand the relationship between fabric characterizations on sewing parameters.
- **CO5:** Understand the relationship between fabric characteristics and sewing parameters on seam quality.

Pre Requisite:

U14FTT402 Apparel Machinery and Equipment

U14FTP402 Apparel Machinery Laboratory

CO/PO Mapping												
(S/M/W	(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs		Programme Outcomes(POs)										
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S											
CO2	S											
CO3		S										
CO4				S								
CO5				S								

Course Assessment methods:

Direct	Indirect				
Continuous assessment	Course end Survey				

DESIGN DYNAMICS:

Apparel Engineering Relating apparel design and manufacture process to end use requirements - comfort, workmanship, appearance and appearance retention, durability, aftercare and other special functional requirements.

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5 Hours

Application of Kawabata and FAST systems for assessing fabric makingup performance.

ANALYSIS OF STITCHES AND SEAMS:

Identification of Stitches and Seams in different types of garments. Seams and their impact on product performance. Understanding of stitch types and stitch formation processes and its impact on garment performance.

SEWING DYNAMICS:

Compatibility of sewing needle and sewing thread with other sewing parameters. Understanding the structure and specifications of sewing machine needles and their importance in sewing processes. Understanding of relation between fabric characteristics and sewing process parameters.

Theory : 15 Hours

Total: 15 Hours

REFERENCES

- 1. Harold Carr and Barbara Latham, "The Technology of Clothing Manufacture", Om Book Service, 2002.
- 2. Shaeffer Claire, "Sewing for the Apparel Industry", Prentice Hall, New Jersey, 2001.
- 3. Singer, "Sewing Lingerie", Cy DeCosse Incorporated, 1991.
- 4. Laing R.M. and Webster J, "Stitches and Seams", The Textile Institute, Manchester, 1999
- 5. Technical Advisory Committee of AAMA, " A New Look at Apparel Mechanization", 1978.
- 6. Jacob Solinger, "Apparel Production Handbook", Reinhold Publications, 1998.

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5 Hours

5 Hours

DRAPING TECHNIQUES

Course Outcomes

U14FTIN07

After successful completion of this course, the students should be able to

- **CO1:** Acquire skills in selecting suitable fabric for the required design and image
- **CO2:** Understand the different draping techniques for the development of different components of the design
- **CO3:**Develop skills in creation of new designs and developing them into a three dimensional garment by draping techniques for designers and industry

Pre Requisite :

- U14FTT301 Concepts of Fashion and Design
- U14FTT303 Basic Pattern Making & Adaptation
- U14FTT304 Garment Component Fabrication
- U14FTP302 Garment Component Fabrication Lab

	CO/PO Mapping											
(S/M/	(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-											
Weak												
COs	Programme Outcomes(POs)											
	PO	PO	PO	PO	PO	PO	РО	PO	РО	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1		S	S	М		М				М		
CO2		S	S		М			М	S			
CO3		S	S	М					S	S	S	S

Course Assessment methods:

Direct	Indirect				
Continuous assessment	Course end survey				

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EXPERIMENTS:

- Effect of fabric on forms for skirts
 Type of fabric :Wovens, knits; nonwovens, non textile (Leather, paper, fusion of materials etc.)
 Weight of fabric :light weight, medium weight and heavy weight
- 2. Effect of fabric on forms for skirts Types of Silhouettes : bell & balloon, circle & triangle
- 3. Intermediate Draping : Skirts- kilt, pegged, dirndl, yoke with flare & flounces
- 4. Intermediate Draping : Blouses Bustiers, Peasant, Gibson Girl with incorporation of collar and sleeve by draping technique
- 5. Intermediate Draping : Pants -Harem, Hakama, wide leg pants
- 6. Advanced Draping : Asymmetrical and Biased drapes
- 7. Advanced Draping: Gowns -Shift & Empire

Practical : 15 Hours

Total: 15 Hours

REFERENCES

- 1. Aldrich W., Fabric, Form and Flat Pattern Cutting, Blackwell Science Ltd., London, 1996.
- 2. Crawford A.A., The Art of Fashion Draping, Om Books International, New Delhi, 2005.
- Kiisel K., Draping -the complete Course, Laurence King Publishers, 2013

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U14FTIN08 RECENT INDUSTRIAL ENGINEERING PRACTICES IN APPAREL INDUSTRY

Course Outcomes

After successful completion of this course, the students should be able to

- **CO1:** Acquire knowledge of the various industrial engineering methods and tools associated with apparel manufacturing
- **CO2:** Demonstrate modern industrial engineering methods and scientific solutions to apparel manufacturing towards economic, environmental, and societal context
- **CO3:** Practice work measurement, work place engineering and lean manufacturing in the apparel manufacturing industry

Pre Requisite:

U14FT7603 Apparel Production planning and control

U14FTT401 Apparel Production Technology

	CO/PO Mapping											
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs	Programme Outcomes(POs)											
	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	S			S	S							
CO2					S	S	S					
CO3			S				М				Μ	

Course Assessment methods:

Direct	Indirect
Continuous assessment	Course end survey

5 Hours

WORK MEASUREMENT- Operation break down, Preparation of OB (Operation bulletin), SAM Calculation, Time study, GSD.

METHOD STUDY - Motion analysis of the operations, Ergonomics

5 Hours

WORK PLACE ENGINEERING – Machine Layout and Work station layout, Equipment Technology. Operation Management - Line Set up, Production estimation of a line, WIP Control, Line Balancing, Developing and Maintaining Skill Matrix, Calculating Thread Consumption,

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5 Hours

Capacity planning, Cost estimation of a garment. Performance Rating, Incentives schemes. Lean Manufacturing - Value stream mapping, Sixsigma, Zero defects. Pneumatic Controls and Robotics

Theory : 15 Hours

Total: 15 Hours

REFERENCES:

- 1. V.Ramesh Babu, "Industrial Engineering in Apparel Production", Wood head Publishing Ltd., 2011
- 2. www.onlineclothingstudy.com
- 3. Guidelines for Industrial Engineering, KSA Technopak
- 4. Improving Working Conditions and Productivity in the Garment Industry: An Action Manual International Labour Org.
- 5. Dennis P. Hobbs "Lean Manufacturing Implementation: A Complete Execution Manual for any Size Manufacturer", Cengage Learning India Pvt., Ltd, New Delhi, 2004.

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