KUMARAGURU COLLEGE OF TECHNOLOGY, COIMBATORE – 641 049

REGULATIONS 2017

CURRICULUM & SYLLABUS

I- VIII Semesters

Department of Fashion Technology

Version 1 (17.8.17)

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.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

I. To provide strong foundation to graduates to pursue a **successful profession or higher studies**

II. 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.

III. To imbibe awareness among graduates on the significance **of professional and social ethics** in their professional career.

PROGRAM OUTCOMES

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

(B) PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO-1: Apply apparel domain knowledge to provide techno-economic solutions to industrial requirements

PSO-2: Develop sustainable and ethical apparel products and processes to meet the diversified needs of the apparel industry

KUMARAGURU COLLEGE OF TECHNOLOGY

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REGULATIONS 2017

B.TECH FASHION TECHNOLOGY

CURRICULUM

SEMESTER-I

Course Code	Course Title	Course category	Course Mode	L	T	P	J	C
U17ENI1201	English for Cognizance	HS	Embedded	1	0	2	0	2
U17MAT1103	Algebra and Differential Equations	BS	Theory	3	1	0	0	4
U17PHT1008	Physics for Fashion Technology	BS	Theory	3	0	0	0	3
U17CHT1006	Chemistry for Textiles	BS	Theory	3	0	0	0	3
U17FTT1001	Fibre Science	PC	Theory	3	0	0	0	3
U17MET1101	Engineering Graphics	ES	Theory	2	1	0	0	3
U17FTP1501	Fibre Analytical Laboratory	PC	Lab	0	0	2	0	1
U17CHP1501	Chemistry Laboratory	BS	Lab	0	0	2	0	1
U17MEP1501	Engineering Practices Laboratory	ES	Lab	0	0	2	0	1
U17VEP1501	Personal Values	HS	Lab	0	0	2	0	1
Total Credits								**22**
Total Hours per week								**27**

SEMESTER-II

Course Code	Course Title	Course category	Course Mode	L	T	P	J	C
U17ENE21--	Language elective	HS	Lab	0	0	4	0	2
U17MAT2103	Advanced Calculus and Numerical Methods	BS	Theory	3	1	0	0	4
U17PHT2006	Material Science for Fashion Technology	BS	Theory	3	0	0	0	3
U17CHT2009	Polymer Chemistry	BS	Theory	3	0	0	0	3
U17CSI2211	Structured Programming using C	ES	Embedded	3	0	2	0	4
U17FTT2001	Yarn Technology	PC	Theory	3	0	0	0	3
U17PHP2501	Physics Labortory	BS	Lab	0	0	2	0	1
U17ISR2001	Social Immersion Project	eRIDE	Project	0	0	0	4	2
U17VEP2502	Inter-Personal values	HS	Lab	0	0	2	0	1
Total Credits								**23**
Total Hours per week								**30**

Semester III										Pre-requisite
S.No	**Course code**	**Course Title**	**Course Mode**	**CT**	**L**	**T**	**P**	**J**	**C**	
1	U17EEI3206	Basic Electrical and Electronics Engineering	Embedded-Theory& Lab	ES	3	0	2	0	4	Nil
2	U17FTT3001	Weaving Technology	Theory	PC	3	0	0	0	3	Nil
3	U17FTI3202	Concepts of Fashion and Design	Embedded - Theory & Lab	PC	3	0	2	0	4	Nil
4	U17FTT3003	Pattern Making and Adaptation	Theory	PC	3	0	0	0	3	Nil
5	U17FTI3204	Garment Components Fabrication	Embedded - Theory & Lab	PC	3	0	2	0	4	Nil
6	U17INI3600	Engineering Clinic I	Project based course	ES	0	0	4	2	3	Nil
								Total Credits	**21**	
								Total Contact Hours/week	**27**	

Semester IV										Pre-requisite
S.No	**Course code**	**Course Title**	**Course Mode**	**CT**	**L**	**T**	**P**	**J**	**C**	
1	U17MAT4102	Probability and Statistics	Theory and Tutorial	BS	3	1	0	0	4	Nil
2	U17MET4007	Basics of Mechanical Engineering	Theory	ES	3	0	0	0	3	NIL
3	U17FTT4001	Apparel Machinery and Equipment	Theory	PC	3	0	0	0	3	NIL
4	U17FTI4202	Apparel Design and Development	Embedded - Theory & Lab	PC	3	0	2	0	4	U17FTI3204
5	U17FTI4203	Fabric Structure and Design	Embedded - Theory & Lab	PC	3	0	2	0	4	U17FTT3001
6	U17INI4600	Engineering Clinic II	Project based course	ES	0	0	4	2	3	Nil
								Total Credits	**21**	
								Total Contact Hours/week	**26**	

Semester V										Pre-requisite
S.No	**Course code**	**Course Title**	**Course Mode**	**CT**	**L**	**T**	**P**	**J**	**C**	
1	U17MAT5102	Discrete Mathematics	Theory and Tutorial	BS	3	1	0	0	4	Nil
2	U17FTI5201	Textile Chemical Processing	Embedded - Theory & Lab	PC	3	0	2	0	4	Nil
3	U17FTI5202	Textile and Apparel Quality Evaluation	Embedded - Theory & Lab	PC	3	0	2	0	4	Nil
4	U17FTT5003	Knitting Technology	Theory	PC	3	0	0	0	3	U17FTT1001
5	U17FTP5504	Apparel Production Lab	Lab	PC	0	0	2	0	1	U17FTI4202
6	U17OE…..	Open Elective I	Theory	OE	3	0	0	0	3	Nil
7	U17INI5600	Engineering Clinic III	Project based course	ES	0	0	4	2	3	Nil
8	U17FTP5505	Industrial Training*	Industry	PC	0	0	2	0	1	NIL
								Total Credits	**23**	
								Total Contact Hours/week	**30**	

*Industrial training to be undertaken during the 4th Semester summer vacation –Internal evaluation

Semester VI										Pre-requisite
S.No	**Course code**	**Course Title**	**Course Mode**	**CT**	**L**	**T**	**P**	**J**	**C**	
1	U17FTT6001	Apparel Production Planning and Control	Theory	PC	3	0	0	0	3	U17FTT4001
2	U17FTT6002	Apparel Merchandising and Cost Management	Theory	PC	3	0	0	0	3	Nil
3	U17FTT6003	Industrial Engineering in Apparel Industry	Theory	PC	3	0	0	0	3	U17FTI3204
4	U17FTE….	Programme Elective I	Theory	PE	3	0	0	0	3	Nil
5	U17OE…..	Open Elective II	Theory	OE	3	0	0	0	3	Nil
6	U17FTE….	Programme Elective II	Theory	PC	3	0	0	0	3	Nil
7	U17FTP6504	Apparel CAD lab	Lab	PC	0	0	2	0	1	U17FTI4202
8	U17FTP6505	Portfolio Presentation I	Lab	PC	0	0	2	0	1	U17FTI4202
9	U17INI6600	Engineering Clinic IV	Project based course	ES	0	0	4	2	3	Nil
								Total Credits	**23**	

									Total Contact Hours/week	**28**	
Semester VII											**Pre-requisite**
S.No	**Course code**	**Course Title**	**Course Mode**	**CT**	**L**	**T**	**P**	**J**	**C**	
1	U17FTT7001	Apparel Brand Management	Theory	PC	3	0	0	0	3	Nil
2	U17FTT7002	Apparel Retail Management	Theory	PC	3	0	0	0	3	Nil
3	U17FTE….	Programme Elective III	Theory	PE	3	0	0	0	3	Nil
4	U17FTE….	Programme Elective IV	Theory	PE	3	0	0	0	3	Nil
5	U17FTP7503	Portfolio Presentation II	Lab	PC	0	0	2	0	1	U17FTP5504
6	U17FTP7701	Project- Phase I	Project only Course	PW	0	0	0	6	3	NIL
									Total Credits	**16**	
									Total Contact Hours/week	**20**	

Semester VIII										**Pre-requisite**
S.No	**Course code**	**Course Title**	**Course Mode**	**CT**	**L**	**T**	**P**	**J**	**C**	
1	U17FTP8701	Project- Phase II	Project only Course	PW	0	0	0	24	12	U17FTP7701
									Total Credits	**12**	
									Total Contact Hours/week	**24**	

List Of Mandatory Courses

S.No	Couse Code	Course Title	Course Mode	CT	Sem
1	U17VEP1501	Human Excellence -Personal Values	Lab	HS	1
2	U17VEP2502	Human Excellence-Inter Personal values	Lab	HS	2
3	U17VEP3503	Human Excellence-Family Values	Lab	HS	3
4	U17CHT3000	Environmental Science and Engineering	Theory	MC	3
5	U17VEP4504	Human Excellence-Professional Values	Lab	HS	4
6	U17IST4000	Constitution of India	Theory	MC	4
7	U17VEP5505	Human Excellence-Social Values	Lab	HS	5
8	U17VEP6506	Human Excellence-National Values	Lab	HS	6
9	U17VEP7507	Human Excellence-Global Values	Lab	HS	7

Programme Electives									
S.No	**Course code**	**Course Title**	**Course Mode**	**CT**	**L**	**T**	**P**	**J**	**C**
Fashion designing									
1	U17FTE0001	Apparel Product Development	Theory	PE	3	0	0	0	3
2	U17FTE0002	Surface Ornamentation	Theory	PE	3	0	0	0	3
3	U17FTE0003	Visual Merchandising	Theory	PE	3	0	0	0	3
4	U17FTE0004	Fashion Boutique Management	Theory	PE	3	0	0	0	3

Apparel Technology									
1	U17FTE0005	Clothing Science for Apparel Engineering	Theory	PE	3	0	0	0	3
2	U17FTE0006	Apparel Finishing and Care	Theory	PE	3	0	0	0	3
3	U17FTE0007	Functional Clothing	Theory	PE	3	0	0	0	3
4	U17FTE0008	ERP and MIS in Apparel Industry	Theory	PE	3	0	0	0	3
Apparel Management									
1	U17FTE0009	Fashion Marketing	Theory	PE	3	0	0	0	3
2	U17FTE0010	Social Compliance in Apparel Industry	Theory	PE	3	0	0	0	3
3	U17FTE0011	Global Marketing and Sourcing Strategies	Theory	PE	3	0	0	0	3
4	U17FTE0012	Logistics and Supply chain Management	Theory	PE	3	0	0	0	3

LIST OF ONE CREDIT COURSES

S.No	Couse Code	Course Title
1	U17FTC0001	Computer Aided Textile and Apparel Designing
2	U17FTC0002	Draping Techniques
3	U17FTC0003	Sewing Machinery Dynamics
4	U17FTC0004	Developments in Sewing Machinery
5	U17FTC0005	New Trends in Printing
6	U17FTC0006	Industrial Engineering Practices In Apparel
7	U17FTC0007	Application of Six Sigma in Apparel Manufacture
8	U17FTC0008	Waste Elimination and Value Stream Mapping In Apparel Industry
9	U17FTC0009	Certification Procedures for Product And Process in Apparel Industry
10	U17FTC0010	Statistical Analysis in the Apparel Industry
11	U17FTC0011	Computer colour matching and printing techniques
12	U17FTC0012	Fashion illustration marvelous designer and fashion draping
13	U17FTC0013	Costing procedure for garments
14	U17FTC0…	

LIST OF OPEN ELECTIVE COURSES

Sl.No	Course Code	Course Name
1	U17FTO0001	Fashion Photography
2	U17FTO0002	Textile Arts and Crafts
3	U17FTO0003	Home Furnishing and Decoration for Beginners
4	U17FTO0004	Creative Art and Crafts
5	U17FTO0…..	

SEMESTER - I

Version 1 (17.8.17)

U17ENI1201 **English for Cognizance**

L	T	P	J	C
1	0	2	0	2

(Common to all branches of Engineering and Technology)

Course Outcomes

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

CO1: Understand and appreciate vocabulary and syntax with accuracy and clarity.

CO2: Communicate effectively by using appropriate grammar and technical parlance in a range of academic scenarios.

CO3: Interpret and critically evaluate discourses related to functional English.

CO4: Comprehend critical text leading to academic articulation.

CO5: Disseminate professional information through appropriate means of communication.

CO6: Demonstrate an understanding for innovative language learning strategies and write texts applying registers formats and language appropriate to the context.

Pre-requisites : NIL

CO/PO Mapping

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	W	M				W			M	S		M
CO2		W	M		W	S		W	M	S		S
CO3	W	S				W	W			S		M
CO4		M								S		M
CO5		S				W			M	S		S
CO6		W				W			W	S		S

Course Assessment methods

Direct
1. Continuous Assessment Test I 2. Open book test 3. Assignment 4. End Semester Examination
Indirect
1. Course-end survey

INTRODUCTION TO LITERARY SKILLS 9 Hours

Parts of Speech – Word Formation – Homonyms - Homophones and Homographs, One Word Substitutes, Acronyms and Abbreviations, Reading Aloud, Quick Reading, Sequencing of jumbled sentences, Reading to Predict.

TECHNICAL NUANCES 9 Hours

Tense, Voice, Kinds of Syntax, Gerund and Infinitives, Cause and effect expressions, Purpose and functional expressions, Conditional clauses, Reported speech, Diary Writing, Editing (Grammar – Concord, Articles, Parts of Speech, Modifiers – Dangling participles, Misplaced, Squinting and Punctuation).

COMPREHENSION AND ANALYSIS **9 Hours**

Sub Skills of Reading, Reading Comprehension, Text Visualization, Peer Reading, Cloze Test, Inferring Technical Texts, Reading a Travelogue, Reading for Interrogation, Reading to Respond, Note making – Linear and Non-linear.

PRACTISING LITERARY SKILLS **9 Hours**

Instructions and Recommendations, Discourse markers – Process description, Writing a Paragraph – Descriptive, Narrative, Compare and Contrast, Persuasive, Creative Writing, Critical Reading, Twirl Reading, Google Reading.

TECHNICAL CORRESPONDENCE **9 Hours**

Technical Discourse, Modules of a letter, Professional Letters, Industrial Visit/ In-plant Training, Basics of E-Mail writing and E-mail etiquette, Writing Notices, Circulars, Memo and Notes, Report writing

Theory: 15	Tutorial: 0	Practical: 30	Project: 0	Total: 45 Hours

REFERENCES

1. English for Engineers—Regional Institute of English, South India, Bangalore, published by Foundation Books, Chennai.
2. Effective Technical Communication—A Guide for Scientists and Engineers—BarunK. Mitra—Oxford University Press, New Delhi.
3. Interchange, Fourth Edition—Jack.C.Richards et.al,--Cambridge University Press, Sri Maitrey Print Tech., Noida.

U17MAT1103 **Algebra and Differential Equations (Common to Bio, FT)**

L	T	P	J	C
3	1	0	0	4

Course Outcomes

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

CO1: Identify eigen values and eigen vectors of matrices and examine the consistency of system of linear equations. K4

CO2: Estimate the convergence of infinite series through various methods. K4

CO3: Solve first order ordinary differential equations of certain types and apply in some physical situations.K3

CO4: Apply numerical techniques to solve first order ordinary differential equations. K3

CO5: Identify the solution of the higher order ordinary differential equations using various methods. K4

CO6: Know how to find the Fourier Series and half range Fourier Series of a function given explicitly and to find Fourier Series of numerical data using harmonic analysis. K4

Pre-requisites :

Nil

CO/PO Mapping

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	M							M	M		
CO2	S	M							M	M		
CO3	S	M							M	M		
CO4	S	M							M	M		
CO5	S	M							M	M		
CO6	S	M							M	M		

Course Assessment methods

Direct

1. Continuous Assessment Test I, II
2. Open book test; Cooperative learning report, Assignment; Journal paper review, Group Presentation, Project report, Poster preparation, Prototype or Product Demonstration etc (as applicable)
3. End Semester Examination

Indirect

1. Course-end survey

MATRICES 8 + 2 Hours

Rank of a matrix – Linearly dependent and independent vectors – System of linear equations-Consistency-Rouche's theorem - Solution - Eigen values and eigenvectors of a real matrix – Properties of eigen values and eigenvectors – Cayley Hamilton theorem (excluding proof).

SEQUENCE AND SERIES **10 + 3 Hours**

Sequences: Definition and examples–Series: Types and Convergence–series of positive terms–Tests of convergence: Comparison test, Integral test and D'Alembert's ratio test–Alternating series–Leibnitz's test–Series of positive and negative terms–Absolute and conditionalconvergence.

FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS **5 + 2 Hours**

Leibnitz's equation – Bernoulli's equation–Applications: Exponential growth and decay- Electric circuit problems.

NUMERICAL SOLUTION OF FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS **4 + 2 Hours**

Numerical methods for solving first order ordinary differential equations: Taylor series method - Fourth order Runge-Kutta method.

HIGHER ORDER LINEAR DIFFERENTIAL EQUATIONS **8 +3 Hours**

Linear equations of second and higher order with constant coefficients – Non-homogeneous term of the type e^{ax}, Sin*ax*, Cos*ax* and x^n, $e^{ax}V(x)$. Euler's and Legendre's linear equations – Method of variation of parameters.

FOURIER SERIES **10 +3 Hours**

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

Theory: 45	**Tutorial: 15**	**Practical: 0**	**Project: 0**	**Total: 60 Hours**

REFERENCES

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 41st Edition.
2. Veerarajan T., Engineering Mathematics (for First Year), Tata McGraw Hill Pub. Co. Ltd., New Delhi, Revised Edition, 2007.
3. Bali N. P and Manish Goyal, "A Text book of Engineering Mathematics", Eighth Edition, Laxmi Publications Pvt Ltd., (2011).
4. Kreyzig E., "Advanced Engineering Mathematics", Eighth Edition, John Wiley and sons, 2010.
5. Arunachalam, T., Engineering Mathematics I, Sri VigneshPublications, 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).
8. Veerarajan T., "Engineering Mathematics" (for semester III), Third Edition, Tata McGraw Hill, New Delhi (2007)
9. Kandasamy P., Thilagavathy K. and Gunavathy K., "Numerical Methods", S.Chand Co. Ltd., New Delhi, 2007
10. www.mathworld.wolfram.com

U17PHT1008 Physics for Fashion Technology

L	T	P	J	C
3	0	0	0	3

Course Outcomes

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

CO1: Analyze and identify the crystal structure in materials

CO2: Imbibe the concept of laser for its application in engineering.

CO3: Categorize the optical fiber and apply it for various fields.

CO4: Acquire the basic knowledge in quantum mechanics

CO5: Describe the impact of acoustic engineering solutions in a constructional, environmental, and societal context.

CO6: Apply the concepts of ultrasonics and NDT necessary for engineering practice.

Pre-requisites :

NIL

CO/PO Mapping

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	M										M
CO2	S	M			S							M
CO3	S	M			S							M
CO4	S	M			S							M
CO5	S	M			S							M
CO6	S	M					M					M

Course Assessment methods

Direct
1. Continuous Assessment Test I, II 2. Group Presentation, Project report, Poster preparation 3. End Semester Examination
Indirect
1. Course-end survey

9 Hours

CRYSTAL PHYSICS

Space lattice – unit cell – lattice planes – Bravais space lattices – Miller indices – calculation of inter-planar 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 **9 Hours**

Lasers: Introduction - Spontaneous and stimulated emissions – Einstein's coefficients Types of laser – Nd : YAG; CO_2 and semiconductor laser (Qualitative only) - applications – CD-ROM and holography (qualitative only).

Optical fibre: Principle and propagation of light in optical fibers – Numerical aperture and acceptance angle – types of optical fibers – applications – fibre optic communication system

QUANTUM PHYSICS **9 Hours**

Introduction - Planck's quantum theory of black body radiation (derivation) - photo electric

effect (qualitative description only) - Compton effect (derivation) and experimental verification of Compton effect - De-Broglie's concept - Schrodinger wave equation - time independent and time dependent equations (derivations) - physical significance of wave function - particle in a box (one dimensional case).

ACOUSTICS **9 Hours**

Introduction - classification of sound – characteristics of musical sound –loudness –Weber-Fechner law –decibel- Reverberation – reverberation time –Sabines formula for reverberation time (Qualitative only) –Absorption coefficient and its determination – factors affecting acoustics of buildings –optimum reverberation time, loudness, focusing, echo, echelon effect, resonance and noise and their remedies.

ULTRASONICS AND NDT **9 Hours**

Introduction - production — magnetostriction generator – piezo electric generator –properties – detection – acoustic grating – velocity measurement – applications –SONAR

NDT – liquid penetrant method – ultrasonic flaw detector – A scan, B scan and C scan – X- ray radiography and fluoroscopy – thermography.

Theory: 45	**Tutorial: 0**	**Practical: 0**	**Project: 0**	**Total: 45 Hours**

REFERENCES

1. Calister, "Material Science and Engineering: An Introduction", 7th Edition, John Wiley and Sons, 2006.
2. Avadhanulu M.N. and Kshirsagar P.G., A textbook of Engineering Physics, S.Chand& Company Ltd, New Delhi,2005.
3. Gaur R.K. and Gupta S.L., Engineering Physics, 8th edition, DhanpatRai Publications (P) Ltd., New Delhi, 2003.
4. Palanisamy P.K., Engineering Physics I, Scitech Publications, Chennai, 2011.
5. Halliday, D., Resnick, R. & Walker, J. "Principles of Physics". Wiley, 2015.
6. Rajendran V, Applied Physics, Tata McGraw Hill Publishing Company Limited, New Delhi, 2003.
7. Gopal S., Engineering Physics, Inder Publications, Coimbatore, 2006.
8. Bhattacharya, D.K. & Poonam, T. "Engineering Physics". Oxford University Press, 2015. 2

U17 CHT1006 **Chemistry for Textiles**

L	T	P	J	C
3	0	0	0	3

Course Outcomes

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

CO1: Design a water purifier (K4)
CO2: Discuss the adsorption and its application (K2)
CO3: Describe interaction in fibers (K2)
CO4: Analyse the chemical group present and classify the dyes (K3)
CO5: Analyse the usage of speciality chemicals in various applications (K2)
CO6: Discuss different additives used for polymers in textiles (K2)

Pre-requisites :

NIL

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

COs	Programme Outcomes(POs)											
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	M					M						
CO2	M											
CO3	W	M				M						
CO4	S		M			M						
CO5	S											
CO6	M											

Course Assessment methods

Direct
1. Continuous Assessment Test I, II 2. Open book test; Cooperative learning report, Assignment; Journal paper review, Group Presentation, Project report, Poster preparation, Prototype or Product Demonstration etc (as applicable) 3. End Semester Examination
Indirect
1. Course-end survey

WATER TECHNOLOGY 9 Hours

Disadvantages of Hard water: In textile industries - as boiler feed water - formation of deposits in steam boilers and heat exchangers, wastage of fuel, decrease in efficiency of boilers, priming, foaming, caustic embrittlement, boiler corrosion.

Prevention of scale formation: External treatment (Ion exchange method) - Internal treatment (colloidal, phosphate, calgon and carbonate conditioning) - Desalination (Reverse osmosis and electrophoresis) - Domestic water treatment and effluent treatment.

SURFACE CHEMISTRY 9 Hours

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

CHEMICAL BONDING **9 Hours**

Ionic, covalent and co-ordinate covalent bonds (overview only) - hydrogen bonding and its consequences - VanderWaal'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 **9 Hours**

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

ANTHOLOGY OF SPECIALITY CHEMICALS IN TEXTILES AND ADDITIVES FOR POLYMERS IN TEXTILES **9 Hours**

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

Additives for polymers:

Moulding constituents - fillers, plasticizers, lubricants, anti-aging additives, antioxidants, antiozonants, UV stabilizers, blow agents, crosslinking agents.

Theory: 45	**Tutorial: 0**	**Practical: 0**	**Project: 0**	**Total: 45 Hours**

REFERENCES

1. Amarika Singh, *Vairam S.and* Suba Ramesh., Chemistry for Engineers., Wiley India Ltd., New Delhi, 2010
2. Syed Shabudeen, P.S. and Shoba U.S., Chemistry for Textiles, Inder Publishers, Coimbatore, 2014
3. Finar I.L, Organic chemistry, Pearson Publishers, UK, 2012
4. Hungar K., Industrial Dyes - Chemistry, properties and applications, Wiley VCH Verlag GmbH & Co., KGaA, Weinheim., 2004
5. Gowariker V.R, Viswanathan N.V. and Sreedhar J, Polymer Science, New Age International P (Ltd.,), Chennai, 2016.
6. Seymour R.B. and Carraher C.E. Jr, Polymer chemistry, 6th Edition, Plenum Pub. Corporation, New York, 2003.
7. Sivaramakrishnan C.N., Anthology of speciality chemicals for textiles, Colour Pub. (P) Ltd., Mumbai, India, 2007
8. Bahl B.S. and Arun Bahl., Advanced *Organic Chemistry*, S. Chand & Co., New Delhi, 2014

U17FTT1001 Fibre Science

L	T	P	J	C
3	0	0	0	3

Course Outcomes

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

CO1: Recognize the Essential and desirable properties of fibres K_2
CO2: Understand the Cultivation of Natural fibres K_2
CO3: Understand the production of Man – made fibres K_2
CO4: Understand the Properties of natural, man-made fibres K_2
CO5 : Understand the Properties and application of specialty fibres K_3
CO6: Application of the properties to Identify different natural and man-made fibres K_3

Pre-requisites : NIL

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

COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	S												S	S
CO2	S												S	S
CO3	S												S	S
CO4	S												S	S
CO5	S												S	S
CO6		S											S	

Course Assessment methods

Direct
1. Continuous Assessment Test I, II 2. Open book test; Cooperative learning report, Assignment; Journal paper review, Group Presentation, Project report, Poster preparation, Prototype or Product Demonstration etc (as applicable) 3. End Semester Examination
Indirect
1. Course-end survey

INTRODUCTION TO TEXTILE FIBRES 12 Hours

Definition of various forms of textile fibres - staple fibre, filament, bicomponent fibres. Classification of Natural and Man-made fibres, essential and desirable properties of Fibres. Introduction to fibre linear density and strength - units of measurements. Production and cultivation of Natural Fibers: Cotton, Silk, Wool, Flax, Jute -Physical and chemical structure of the above fibres.

MANUFACTURED FIBRES 10 Hours

Production Sequence of Regenerated Cellulosic fibres: Viscose Rayon, Acetate rayon – High wet modulus fibres: Modal and Lyocel -.Production Sequence of Synthetic Fibers: Polyester, Nylon and Acrylic. Introduction to spin finishes and texturisation.

BASIC FIBRE PROPERTIES **8 Hours**

Physical (Tensile, Moisture, Density), Chemical, Biological, Thermal and Optical Properties of the above Natural, and manufactured fibres.

SPECIALITY FIBRES **8 Hours**

Properties and end uses of high tenacity and high modulus fibres, high temperature and flame retardant fibres, elastomeric fibres, PLA fibre, ultra-fine fibres, nano-fibres, metallic fibres – Gold and Silver coated; Super-absorbent fibres for medical and hygiene applications.

IDENTIFICATION OF TEXTILE FIBERS **7 Hours**

Appearance (Microscopic view, Colour), Solubility, density and Burning tests.

Theory: 45	Tutorial: 0	Practical: 0	Project: 0	Total: 45 Hours

REFERENCES

1. Mishra S.P.,"Fibre Science & Technology", New Age International Publishers, 2000.
2. Morton, W.E and Hearle, J.W.S., "Physical Properties of Textile Fibres", The Textile Institute, Manchester, U.K., 1993.
3. Muthopadhyay S.K., "Advances in Fibre Science", The Textile Institute, UK 1992.
4. Collier. B and Tortora.P, "Understanding Textiles", Edition 6, Prentice Hall, 2001.
5. Gupta V.B., "Textile Fibres: Developments and Innovations", Vol. 2, Progress in Textiles: Science & Technology, Edited by V.K. Kothari, IAFL Publications, 2000.
6. Corbman B.P., "Textiles: Fibre to Fabric", McGraw Hill International Edn,1983

U17MET1101 **Engineering Graphics**

L	T	P	J	C
2	1	0	0	3

Course Outcomes

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

CO1: Construct various plane curves.
C02: Construct projection of points and projection of lines.
CO3: Develop projection of surfaces and solids.
CO4: Solve problems in sections of solids and development of surfaces.
CO5: Apply the concepts of isometric, and perspective projections
CO6: Apply free hand sketching in engineering practice.

Pre-requisites : Nil

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	M										
CO2	S	S									W	
CO3	S	S									M	
CO4	S	S										
CO5	S											
CO6	S											

Course Assessment methods

Direct

1. Continuous Assessment Test I, II (Theory component)
2. Open book test; Cooperative learning report, Assignment; Journal paper review, Group Presentation, Project report, Poster preparation, Prototype or Product Demonstration etc (as applicable) (Theory component)
3. End Semester Examination (Theory component)

Indirect

1. Course-end survey

PLANE CURVES, PROJECTION OF POINTS AND LINES **6+3 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 **6+3 Hours**

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 6+3 Hours

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 6+3 Hours

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 6+3 Hours

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.

Theory: 30	**Tutorial: 15**	**Practical: 0**	**Project: 0**	**Total: 45 Hours**

REFERENCES

1. Bhatt ND, Engineering Drawing, Charotar Publishing house, 54th edition, 2014.
2. Venugopal K. and Prabhu Raja V., Engineering Graphics, New Age International (P) Limited, New Delhi, 2016.
3. Nataraajan K.V., Engineering Drawing and Graphics, Dhanalakshmi Publisher, Chennai, 2006.
4. Basant Agrawal and Agrawal C.M, Engineering Drawing and Graphics,McGraw Hill Edition(India), 2013.
5. Gopalkrishna K.R., Engineering Drawing (Vol. I & II), Subhas Publications, 2014.

U17FTP1501 Fibre Analytical Laboratory

L	T	P	J	C
0	0	2	0	1

Course Outcomes

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

CO1:Ability to identify the given fibre by microscopical examination (K_3)
CO2:Ability to identify the given fibre by solubility Test (K_3)
CO3:Ability to identify the given fibre by Flammability Test (K_3)
CO4:Ability to identify cotton and viscose by alkali swelling Test (K_3)
CO5:Acquire Skill to determine the blend proportion(K_3)
CO6:Acquire Skill to determine the fibre physical properties(K_3)

Pre-requisites : NIL

CO/PO Mapping

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

COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	S	S											S	S
CO2	S	S											S	S
CO3	S	S											S	S
CO4	S	S											S	S
CO5	S	S											S	S
CO6	S	S											S	S

Course Assessment methods

Direct
1. Pre-or Post-experiment Test/Viva; Experimental Report for each experiment; Comprehensive report / Model Examination 2. End Semester Examination
Indirect
1. Course-end survey

List of Experiments 30 Hours

1. Study of longitudinal view of natural and synthetic fibres
2. Study of cross-sectional view of natural and synthetic fibres
3. Identification of fibres through flammability tests
4. Identification of fibres through solubility tests
5. Determination of fibre density
6. Study of swelling behaviour of cotton and viscose in alkaline solution
7. Determination of blend proportion of blends
8. Determination of moisture regain of fibres
9. Determination of fineness of fibre

10. Estimation of Trash cotton in cotton fibre
11. Determination of fibre strength and elongation.
12. Determination of fibre l e n g t h

Theory: 0	Tutorial: 0	Practical: 30	Project: 0	Total: 30 Hours

U17CHP1501 Chemistry Laboratory
(COMMON TO ECE, E&I, EEE, FT & ME)

L	T	P	J	C
0	0	2	0	1

Course Outcomes

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

CO1: Prepare standard solutions (S1)

CO2: Analyse the properties of water by applying the chemical concepts (S2)

CO3: Analyse the solutions by electrochemical techniques and apply it in real life situations like corrosion, soil, water testing etc (S2)

CO4: Analyse the solutions by spectroscopic techniques and apply it in real life situations like corrosion, soil, water testing etc (S2)

Pre-requisites :

NIL

CO/PO Mapping

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M											
CO2	M											
CO3	M					M						
CO4	M					M						

Course Assessment methods

Direct
1. Post-experiment Test/Viva; Experimental Report for each experiment; Model Examination 2. End Semester Examination
Indirect
1. Course-end survey

LIST OF EXPERIMENTS **30 Hours**

1. Preparation of normal solutions of the following substances - Sodium carbonate, Hydrochloric acid and Buffer solution

WATER TESTING

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

ELECTRO CHEMICAL ANALYSIS

6. Estimation of hydrochloric acid by pHmetry.
7. Conductometric estimation of mixture of acids and strong base

8. Estimation of corrosion of Iron by Potentiometry

PHOTOMETRY

9. Estimation of the extent of dissolution of Copper / Ferrous ions by Spectrophotmetry.
10. Estimation of sodium and potassium in water by Flamephotometry.

DEMONSTRATION

11. Determination of Fire point and Flash point
12. Determination of Cloud and Pour point
13. Microscopic usage in Metallurgy.
14. Determination of Molecular weight by Viscometer

Theory: 0	Tutorial: 0	Practical: 30	Project: 0	Total: 30 Hours

REFERENCES

1. Jeffery G.H., Bassett J., Mendham J. and Denny R.C., Vogel's Text Book of Quantitative Chemical Analysis, Oxford, ELBS, London,2012.
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, 2011.

U17MEP1501 Engineering Practices Laboratory

L	T	P	J	C
0	0	2	0	1

Course Outcomes

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

CO1: Select the various tools and equipment's used in the fabrication workshop.
CO2: Develop various models in carpentry and fitting
CO3: Make components using sheet metal work.
CO4: Select the various tools and joints for different applications in plumbing.
CO5: Demonstrate and evaluate the parameters of basic electronic components (wires, resistors, capacitors, diodes etc.) and test the components.
CO6: Estimate DC and AC Voltage and currents using appropriate measuring instruments.

Pre-requisites :

Nil

	CO-PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak											
COs	**Programme Outcomes(POS)**											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S											
CO2					M							
CO3			M									
CO4						W						
CO5	M											
CO6	M											

Course Assessment methods

Direct
1. Pre-or Post-experiment Test/Viva; Experimental Report for each experiment; Comprehensive report / Model Examination 2. End Semester Examination
Indirect
1. Course-end survey

List of Experiments **30 Hours**

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
   - Preparation of tray

GROUP - II (ELECTRICAL & ELECTRONICS ENGINEERING)

C. ELECTRICAL ENGINEERING PRACTICE

1. Residential house wiring using switches, fuse, indicator, lamp and energy meter.
2. Fluorescent lamp wiring.
3. Stair-case wiring.
4. Measurement of electrical quantities–voltage, current, power & Power factor in RLC circuit.
5. Measurement of energy using single phase energy meter.

D. ELECTRONIC ENGINEERING PRACTICE

1. Testing of Electronic components and Measurements using a digital multimeter.
2. Study of CRO and Function generator.
3. PCB Design and Fabrication.
4. Soldering simple electronic circuits and checking continuity

Theory: 0	**Tutorial: 0**	**Practical: 30**	**Project: 0**	**Total: 30 Hours**

U17VEP1501 **Personal Values**

L	T	P	J	C
0	0	2	0	1

Course Outcomes

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

CO 1: Become an individual in knowing the self
CO 2: Acquire and express Gratitude, Truthfulness, Punctuality, Cleanliness & fitness.
CO 3: Practice simple physical exercise and breathing techniques
CO 4: Practice Yoga asana which will enhance the quality of life.
CO 5: Practice Meditation and get benefited.
CO 6: Procure Self Healing techniques for propagating healthy society

Pre-requisites : Nil

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												M
CO2										S		
CO3						M						
CO4						S			M			
CO5										M		
CO6								W				S

Course Assessment methods

Direct
1. Group Activity / Individual performance and assignment 2. Assessment on Value work sheet / Test
Indirect
1. Mini project on values / Goodwill Recognition

VALUES THROUGH PRACTICAL ACTIVITIES: **30 Hours**

1.Knowing the self : Introduction to value education - Need & importance of Value education – Knowing the self – realization of human life – animal instinct vs sixth sense.

2. **Mental Health :**Evolution of senses – functioning steps of human mind – Body and Mind coordination - Analysis of thoughts – moralization of desires– auto suggestions – power of positive affirmations. – Meditation and its benefits.

3.Physical Health: Physical body constitution– Types of food - effects of food on body and mind – healthy eating habits – food as medicine– self healing techniques.

4.Core value : Self love& Self care Gratitude - Happiness - Optimistic –Enthusiasm –

Simplicity – Punctual - Self Control - Cleanliness & personal hygiene - Freedom from belief systems.

5.Fitness: Simplified physical exercises – Sun salutation - Lung strengthening practices: Naadi suddhi pranayama – Silent sitting and listening to nature – Meditation.

Theory: 0	Tutorial: 0	Practical: 30	Project: 0	Total: 30 Hours

REFERENCES

1. KNOW YOURSELF — SOCRATES – PDF format at

   www.au.af.mil/au/awc/awcgate/army/rotc_self-aware.pdf

2. STEPS TO KNOWLEDGE: The Book of Inner Knowing – PDF format at

   www.newmessage.org/wp-content/uploads/pdfs/books/STK_NKL_v1.5.pdf

3. PROMOTING MENTAL HEALTH - World Health Organization – PDF format at

   www.who.int/mental_health/evidence/MH_Promotion_Book.pdf

4. LEARNING TO BE: A HOLISTIC AND INTEGRATED APPROACH TO VALUES – UNESCO PDF format at

   www.unesdoc.unesco.org/images/0012/001279/127914e.pdf

5. PERSONALITY DEVELOPMENT By SWAMI VIVEKANANDA
   www.estudantedavedanta.net/Personality-Development.pdf

SEMESTER - II

Version 1 (17.8.17)

U17MAT2103 Advanced Calculus and Numerical Methods (Common to BIO, FT)

L	T	P	J	C
3	1	0	0	4

Course Outcomes

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

CO1	Evaluate double and triple integrals in Cartesian coordinates and apply them to calculate area and volume.	K_3
CO2	Apply the concepts of vector differentiation and various integral theorems for solving engineering problems	K_4
CO3	Transform functions in time domain to frequency domain using Laplace transform and solve ordinary differential equations using Laplace and inverse Laplace transform	K_4
CO4	Solve non –linear equations and system of linear equations numerically	K_4
CO5	Fit a curve, construct the interpolating polynomial for the given data and find the intermediate values.	K_4
CO6	Understand the concepts of Numerical Differentiation and Integration and apply them in Engineering problems.	K_4

Pre-requisites : Nil

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

COs	Programme Outcomes(POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	S	M							M	M				
CO2	S	M							M	M				
CO3	S	M							M	M				
CO4	S	M							M	M				
CO5	S	M							M	M				
CO6	S	S							M	M				
CO7	S	M							M	M				

Course Assessment methods

Direct
1. Continuous Assessment Test I, II 2. Open book test; Cooperative learning report, Assignment; Journal paper review, Group Presentation, Project report, Poster preparation, Prototype or Product Demonstration etc. (as applicable) 3. End Semester Examination
Indirect
1. Course Exit Survey

MULTIPLE INTEGRALS **8 + 2 Hours**

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

VECTOR CALCULUS **10+3 Hours**

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 parallelepipeds.

LAPLACE TRANSFORM **10+3 Hours**

Definition of the Laplace Transform; Properties of the Laplace Transform – Superposition, Shift in t or Time Delay, Shift in s, Time Derivatives, Time Integral-Initial Value Theorem - Final Value Theorem; Transform of periodic functions - Inverse transforms - Convolution theorem – Application to solution of linear ordinary differential equations of second order with constant coefficients - Solution of integral equations.

NUMERICAL SOLUTION OF ALGEBRAIC EQUATIONS **3+3 Hours**

Solution of nonlinear equations: Newton Raphson method for a single equation - Solution of linear system of equations by Gauss - Seidel method.

CURVE FITTING AND INTERPOLATION **6 +2 Hours**

Curve fitting – Method of least squares –Interpolation: Newton's forward and backward difference formulae - Lagrange's method.

NUMERICAL DIFFERENTIATION AND INTEGRATION **8 +2 Hours**

Numerical differentiation by using Newton's forward and backward difference method, Lagrange's method – Numerical integration by Trapezoidal and Simpson's $1/3^{rd}$ and $3/8^{th}$ rules .

Theory: 45	Tutorial: 15	Practical: 0	Project: 0	Total : 60 Hours

REFERENCES

1. Grewal B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 41st Edition.
2. Veerarajan T., Engineering Mathematics (for First Year), Tata McGraw Hill Pub. Co. Ltd., New Delhi, Revised Edition, 2007.
3. Bali N. P and Manish Goyal, "A Text book of Engineering Mathematics", Eighth Edition, Laxmi Publications Pvt Ltd., (2011).
4. Kreyzig E., "Advanced Engineering Mathematics", Eighth Edition, John Wiley and sons, 2010.
5. ArunachalamT., Engineering Mathematics II, Sri Vignesh Publications, Coimbatore. (Revised) 2009,Venkataraman M.K., "Engineering Mathematics", The National Pub. Co., Chennai, 2003.
6. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishingn Company, New Delhi, (2007)

7. Kandasamy P., Thilagavathy K. and Gunavathy K., “Numerical Methods”, S.Chand Co. Ltd., New Delhi, 2007

Online Courses and Video Lectures:

http://nptel.ac.in/course.php?disciplineId=111

www. *mathworld.wolfram.com*

U17PHT2006 **Materials Science for Fashion Technology**

L	T	P	J	C
3	0	0	0	3

Course Outcomes

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

CO1 Acquire the knowledge of conducting materials and its applications.
CO2 Perceive the preambles of semiconductors and categorize its applications.
CO3 Categorize the different types of magnetic and superconducting materials.
CO4 Enumerate the different types of polarization in dielectric materials.
CO5 Confer the properties, preparation and applications of modern engineering materials.
CO6 Identify methods for etching of fabrics.

Pre-requisites :

NIL

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

COs	Programme Outcomes(POs)											
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	S	M										M
CO2	S	M										M
CO3	S	M										M
CO4	S	M										M
CO5	S	M										M
CO6	S	M			M							M

Course Assessment methods

Direct
1. Continuous Assessment Test I, II 2. Cooperative learning report, Assignment; Group Presentation, Project report, Poster preparation 3. End Semester Examination
Indirect
1. Course-end survey

CONDUCTING MATERIALS **9 Hours**

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.

SEMICONDUCTING MATERIALS **9 Hours**

Origin of band gap in solids (Qualitative treatment only) - carrier concentration in an intrinsic semi conductor (derivation) – Fermi level – variation of Fermi level with temperature - Electrical conductivity – band gap semiconductor – Extrinsic semi conductors (Qualitative treatment only) – doping (definition, methods & types) – variation of Fermi level with temperature and impurity concentration – Hall effect – determination of Hall coefficient – experimental set up – applications.

9 Hours

MAGNETIC AND SUPERCONDUCTING MATERIALS

Magnetic materials: Properties of dia, para, ferro, anti ferro and ferri magnetic materials - Domain theory of ferromagnetism - hysteresis – soft and hard magnetic materials – Ferrites – properties - Applications

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.

9 Hours

DIELECTRIC MATERIALS

Electronic, ionic, orientation and space charge polarization - Frequency and temperature dependence of polarization – Dielectric constant, Dielectric loss – Internal field – Classius – Mossotti equation- Dielectric breakdown – different types of break down mechanism - Ferro electric materials - properties and applications.

9 Hours

NEW ENGINEERING MATERIALS AND PLASMA TECHNOLOGY

Metallic glasses: Preparation, properties and applications – Shape memory alloys (SMA) – characteristics, properties of NiTi alloy applications - advantages and disadvantages of SMA.

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.

Theory: 45	**Tutorial: 0**	**Practical: 0**	**Project: 0**	**Total: 45 Hours**

REFERENCES

1. Halliday D., Resnick R. & Walker, J. "Principles of Physics". Wiley, 2015.
2. Calister, "Material Science and Engineering: An Introduction", 7th Edition, John Wiley and Sons, 2006.
3. Gaur R.K. and Gupta S.L., Engineering Physics, 8th edition, DhanpatRai Publications (P) Ltd., New Delhi, 2003.
4. Palanisamy P.K., Materials Science, 2nd edition, Scitech Pub. India, (P) Ltd., Chennai, 2003.
5. Bhattacharya, D.K. & Poonam, T. "Engineering Physics". Oxford University Press, 2015.
6. Rajendran V, Materials science, 5th edition, Tata McGraw Hill Publishing Company Limited, New Delhi, 2003.
7. Avadhanulu M.N. and Kshirsagar P.G., A textbook of Engineering Physics, S.Chand & Company Ltd, New Delhi,2005.
8. Gopal S., Engineering Physics, Inder Publications, Coimbatore, 2006.
9. Goldston R.J. and Rutherford P.H., Introduction of Plasma Physics-I, CRC Pub., New York, America, 2000

U17CHT2009 **Polymer Chemistry**

L	T	P	J	C
3	0	0	0	3

Course Outcomes

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

CO1: Discuss the types of polymer formation (K2)
CO2: Discuss the mechanism of polymer formation (K2)
CO3: Explain the various polymerization techniques (K2)
CO4: Discuss the polymer processing (K2)
CO5: Discuss the fiber processing (K3)
CO6: Outline the principles and instrumentation of spectroscopic techniques involved in material characterization (K2)

Pre-requisites :

NIL

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

COs	Programme Outcomes(POs)											
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO1	M					M						
CO2	S											
CO3	M	M				M						
CO4	M		M			M						
CO5	S											
CO6	M											

Course Assessment methods

Direct

1. Continuous Assessment Test I, II
2. Open book test; Cooperative learning report, Assignment; Journal paper review, Group Presentation, Project report, Poster preparation, Prototype or Product Demonstration etc (as applicable)
3. End Semester Examination

Indirect

1. Course-end survey

POLYMERS 9 Hours

Introduction - Degree of polymerisation - Functionality -Tacticity- Classification based on source, application, thermal properties (thermosetting and thermoplastics) - Glass transition temperature - Effect of polymer structure on properties -Types of polymerisation (Addition, condensation, Co-polymerization, Ring polymerisation) - Mechanism of polymerisation (free radical mechanism, Anionic, Cationic and Coordination mechanism).

POLYMERISATION TECHNIQUES 9 Hours

Homogeneous and Heterogeneous polymerization - Bulk (PVC) - Solution (PAN) - Suspension (PVA) - Emulsion polymerisation (PMMA) - Melt poly condensation (PET) - Solution poly condensation (Polyester resins) - Interfacial poly condensation (Polyamides).

POLYMER PROCESSING 9 Hours

Film casting - Calendering - Thermoforming - Foaming - Moulding Techniques: Compression, Injection, Extrusion and Blow mouldings.
Fibre spinning: Melt, Dry and Wet spinning

FIBRE FORMING POLYMERS 9 Hours

Characteristics of fibre forming polymers - Preparation, Properties, Fibre forming process and Application of Polyethylene, Poly acrylic acid, Nylon 6,6; PET, Nylon 6

SPECTROSCOPIC TECHNIQUES 9 Hours

Introduction to Spectroscopy- Beer Lambert's Law
Principle, Instrumentation (Block diagram only) and Application of Colorimetric analysis (Estimation of concentration of Ferrous and Copper ions in solution), IR Spectroscopy, Flame Photometry, SEM

Theory: 45	Tutorial: 0	Practical: 0	Project: 0	Total: 45 Hours

REFERENCES

1. Gowariker V.R, Viswanathan N.V. and Sreedhar J, Polymer Science, New Age International P (Ltd.,), Chennai, 2016.
2. Seymour R.B. and Carraher C.E. Jr, Polymer chemistry, 6th Edition, Plenum Pub. Corporation, New York, 2003.
3. Alfredo Campo E, Industrial Polymers, Hanser Publishers, USA, 2008.
4. Syed Shabudeen, P.S. and Shoba U.S., Engineering Chemistry, Inder Publishers, Coimbatore. 2014
5. Gupta V.B. and Kothari V.K., Manufactured Fibre Technology, Springer Netherlands, First edition 1997.

U17CSI2211 Structured Programming using C

L	T	P	J	C
3	0	2	0	4

Course Outcomes

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

CO1: Explain the basics of problem solving techniques

CO2: Select appropriate data types and control structures for solving a given problem

CO3: Illustrate the representation of arrays, strings and usage of string operations

CO4: Illustrate the importance of pointers and functions

CO5: Explain the fundamentals of structures and unions

CO6: Explain the fundamentals of file handling

Pre-requisite: Nil

CO/PO Mapping

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	M										
CO2	S	M										
CO3	S	L			L				L	L		
CO4	M	L			L				L	L		M
CO5	M	L			L				L	L		M
CO6	L	L										

Course Assessment methods:

Direct
1. Continuous Assessment Test I, II (Theory Component) 2. Assignment (Theory Component) 3. Group Presentation (Theory Component) 4. Pre/Post - experiment Test/Viva; Experimental Report for each experiment (lab component) 5. Model examination (lab component) 6. End Semester Examination (Theory and lab component)
Indirect
1. Course-end survey

Theory Component contents

FUNDAMENTALS OF PROBLEM SOLVING 9 Hours

Programs and Programming – Classification of Programming Languages based on Generations – Structured Programming Concept – Algorithm – Flowchart – Pseudo code

STRUCTURED PROGRAMMING 9 Hours

Introduction to C Programming – Operators and Expressions – Data Input and Output – Control Statements

ARRAYS AND STRINGS 9 Hours

Defining an array – Processing an array – Passing arrays to functions –Multidimensional Arrays

Defining a string – NULL character – Initialization of Strings – Reading and Writing Strings – Processing Strings – Character Arithmetic – Searching and Sorting of Strings – Library functions for strings

FUNCTIONS, STORAGE CLASSES AND POINTERS 9 Hours

Defining a function – Accessing a function – Function prototypes – Passing arguments to a function – Recursion – Storage classes – Pointer Fundamentals – Pointer Declaration – Passing Pointers to a Function – Pointers and one dimensional arrays – operations on pointers – Dynamic memory allocation

STRUCTURES, UNIONS AND FILES 9 Hours

Structures and Unions: Defining a Structure – Processing a Structure – User defined data types (Typedef) – Unions

Files: Opening and Closing a Data File – Reading and writing a data file – Processing a data file – Unformatted data files – Concept of binary files – Accessing a file randomly using fseek

Theory: 45	Tutorial:0	Practical:0	Total Hours: 45 Hours

REFERENCES

1. Byron S Gottfried and Jitendar Kumar Chhabra, "Programming with C", Tata McGraw Hill Publishing Company, Third Edition, New Delhi, 2011.
2. PradipDey and ManasGhosh, "Programming in C", Second Edition, Oxford University Press, 2011.
3. Kernighan,B.W and Ritchie,D.M, "The C Programming language", Second Edition, Pearson Education, 2006
4. Ashok N. Kamthane, "Computer programming", Pearson Education, 2007.

Lab Component

List of Experiments 30 Hours

1. Writing algorithms, flowcharts and pseudo codes for simple problems.
2. Programs on expressions and conversions
3. Programs using if, if-else, switch and nested if statements
4. Programs using while, do-while, for loops
5. Programs on one dimensional arrays, passing arrays to functions and array operations
6. Programs using two dimensional arrays, passing 2D arrays to functions

7. Programs using String functions
8. Programs using function calls, recursion, call by value
9. Programs on pointer operators, call by reference, pointers with arrays
10. Programs using structures and unions.
11. Programs on file operations and modes.
12. Working with text files, random files and binary files

Theory: 0	Tutorial: 0	Practical: 30	Project: 0	Total: 30 Hours

REFERENCES

1. Byron S Gottfried and Jitendar Kumar Chhabra, "Programming with C", Tata McGraw Hill Publishing Company, Third Edition, New Delhi, 2011.
2. PradipDey and ManasGhosh, "Programming in C", Second Edition, Oxford University Press, 2011.
3. Kernighan,B.W and Ritchie,D.M, "The C Programming language", Second Edition, Pearson Education, 2006
4. Ashok N. Kamthane, "Computer programming", Pearson Education, 2007.

U17FTT2001 Yarn Technology

L	T	P	J	C
3	0	0	0	3

Course Outcomes

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

CO1: Describe the process flow in short staple spinning and also explain the different techniques in yarn manufacturing. K2

CO2: Outline sequentially the processes involved in spinning long staple worsted yarns, and describe the working of various machines used. K2

CO3: Acquire knowledge on post spinning operations and machine used for the process K1

CO4: Compare the quality characteristics of different yarns K4

CO5: Describe the various post spinning processes for spun yarns. K2

CO6: Acquire knowledge on sewing threads and various specialty yarn manufacturing techniques. K2

Pre-requisites :

1. U17FTT1001 Fibre Science
2. U17FTP1501 Fibre Analytical Laboratory

CO/PO Mapping

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

COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	S				M								S	
CO2	S				M								M	
CO3	S												M	
CO4	S													
CO5	S				M								M	
CO6	S												M	

Course Assessment methods

Direct
1. Continuous Assessment Test I, II 2. Open book test; Cooperative learning report, Assignment; Journal paper review, Group Presentation, Project report, Poster preparation, Prototype or Product Demonstration etc (as applicable) 3. End Semester Examination
Indirect
1. Course-end survey

SHORT STAPLE SPINNING SYSTEM (COTTON) 9 Hours

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

LONG STAPLE SPINNING SYSTEM (WORSTED) 9 Hours

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

YARN QUALITY AND CHARACTERISTICS 9 Hours

Acceptable yarn Quality standards of cotton, polyester, polyester / cotton yarns. Yarn faults, imperfections and their identification. Comparison of characteristics of yarns from different spinning systems.

POST SPINNING 9 Hours

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

SEWING THREAD AND SPECIALITY YARNS 9 Hours

Sewing Thread Manufacture**:** Fibres used and their characteristics. Essential quality requirements of sewing threads, Sequence of manufacturing process for sewing threads for cotton, polyester and polyester / cotton blends. Speciality Yarns: Fancy yarns, textured yarns and Melange yarns-Types and classifications. Core spun yarn production technique in ring frame.

Theory: 45	**Tutorial: 0**	**Practical: 0**	**Project: 0**	**Total: 45 Hours**

REFERENCES

1. Klein, W.G, "The Technology of Short Staple Spinning" The Textile Institute, Manhester,1988 (five volumes)
2. Mahendra Gowda, R. V, "New Spinning Systems", NCUTE Publication, Second Edition, 2006
3. Joseph. M. L, "Essentials of Textiles", Hold Rienhart Winston Pub. Co., New York, 1990
4. Oxtoby E, "Spun Yarn Technology", Butterworth and Co., London, 1991.
5. Corbmann, B. P, "Textiles: Fibre to Fabric", McGraw Hill Inc., USA, 1996.
6. Chellamani, K. P, Chattopadhyay. D, "Yarns and Technical Textiles" SITRA publication, First Edition, 1999

U17PHP2501 **Physics Laboratory**
(Common to EC, EE, EI, FT, ME)

L	T	P	J	C
0	0	2	0	1

Course Outcomes

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

CO1: Determine different physical properties of a material like thermal conductivity, thickness of the material.

CO2: Perform experiments involving the physical phenomena like interference and diffraction

CO3: Apply physical theories in real life situations by also taking into account its limitation.

Pre-requisites :

NIL

CO/PO Mapping

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S											
CO2		M	S									
CO3		S		M								

Course Assessment methods

Direct
1. Pre-or Post-experiment Test/Viva; Experimental Report for each experiment; Model Examination 2. End Semester Examination
Indirect
1. Course-end survey

List of Experiments **30 Hours**

1. Determine thermal conductivity of the given cardboard by Lee's disc method.
2. Determine the thickness of a thin sheet by air wedge method.
3. Determine the co-efficient of viscosity of the given liquid by Poiseuille's flow method.
4. Determine the value of acceleration due to gravity by compound pendulum.
5. Calculate the solar panel efficiency by using lux meter.
6. Determine the wavelengths of the violet, blue, green and yellow in mercury spectrum using spectrometer grating method (the green spectral line for which the wavelength is 5461 A^0).
7. Determine Young's modulus of the given bar using non-uniform bending method.
8. Calculate the frequency of the given tuning fork by longitudinal and transverse mode of vibrational methods.
9. Determine the velocity of ultrasonic sound and compressibility of the given liquid by using ultrasonic interferometer.
10. By using semiconductor laser determine:
    i) Wavelength of LASER using grating.
    ii) Acceptance angle & numerical aperture of optical fiber (grating element: N=5,00,000 lines/meter).

Theory: 0 Tutorial: 0 Practical: 30 Project: 0 Total: 30 Hours

REFERENCES

1. Laboratory Manual of Engineering Physics by Dr. Y. Aparna & Dr. K. Venkateswara Rao (V.G.S Publishers)
2. "Practical Physics", G.L. Squires, Cambridge University Press, Cambridge, 1985. 11. 12.
3. "Great Experiments in Physics", M.H. Shamos, Holt, Rinehart and Winston Inc., 1959.
4. "Experiments in Modern Physics", A.C. Melissinos, Academic Press, N.Y., 1966. Gupta S.C, and Kapur, J.N.

U17ISR2001 **Social Immersion Project**

L	T	P	J	C
0	0	0	4	2

(Common to all branches of Engineering and Technology)

Course Outcomes

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

CO1: Achieve the desirable awareness regarding significant social problems and identify the needs to provide a possible and innovative solution.

CO2: Acquire and demonstrate effective professional and technical skills to deal with social issues through innovative leadership and sustainable services / approaches.

CO3: Provide students with a rich practical and socially oriented team work approach.

CO4: Explain how to make leadership decisions concerning organizational structure and the role of project resources on a project's team.

CO5: Enhance technical knowledge in addressing the needs of a community problem

CO6: Identify tools and techniques for planning and working on a project.

Pre-requisites :

CO/PO Mapping

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1			S			S	S					
CO2			M	S		S	M	M	M			
CO3			S	W		S	S		S			M
CO4			S			S	S		W		M	
CO5	S		M			S	M					
CO6			S			S	S					

Course Assessment methods

Direct
1. Project Review 2. General report preparation 3. Team Presentation
Indirect
1. Impact study 2. Field Visit & Observation Skill 3. Course end survey

SOCIAL BONDING AND ENGINEERING

Society and its impact on the individual – Responsibility of individuals towards community building – Essential requirement of the society – Role of an engineering graduate in approaching the requirements - Developing social consciousness.

ENGINEERING PREREQUISITE FOR ENHANCED SOCIAL LIVING

Theoretical reading (Based on the project / general – Books to be identified by the team) - Inculcating Social immersion and Leadership- Study on the society and identifying problems - Social immersion and Engineering implementation - Analysis of problems on issue based - Identification of causes and effects of the social issue identified.

ESSENTIAL ENGINEERING INNOVATION

Essential Engineering Concepts - Multiple approaches towards the problem &Selection for addressing- Addressing a theoretical social problem -Providing multiple solutions for the problem

PROJECT PLANNING AND APPROACHES

Knowledge on budgeting and fund raising - Approaching agencies related to problems. Partnering with agencies- Presentation Skills -Report preparation

BROAD AREA OF PROJECTS

(Students can also identify their own social issue)

Water / Sanitation and Hygiene - Waste Management -Women Empowerment- Community health- Child health/ Poverty/Education/others - Energy management -Environment Management - Adult Education - -Youth Empowerment - Green Industry - Given above are the broad areas of projects recommended. Projects may vary to individuals/ groups/ class/ branch.

Theory: 0	Tutorial: 0	Practical: 0	Project: 0	Total: 60 Hours

REFERENCES

1. Nicholls Alex and Murdock Alex, Social Innovation Blurring Boundaries to reconfigure markets, Palgrave Macmillan., New York, 2012. :
2. Osburg Thomas and Schmidpeter Rene`, Social Innovation Solutions for sustainable Future. Springer, Germany 2013.
3. Adedeji B. Badiru, STEP Project Management: Guide for Science, Technology, and Engineering Projects. Taylor and Francis Group., Florida 2009.

U17VEP2502 **Interpersonal Values**

L	T	P	J	C
0	0	2	0	1

Course Outcomes

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

CO 1: Develop a healthy relationship & harmony with others
CO 2: Practice respecting every human being
CO 3: Practice to eradicate negative temperaments
CO 4: Acquire Respect, Honesty, Empathy, Forgiveness and Equality
CO 5: Practice Exercises and Meditation to lead a healthy life
CO 6: Manage the cognitive abilities of an Individual

Pre-requisites :

1. U17VEP1501 / PERSONAL VALUES

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1										S		
CO2									S			
CO3											M	S
CO4						M						
CO5												M
CO6											M	

Course Assessment methods

Direct
1.Group Activity / Individual performance and assignment 2.Assessment on Value work sheet / Test
Indirect
1. Mini project on values / Goodwill Recognition

30 Hours

Values through Practical activities:

1. Introduction: Introduction to interpersonal values – Developing harmony with others – Healthy relationship – Need & importance of interpersonal values for dealing with others and

team - Effective communication with others.

2. Maneuvering the temperaments: From Greed To Contentment - Anger To Tolerance - Miserliness To Charity – Ego To Equality - Vengeance To Forgiveness.

3. Core value : **Truthfulness -** Honesty –Helping–Friendship – Brotherhood – Tolerance – Caring & Sharing – Forgiveness – Charity –Sympathy — Generosity – Brotherhood - Adaptability.

4.Pathway to Blissful life :

Signs of anger – Root cause – Chain reaction – Evil effects on Body and Mind – Analyzing roots of worries – Techniques to eradicate worries.

5.Therapeutic measures: Spine strengthening exercises - Nero muscular breathing exercises - Laughing therapy - Mindfulness meditation.

Theory: 0	**Tutorial: 0**	**Practical: 30**	**Project: 0**	**Total: 30 Hours**

REFERENCES

1. INTERPERSONAL SKILLS Tutorial (PDF Version) - TutorialsPoint www.tutorialspoint.com/interpersonal_skills/interpersonal_skills_tutorial.pdf
2. INTERPERSONAL RELATIONSHIPS AT WORK - KI Open Archive - Karolinska www. publications.ki.se/xmlui/bitstream/handle/10616/39545/thesis.pdf?sequence=1
3. VALUES EDUCATION FOR PEACE, HUMAN RIGHTS, DEMOCRACY – UNESCO www.unesdoc.unesco.org/images/0011/001143/114357eo.pdf
4. MANEUVERING OF SIX TEMPERAMENTS - Vethathiri Maharishi www.ijhssi.org/papers/v5(5)/F0505034036.pdf
5. THE BLISS OF INNER FIRE: HEART PRACTICE OF THE SIX ... - Wisdom Publications - www.wisdompubs.org/sites/.../Bliss%20of%20Inner%20Fire%20Book%20Preview.pd

ENGLISH ELECTIVES

Version 1 (17.8.17)

U17 ENE2501 **ACADEMIC ENGLISH**

(Common to all branches of Engineering and Technology)

L	T	P	J	C
0	0	4	0	2

Course Outcomes

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

CO1: Maintain the standards of communal communication and acquire excellent listening skills with good Received Pronunciation.

CO2: Accommodate with speaking skills, with fluency in communication obtaining levels of competency.

CO3: Project desirable research oriented skills to interface the corporate and meet out the challenges of the modern trends.

CO4: Familiarising with learner-centred strategies and improve writing activities through proper analysis.

CO5: Develop the ability in procuring information and effectiveness in communication based on situations.

CO6: Ability to present the individuals opinions, persuasion skills and academic curricular along with career profiles.

Pre-requisites :

CO/PO Mapping

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				**M**		**S**	**M**		**M**	**S**	**S**	**M**
CO2				**M**		**S**	**M**		**M**	**S**	**S**	**M**
CO3				**M**		**S**	**M**		**M**	**S**	**S**	**M**
CO4				**M**		**S**	**M**		**M**	**S**	**M**	**M**
CO5				**M**		**S**	**M**		**M**	**S**	**M**	**M**
CO6				**M**		**S**	**M**		**M**	**S**	**M**	**M**

Course Assessment methods

Direct

1. Continuous Assessment
2. Cooperative learning
3. Assignment
4. Presentation
5. End Semester Examination

Indirect
1. Course-end survey

AUDITORY PERCEPTION **12 Hours**

Listening for understanding & information - short announcements, short conversations, telephonic conversation; Listening to British, American, Australian and Neutral Accent of Indian English; Listening and synthesizing information; Listening to TED/INK Talks (General); Critical review of short films, documentaries.

ORAL FLUENCY **12 Hours**

Informal introduction of self and others, conversation starters, articulating simple thoughts and ideas with clarity, Seeking Permission, Talking about People and Places. Describe an object or event. Retelling an incident, voicing opinions, persuasion skills, speaking from a single perspective (debate) - preparing and delivering an informal talk, Introduction to Presentation Skills – Formal tone – Impersonal style - Structuring and Presenting information. Transcode graphics orally.

FOUNDATIONS OF ACADEMIC WRITING **12 Hours**

Plan and write a library-based coursework assignment on an Engineering topic. Read academic textbooks and journal articles. Research and analyse scientific data and express understanding. Procuring information - Identifying research papers in a specific discipline, reading abstracts of research papers, reading the abstract of projects, reading articles from journals and publications and documenting/ archiving information.

TRAITS OF RESEARCH WRITING **12 Hours**

Reading research articles and summarizing. Review of Secondary sources - Writing an abstract - Writing an introduction to a paper in academic writing - Avoiding plagiarism – Bibliography – International Academic Styles of writing a research paper - Peer Evaluation.

PROCESS OF PREPARING A RESEARCH ARTICLE **12 Hours**

Research Projects – Converging areas of interest into field of research - Identifying the problem of research – Formulating hypothesis – Research Objectives – Literature Review – Identifying the research gap - Research methodology – Requirements – Plan of work – Result and Discussion – Conclusion – References – Appendices.

Theory: 0	**Tutorial: 0**	**Practical:60**	**Project: 0**	**Total: 60 Hours**

REFERENCES

1. English and Communication Skills—S.P.Dhanavel—Orient Blackswan Pvt Lted, Hyderabad.
2. Effective Technical Communication—Ashraf Rizvi—Tata McGraw Hill, New Delhi.
3. A Course in Communication Skils—Kiranmai Dutt, Geetha Rajeevan, C.L.N.Prakash—Foundation Books, New Delhi.

U17ENE2502 PROFESSIONAL ENGLISH

(Common to all branches of Engineering and Technology)

L	T	P	J	C
0	0	4	0	2

Course Outcomes

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

CO1: Formulate an understanding for effective use of short telephonic and oral conversations.

CO2: Analyse and identify necessary interpersonal and persuasive skills for effective oral presentation.

CO3: Employ appropriate strategies to articulate random thoughts and ideas in brainstorming sessions.

CO4: Analyse and review technical and non-technical contents.

CO5: Compose and compile effective written documents needed in a professional scenario.

CO6: Recognize and establish dynamic corporate communication and relationship.

Pre-requisites :

CO/PO Mapping

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1										**M**		
CO2										**S**		**M**
CO3										**S**		**M**
CO4	**M**	**S**	**M**	**S**						**S**		**M**
CO5				**M**						**S**		
CO6						**M**	**M**	**S**	**S**			**S**

Course Assessment methods

Direct
1. Continuous Assessment 2. Review 3. Assignment 4. Report 5. End Semester Examination
Indirect
1. Course-end survey

AUDITORY PERCEPTION **12 Hours**

Listening for understanding & information - short announcements, short conversations, telephonic conversation; Listening to British, American, Australian and Neutral Accent of Indian English; Listening and synthesizing information; Listening to TED/INK Talks (General); Critical review of short films, documentaries

ORAL FLUENCY **12 Hours**

Informal introduction of self and others, conversation starters, articulating simple thoughts and ideas with clarity, Seeking Permission, Talking about People and Places, Describe an object or event. Retelling an incident, voicing opinions, persuasion skills, speaking from a single perspective (debate) - preparing and delivering an informal talk, Introduction to Presentation Skills – Formal tone – Impersonal style - Structuring and Presenting information. Transcode graphics orally

FOUNDATIONS OF PROFESSIONAL COMMUNICATION **12 Hours**

Focused listening, Listening to lectures and talks on science and technology, Listening in international seminars, Video Documentary review, Receiving compliments and sharing information in a corporate scenario, Speaking in Formal Context. Business Vocabulary. Speaking practice in a variety of registers, Giving and Getting Product and Service Information. Product Review. Recording equipment and safety checklist. Business Itinerary, Presenting a Company Profile, Encoding and decoding advertisements

CORPORATE DYNAMICS **12 Hours**

Corporate Social Responsibility, Crisis Management - handling issues and situations, Creating a powerful first impression, Goal Setting - Immediate goals, short term goals, long term goals, smart goals, strategies to achieve goals, Time Management - Types of time, Identifying time wasters, time management skills, Stress Management - Reasons, Strategies to cope up with stress, Stress-busters, Emotional Intelligence – Mental health, Job performance, Managing emotions.

PROFESSIONAL WRITING **12 Hours**

Writing Agenda and minutes of the meetings, Writing daily/periodic reports, Writing business / professional letters, Business E-mail - Writing an Email Announcing a Meeting -Writing an Email Announcing the modifications in a Meeting - Writing an Email Announcing the cancellation/ postponement of Meeting

Theory: 0	Tutorial: 0	Practical:60	Project: 0	Total: 60 Hours

REFERENCES

1. Soft Skills for Young Managers—Prof.M.S.Rao—Biztantra Publications, New Delhi.
2. Soft Skills—Dr.K.Alex—S.Chand and Co, New Delhi.
3.Professional Communication—Aruna Koneru—Oxford University Press, New Delhi.

U17ENE2503 ENGLISH FOR COMPETENCY

(Common to all branches of Engineering and Technology)

L	T	P	J	C
0	0	4	0	2

Course Outcomes

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

CO1*:* Recognize the inventory of listening strategies by various proposed listening activities.

CO2: Construct learning situations and increase speaking skills based on strong educational and communication theories.

CO3: Invent and practice effective reading strategy to enhance competent communication

CO4: Honing the strengths of writing skills and set objectives for future development

CO5: Showcase industry-ready attitude along with corporate communication

CO6: Develop imaginative and critical thinking abilities, and improve the problem solving aptitude.

Pre-requisites :

CO/PO Mapping

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1				**M**		**S**	**M**		**M**	**S**	**S**	**M**
CO2				**M**		**S**	**M**		**M**	**S**	**S**	**M**
CO3				**M**		**S**	**M**		**M**	**S**	**S**	**M**
CO4				**M**		**S**	**M**		**M**	**S**	**M**	**M**
CO5				**M**		**S**	**M**		**M**	**S**	**M**	**M**
CO6				**M**		**S**	**M**		**M**	**S**	**M**	**M**

Course Assessment methods

Direct
1. Continuous Assessment 2. Review 3. Assignment 4. Report 5. End Semester Examination
Indirect
1. Course-end survey

AUDITORY PERCEPTION **12 Hours**

Listening for understanding & information - short announcements, short conversations,

telephonic conversation; Listening to British, American, Australian and Neutral Accent of Indian English; Listening and synthesizing information; Listening to TED/INK Talks (General); Critical review of short films, documentaries.

ORAL FLUENCY **12 Hours**

Informal introduction of self and others, conversation starters, articulating simple thoughts and ideas with clarity, Seeking Permission, Talking about People and Places. Describe an object or event. Retelling an incident, voicing opinions, persuasion skills, speaking from a single perspective (debate) - preparing and delivering an informal talk, Introduction to Presentation Skills – Formal tone – Impersonal style - Structuring and Presenting information. Transcode graphics orally.

FOUNDATIONS OF ETS **12 Hours**

Analogy, Synonyms and antonyms, Morphemes –Derivational and Inflectional, Affixes – Prefix and Suffix, strategies to improve high frequency vocabulary

VERBAL BASED COMPETENCY **12 Hours**

Verbal Reasoning - Critical Reasoning & Verbal Deduction - Statement and Assumptions, Statement and Arguments, Statement and Inference, Strong and Weak Arguments, Sentence Correction,; Sentence Equivalence, Text Completion, Word Groups, Integrated Reasoning – Graphics Interpretation, Two-part Analysis, Table Analysis, Multi-source Reasoning

SKILL BASED COMPETENCY **12 Hours**

Analytical writing – Argumentative writing, a 30-minute Analyse an argument, a 30-minute Analyse an issue, Listening and Speaking Tasks in ETS, Reading Comprehension – GRE, GMAT, TOEFL, IELTS, GATE

Theory: 0	**Tutorial: 0**	**Practical:60**	**Project: 0**	**Total: 60 Hours**

REFERENCES

1. Personality Development and Soft Skill—Barun.K.Mitra—Oxford University Press, New Delhi.
2. A Modern Approach to Verbal and Non-verbal Reasoning—R.S.Agarwal—S.Chand & Co., New Delhi.
3. Soft Skills—Dr.K.Alex—S.Chand & Co., New Delhi

SEMESTER - III

Version 1 (17.8.17)

U17EEI3206 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

L	T	P	J	C
3	0	2	0	4

COURSE OUTCOMES

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

CO1	Acquire basic knowledge on DC and AC circuits.	**K_2**
CO2	Understandthe construction, working principle and applications of DC machines	**K_2**
CO3	Understandthe construction, working principle and applications of AC machines and transformers.	**K_2**
CO4	Acquire basic knowledge on logic gates, semiconductor devices and their applications.	**K_2**
CO5	Identify electronic components and use them to design simple circuits.	**K_2**

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

COs	Programme Outcomes(POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	M	M										W		
CO2	M	M										W		
CO3	M	M										W		
CO4	M	M										W		
CO5	M	M										W		

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	1.Course Exit Survey

DC circuits: **9hours**

Basic circuit elements and sources, Ohms law, Kirchhoff's laws, series and parallel connection of circuit elements, Node voltage analysis, Mesh current analysis.

AC circuits: **9hours**

Alternating voltages and currents –SinglePhase Series RL, RC, RLC

Circuits, Power in AC circuits –PowerFactor.

Electrical Machines:9hours
Construction, Working Principle andapplications of DC generators, DC Motors, single phase Transformers, three phase and single phase induction motors.

Semiconductor devices and Circuits: 9hours
PN junction diode – Zener Diode – Half wave and Full wave rectifier-voltage regulators – Bipolar Junction transistors, JFET, MOSFET – characteristics

Digital Systems: 9 hours
Binary Number System – Logic Gates – Boolean algebra – Half and Full Adders -sbutractor– Multiplexer – Demultiplexer-decoder-flip flops.

Laboratory experiments

1. Measurementofelectricalquantities–voltage,current,power&power factor in RL, RC and RLC circuits.
2. Verification of Kirchoff's Voltage and Current Laws.
3. Verification of Mesh and Nodal analysis.
4. Load test on DC shunt motor.
5. Load test on single phase transformer.
6. Load test on single phase induction motor.
7. Verification of truth tables of OR, AND, NOT, NAND, NOR, EX-OR, EXNOR gates.
8. Full wave rectifier with and without filter.
9. Input and output Characteristics of BJT – CE configuration.
10. Characteristics of PN junction diode and Zener diode.

Theory: 45 Tutorial: 0 Practical: 30 Hours Project: 0 Total: 75Hours

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

REFERENCES
1. Muthusubramanian R, Salivahanan S and Muraleedharan K A, "Basic Electrical, Electronics and Computer Engineering", Tata McGraw Hill, Second Edition, 2017.
2. Nagsarkar T K and Sukhija M S, "Basics of Electrical Engineering", Oxford press 2005.
3. Mehta V K, "Principles of Electronics", Third Edition,S.Chand& Company Ltd, 1994.
4. MahmoodNahvi and Joseph A. Edminister, "Electric Circuits", Schaum' Outline Series, McGraw Hill, 2002.
5. Premkumar N, "Basic Electrical Engineering", Anuradha Publishers, 2003.

", Oxford press, 2005.

U17FTT3001 WEAVING TECHNOLOGY

L	T	P	J	C
3	0	0	0	3

COURSE OUTCOMES

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

CO1	Acquaint with the objectives and acquire knowledge of working principles of machinery used for preparation of yarn for weaving	K2
CO2	Describe the working principle of beam preparatory machines for weaving.	K2
CO3	Acquire knowledge in the selection of sizing ingredients for different fibres.	K4
CO4	Understand the objectives and working principles of shuttle and shuttleless looms	K2
CO5	Develop knowledge in the selection of suitable preparatory processes for weaving	K4
CO6	Acquire knowledge on parameters for quality control in the preparatory processes and weaving.	K2

Pre Requisite:

1. U17FTT1001 Fibre Science
2. U17FTT2001 Yarn Technology
3. U17FTP1501 Fibre Analytical Laboratory

CO/PO Mapping

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

COs	Programme Outcomes(POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	S	S												
CO2	S	S												
CO3		S											M	W
CO4		S											W	M
CO5		S	S		S								M	M

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	2. Course Exit Survey

YARN PREPARATION FOR WEAVING **9 Hours**

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

BEAM PREPARATION FOR WEAVING **9 Hours**

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 **9 Hours**

Objectivesandworkingprinciples– 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 **9 Hours**

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

PROCESS CONTROL IN WEAVING **9 Hours**

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

TOTAL: 45 Hours

REFERENCES

1. AllanOrmerod,WalterS.Sondhelm,Weaving-TechnologyandOperations, TextileInstituteP ub., 1995.
2. LordP.R.andMohammed,Weaving:Conversionofyarntofabric, M.H. MerrowPub.CoLtd.,U.K.,1998.
3. Talukdar,Introductiontowindingandwarping,MahajanPub. (P)Ltd., 1998.
4. Talukdar, Wadekar and Ajgaonkar, Sizing–Materials, methods and machines, 2nd edition,Mahajan P ub. (P)Ltd.,1998.
5. Gokarneshan N., Weaving Preparation Technology, Abhishek Pub., 2009
6. Talukdar, SriramuluandAjgaonkar, Weaving–Machines, Mechanisms,Management, MahajanPub. (P) Ltd.,1998

U17FTI3202 CONCEPTS OF FASHION AND DESIGN

L	T	P	J	C
3	0	2	0	4

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

CO1	Adapt elements & principles of design in context to Textiles and Apparels.	K6
CO2	Choose suitable color dimensions and categories for textiles and apparels.	K3
CO3	Summarize the dynamics of fashion and the role of fashion designers and fashion forecasting process.	K2
CO4	Explain the significance of a fashion portfolio and Identify the traditional world costumes and textiles of India.	K3
CO5	Design patterns and garments using various drawing techniques and drawing media. Illustrate various garment components, accessories & human anatomy.	K3
CO6	Develop theme boards based on a theme. Create patterns and garment designs deriving inspirations from a theme.	K3

Pre Requisite: Nil

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

COs	Programme Outcomes(POs)													
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1		S	S										S	S
CO2		S	S	M									S	S
CO3		S						M				M	M	
CO4		S	S	M									M	
CO5			M							M				
CO6		S												

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	3.Course Exit Survey

Course Content

DESIGN CONCEPTS **7 Hours**

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 **7 Hours**

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 **11 Hours**

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 **9 Hours**

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, 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 Tutorial: 0	**Practical: 0**	**Project: 0**	**Total: 45Hours**

REFERENCES

1. Kathryn McKelvey and Janine Munslow, “Fashion Design: Process, Innovation and Practice”, Blackwell Publishing, USA, 2005.
2. Diane.T and Cassidy. T, “Colour forecasting” Blackwell Publishing, 2005
3. Dar, S.N., “Costumes of India and Pakistan”, D.B Tataporevala Sons and Co. Ltd., 1982.
4. Churye G.S, “Indian Costume”, Popular PrakashanPvt. Ltd., Bombay, 1995.
5. HatanakaKokyo Collection –“Textile arts of India”, Chronide Books, 1996
6. Elaine Stone, Jean A. Samples, “ Fashion Merchandising” McGraw-Hill Book Company 1985.
7. RusselGillow 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.

LAB COMPONENT CONTENTS

LIST OF EXPERIMENTS

1. Motif Development – Design Repeat and positioning.
2. Object Drawing and Shading concepts.Drape of fabrics and shading with different mediums
3. Preparing swatches for dimensions of colour, different colour theories and harmonies
4. Rendering prints and textures with various fabric constructions (wovens, non-wovens and knit)

5. Drawing different Silhouettes and garment components - sleeves, collars, necklines, cuffs, skirts, pants
6. 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.
7. Normal Drawing - Eight head theory. Fashion Figure Drawing - Drawing croqui figures- stick, geometric, flesh - 8 ½ and 10 head figures.

8. Different postures of male and female figure - ¾ view, back view, side view. Different poses like – S-Pose, X-Pose, and T-pose.
9. Drawing croqui figures using template, model, imagination and photograph.
10. Create a mood board based on a selected theme, Develop garments on croqui figures (Male and female) deriving inspirations from the developed mood board.

Theory: 0 Tutorial: 0	**Practical: 30**	**Project: 0**	**Total: 30Hours**

U17FTT3003 PATTERN MAKING AND ADAPTATION

L	T	P	J	C
3	0	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	K2
CO2	Prepare the basic block patterns for men, women and kids wear based on the principles and methodologies of drafting	K3
CO3	Prepare patterns for basic blocks using draping techniques	K3
CO4	Apply dart manipulation techniques to design, variation in garment components	K6
CO5	Evaluate the techniques involved in pattern alteration for various body measurements and fitting problems	K5
CO6	Develop knowledge on the techniques involved in grading for various sizes of body measurements	K3

Pre Requisite : Nil

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

COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		S											M	
CO2	S	S	M							M			S	M
CO3	S	S	M							M			S	M
CO4		S	S										S	
CO5	S	S	M	M								M	M	
CO6	S	S	M										M	

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	1. Course Exit Survey

Course Content

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

DRAFTING **9 Hours**

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 **9 Hours**

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

FLATPATTERNTECHNIQUES **9 Hours**

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.

PATTERNALTERATION **5 Hours**

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 **4 Hours**

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

Theory: 45 Hours **Total: 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; KundelCarlyn, “Pattern making by the flat pattern method”, 1998
5. Gillian Holman,“PatternCuttingMadeEasy”, 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.

U17FTI3204 GARMENT COMPONENTS FABRICATION

L	T	P	J	C
3	0	2	0	4

COURSE OUTCOMES

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

CO1	Define and Classify the types of stitches, seams, seam finishes, stitch and seam defects.	K2
CO2	Discuss the various methods for creating fullness in garments	K6
CO3	Develop simple patterns for different garment components	K3
CO4	Construct different types of garment components suiting requirements of the wearer	K3
CO5	Construct the different types of garment fasteners suiting requirements of the wearer	K3
CO6	Select and analyze garment components, seam /stitch types for different garment styles and purposes	K5

Pre Requisite: Nil

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

COs	Programme Outcomes(POs)													
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	S									M			M	
CO 2	S	S	S										M	
CO 3	S	S	M	S									S	M
CO 4		S	S			M							S	M
CO 5			S	S		M							S	M
CO 6		S	M	M		M						M	S	

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam 5. Model exams, Lab exercises & End semester exams for lab component	1. Course Exit Survey

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.

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 pocket- bound pocket, welt pocket, pocket in a seam- front hip pocket, Attaching flap to a patch pocket.

9 Hours

PLACKETS: Inconspicuous plackets - continuous bound placket, two-piece 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 Tutorial: 0 Practical: 0 Project: 0 Total: 45 Hours

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
3. 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.

LAB COMPONENTS

LIST OF EXPERIMENTS

1. Preparing samples for basic Hand stitches.
2. Preparing samples for seams
3. Preparing samples for seam finish.
4. Preparing samples for Darts, pleats and tucks
5. Preparing samples for gathers, godets and frills
6. Preparing samples for Necklines – Bias facing, Bias Binding and Fitted facing.
7. Preparing samples for Sleeves – Plain, Puff, Raglan, Kimono, Cap Sleeve
8. Preparing samples for collars – Peter Pan collar, Full shirt collar, Shawl collar.
9. Preparing samples for pockets – Patch Pocket, Bound Pocket and Front Hip Pocket.
10. Preparing samples for plackets – continuous bound placket, 2 piece placket, tailors placket, Fly opening and Zipper

Theory: 0 Tutorial: 0 Practical: 30 Project: 0 Total: 30 Hours

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
3. 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

U17INI3600 ENGINEERING CLINIC – I

L	T	P	J	C
0	0	4	2	3

Course objectives

- To help the students look into the functioning of simple to complex devices and systems
- To enable the students to design and build simple systems on their own
- To help experiment with innovative ideas in design and team work
- To create an engaging and challenging environment in the engineering lab

Course Outcomes

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

CO1: Identify a practical problems and find a solution
CO2: Understand the project management techniques
CO3: Demonstrate their technical report writing and presentation skills

Pre-requisite:

1. Nil

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

COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	S	S	S	S	S	M	W		S			S		
CO2											S			
CO3										S				

Course Assessment methods:

Direct	Indirect
1. Project reviews 50%	1. Course Exit Survey
2. Workbook report 10%	
3. Demonstration& Viva-voce 40%	

Content:

The course will offer the students with an opportunity to gain a basic understanding of computer controlled electronic devices and apply the concepts to design and build simple to complex devices. As a practical project based embedded course, the students will be taught the concepts using a variety of reference material available in the public domain. While the course

will start with formal instruction on hardware, programming and applications, the major portion of the course will provide the students with ample opportunity to be innovative in designing and building a range of products from toys to robots and flying machines.

In the III semester, students will focus primarily on IOT with C programming using Audino.

GUIDELINES:

1. Practical based learning carrying credits.
2. Multi-disciplinary/ Multi-focus group of 5-6 students.
3. Groups can select to work on a specific tasks, or projects related to real world problems.
4. Each group has a faculty coordinator/Instructor who will guide/evaluate the overall group as well as individual students.
5. The students have to display their model in the 'Engineering Clinics Expo' at the end of semester.
6. The progress of the course is evaluated based on reviews and final demonstration of prototype.

Total Hours: 90

U17VEP3503 **FAMILY VALUES**
(Mandatory)

L	T	P	J	C
0	0	2	0	0

Course Outcomes

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

CO 1: Develop skills in maintaining the harmony in the family.
CO 2: Create impulsive activities for healthy family
CO 3: Be receptive to troubled Individuals
CO 4: Gain healthy life by practicing Kundalini Yoga &Kayakalpa
CO 5: Possess Empathy among family members.
CO 6: Reason the life and its significance

Pre-requisites :

1. U17VEP1501 / PERSONAL VALUES

2. U17VEP2502 / INTERPERSONAL VALUES

CO/PO Mapping

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1									S			
CO2							M					
CO3										M		
CO4												S
CO5						S						
CO6								M				

Course Assessment methods

Direct
1.Group Activity / Individual performance and assignment 2.Assessment on Value work sheet / Test
Indirect
1. Mini project on values / Goodwill Recognition

Values through Practical activities:

1. Family system: Introduction to Family Values – elements of family values - Adjustment, Tolerance, Sacrifice - Family structure in different society – work life balance.
2. Peace in Family : Family members and their responsibility - Roles of parents, children, grant parents -. Respectable women hood
3. Core value:Empathy: Unconditional love - Respect - Compassion - sacrifice–Care &share - helping – emotional support- hospitality – cleanliness
4. Blessing: Blessing - methods - Vibration effect - Benefits - Reason for misunderstanding in the Family and resolution through blessings.
5. Healthy Family: Good relationship with neighbors - Counseling - Simplified Kundalini Yoga - Kaya Kalpa Yoga

Workshop mode

REFERENCES

1. FAMILY - www.download.nos.org/331courseE/L-13%20FAMILY.pdf
2. FRAMEWORK FOR ACTION ON VALUES EDUCATION IN EARLY CHILDHOOD – UNESCO – PDF –www.unesdoc.unesco.org/images/0012/001287/128712e.pdf
3. TRUE FAMILY VALUES Third Edition - Tparents Home www.tparents.org/Library/Unification/Books/TFV3/_TFV3.pdf
4. FAMILY VALUES IN A HISTORICAL PERSPECTIVE - The Tanner Lectures on www.tannerlectures.utah.edu/_documents/a-to-z/s/Stone95.pdf
5. PROBLEMS OF INDIA'S CHANGING FAMILY AND STATE ... - the United Nations - www.un.org/esa/socdev/family/docs/egm09/Singh.pdf

U17CHT3000 **ENVIRONMENTAL SCIENCE AND ENGINEERING**
(Common to All branches)

L	T	P	J	C
3	0	0	0	0

Course Outcomes (COs)

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

CO 1: Analyze the impact of engineering solutions in a global and societal context.

CO 2: Discuss contemporary issues that results in environmental degradation and would attempt to provide solutions to overcome those problems.

CO 3: Highlight the importance of ecosystem and biodiversity.

CO 4: Consider issues of environment and sustainable development in his/her personal and professional undertakings.

CO 5: Paraphrase the importance of conservation of resources.

CO 6: Play an important role in transferring a healthy environment for future generations.

CO-POs & PSOs Mapping
(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak

COs	Programme Outcomes (POs) & Programme Specific Outcomes (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		M					S		M					
CO2						M				M				
CO3							M							
CO4						M	S							L
CO5							S							
CO6			L				S					M		

Course Assessment methods

Direct	Indirect
1. Internal Test I 2. Internal Test II 3. Assignment 4. Group presentation	Course end survey

INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES **14 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, conflicts over water, dams – benefits and problems – Water conservation, rain water harvesting, watershed management.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, case studies.Energy resources: Growing energy needs, renewable and nonrenewable energy sources, use of alternate energy sources, case studies.Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification, Wasteland reclamation – Role of an individual in conservation of natural resources.

ECOSYSTEMS AND BIODIVERSITY ECOSYSTEM: **9 Hours**

Concept of an ecosystem – Structure and function of an ecosystem: Producers, consumers and decomposers, Food chain, Food web, Energy flow in the ecosystem 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 – Bio geographical classification of India – Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic values – 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.

ENVIRONMENTAL POLLUTION **8 Hours**

Definition – Causes, effects and control measures of: (a) Air pollution – Organic and inorganic pollution – cyclone separator, electrostatic precipitator (b) Water pollution (c) Heavy metal pollution (d) Noise pollution (e) Thermal pollution (f) Nuclear hazards – Role of an individual in prevention of pollution – Pollution case studies – Solid waste and hazardous Management: Causes, effects and control measures from factories, small scale and large scale industries – Waste minimization – Disaster management: floods, earthquake, cyclone and landslides.

SOCIAL ISSUES AND THE ENVIRONMENT **7 Hours**

From Unsustainable to Sustainable development – Urban problems related to energy – Resettlement and rehabilitation of people; its problems and concerns, case studies – Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion – Environment Production 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 – Human Rights.

HUMAN POPULATION AND THE ENVIRONMENT **7 Hours**

Population growth and explosion – Welfare Program – Environment and human health – Communicable disease – Role of Information Technology in Environment and human health – Case studies.

Theory: 45 Hours	**Total: 45 Hours**

REFERENCES

1. G. Tyler Miller and Scott Spoolman, 'Environmental Science', Fourteenth Edition, Brooks Cole, 2012.
2. Gilbert M. Masters and Wendell P. Ela, 'Introduction to Environmental Engineering and Science', Third Edition, Pearson Education, 2013.
3. BharuchaErach, 'The Biodiversity of India', Mapin Publishing Pvt. Ltd., Ahmedabad, 2002.
4. Trivedi R.K and P.K.Goel, 'Introduction to Air Pollution', Techno-Science Publications, 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 and T.H.Gorhani, 'Environmental Encyclopedia', Jaico Publication House, Mumbai, 2001.
7. Wager K.D., 'Environmental Management', W.B. Saunders Co., Philadelphia, USA, 1998.
8. Colin R. Townsend, Michael Begon and John L. Harper, 'Essentials of Ecology', Third Edition, Blackwell Publishing, 2008.

SEMESTER - IV

Version 1 (17.8.17)

U17MAT4102 PROBABILITY AND STATISTICS

L	T	P	PJ	C
3	1	0	0	4

(FT)

Course Outcomes

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

CO1:Compute measures of central tendencies, dispersion and correlation between variables, and predict unknown values using regression.

CO2: Understand and apply the concept of probability and random variables.

CO3: Construct probabilistic models for observed phenomena through distributions, which play an important role in many engineering applications.

CO4 :Perform hypothesis testing and interpret the results.

CO5: Understand the principles of design of experiments and perform analysis of variance.

CO6: Sketch control charts and comment on the process control.

Pre-requisites : Nil

CO/PO Mapping

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	S							M	M		M
CO2	S	S							M	M		M
CO3	S	S							M	M		M
CO4	S	S							M	M		M
CO5	S	S							M	M		M
CO6	S	S							M	M		M

Course Assessment methods

Direct
1. Continuous Assessment Test I, II 2. Open book test; Cooperative learning report, Assignment; Journal paper review,

Group Presentation, Project report, Poster preparation, Prototype or Product Demonstration etc. (as applicable) 3. End Semester Examination
Indirect
1. Course-end survey

STATISTICAL MEASURES **9 +3 Hours**

Measures of central tendency: Arithmetic Mean, Median and Mode – Measures of variation: Range, Mean deviation, Standard deviation and Coefficient of variation – Correlation (Discrete Data) – Karl Pearson's Correlation coefficient – Spearman's Rank Correlation – Regression lines (Discrete Data).

PROBABILITY AND RANDOM VARIABLES **9+3 Hours**

Axioms of probability - Conditional probability – Total probability – Bayes' theorem - Random variable – Distribution function – properties – Probability mass function – Probability density function – moments - Moment Generating functions.

STANDARD DISTRIBUTIONS **9+3 Hours**

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

TESTING OF HYPOTHESIS **9+3 Hours**

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 **5 +2 Hours**

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

STATISTICAL QUALITY CONTROL **4 +1 Hours**

Concept of process control - Control charts for variables – Mean and Rangecharts – Control charts for attributes – p, np, c – charts.

Theory: 45 Tutorial: 15 Practical: 0 Project: 0 Total: 60 Hours

REFERENCES

1. Veerarajan T., Probability, Statistics and Random Processes, Tata McGraw Hill, 3rd edition, 2008.
2. Gupta S. P, Statistical Methods, Sultan Chand & Sons Publishers, 2014.
3. Johnson R. A., Miller & Freund's "Probability and Statistics for Engineers", Sixth Edition, Pearson Education, Delhi, 2000.
4. Gupta.S.C and Kapoor V.K, Fundamentals of Mathematical Statistics, 11th extensively revised edition, Sultan Chand & Sons, 2007.
5. Walpole R. E., Myers S.L. & Keying Ye, "Probability and Statistics for Engineers and Scientists", Pearson Education Inc, 9th edition, 2012.
6. Gupta S.C, and Kapur V.K, Fundamentals of Applied Statistics, Sultan Chand, New Delhi, 4th Edition, 2014.
7. Charles Henry Brase and CorrinnePellilloBrase "Understandable Statistics", D.C. Heath and Company, Toronto, 9th edition, 2007.

L	T	P	J	C
3	0	0	0	3

U17MET4007BASICS OF MECHANICAL ENGINEERING

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 Explain the working principle and combustion characteristics of IC Engines.

CO3 Explain the working principle of VCR & VAR systems.

CO4 Understand and explain the various manufacturing processes and power transmission

CO5 Demonstrate basic manufacturing process

CO6 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	Programme Outcomes(POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	S													
CO2		M												
CO3		M												
CO4	W													
CO5	M													
CO6	M													

Course Assessment Methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	1. Course Exit Survey

Course Content

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.

POWER PLANTS **9 Hours**

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 **9 Hours**

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 **9 Hours**

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

POWER TRANSMISSION **9 Hours**

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 **Total: 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.
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 James Brown, “Advanced Machining Technology Handbook”, McGraw Hill, New York,1998

L	T	P	J	C
3	0	0	0	3

U17FTT4001 APPAREL MACHINERYAND EQUIPMENT

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 Evaluate the marker efficiency.	K5
CO2	Describe the basic principles of working of different types of cutting machineries used in apparel production	K2
CO3	Test the settings and adjustment parts of sewing machines	K4
CO4	Develop skills for recognize various parts and their working principles in advanced garment sewing machines.	K3
CO5	Acquire knowledge on special machineries used in apparel production	K3
CO6	Express the importance and the audit of sewing machinery maintenance.	K2

Pre Requisite: NIL

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak														
COs	Programme Outcomes(POs)													
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO1 1	PO1 2	PSO 1	PSO 2
CO1	S	M	M					W				M	S	M
CO2								W				M	S	M
CO3	S	S	S					W				M	S	M
CO4								W				M	S	M
CO5								W				M	S	M
CO6								W				M	S	M

Course Assessment methods:

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	1. Course Exit Survey

Course Content

SPREADINGMACHINES **8 Hours**

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.

CUTTINGMACHINES **8 Hours**

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

SEWINGMACHINE- SNLS **10 Hours**

Basic parts of sewing machine – primary and auxiliary parts and their functions. Bobbincase/Bobbinhook, Throat plate – Takeup 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**

REFERENCES

1. HaroldCarrandBarbaraLatham,“TheTechnologyofClothingManufacture”,OmBookService,2002.
2. ShaefferClaire,“SewingfortheApparelIndustry”,PrenticeHall,NewJersey, 2001.
3. Singer,“SewingLingerie”,CyDeCosseIncorporated,1991.
4. Laing R.M. and Webster J, “Stitches and Seams”, The Textile Institute,Manchester, 1999
5. Technical Advisory Committee of AAMA, “ ANewLookatApparel Mechanization”,1978.
6. JacobSolinger,“ApparelProductionHandbook”,ReinholdPublications,1998

U17FTI4202 APPAREL DESIGN AND DEVELOPMENT

L	T	P	J	C
3	0	2	0	4

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.	K2
CO2	Developing designing skills in preparation of garments by implementing the various measurements for children's, women's and men's garments.	K3
CO3	Developing skills in pattern development and construction methods for children's, women's and men's garments.	K6
CO4	Trace the knowledge on the different varieties of woven and knitted garments.	K3
CO5	Assess the suitability of garment patterns, fabrics, seams to fit the individuals	K5
CO6	Assess the comfort ability parameters on woven and knitted garments	K3

Pre Requisite :
U17FTI3202 Concepts of Fashion & Design (Embeded)
U17FTT3003 Pattern making and Adaptation
U17FTT3004 Garment components fabrication (Embeded)

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

Cos	Programme Outcomes(Pos)													
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO -1	PSO-2
CO 1	S	M											M	
CO 2	S	S	M						M				M	M
CO 3		S	S	S					M				S	M
CO 4	M	S	S	S									M	
CO 5	M		M	S					S	W	M	M	S	M
CO 6			M	S					S	W	M	M	S	

Course Assessment methods:

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam 5. Model exams, Lab exercises & End semester exams for lab component	1. Course Exit Survey

THEORY COMPONENT CONTENT

CHILDREN'S WEAR **10 Hours**

Designing and pattern development- measurements-standard size charts for children's wear. Quality requirements for selecting suitable fabric, seams and stitches for children wear. Step-by-step garment drafting process and construction sequence – Frocks- A-line, summer, yoke, baba suit

WOMEN'S WOVEN WEAR **10 Hours**

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 – ladies kurti, churidar, skirts - plain, gored, pleated and blouses – plain blouse, raglan blouse, katori blouse.

WOMEN'S KNIT WEAR **9 Hours**

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 **9 Hours**

Designing and pattern development – measurements – standard size charts formen'swear. 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, half sleeve shirt and single breasted coat.

MEN'S KNIT WEAR **7 Hours**

Designing and pattern development – measurements – standard size charts for men's knitwear. Step-by-step garment drafting procedure and construction sequence – elastic shorts, briefs and vests.

Theory: 45 Tutorial: 0 Practical: 0 Project: 0Total: 45 Hours

REFERENCES

1. Helen Joseph and Armstrong, "Pattern Making for Fashion Design", Pearson Education, 2005.
2. Winifred Aldrich, "Metric Pattern Cutting for Men's Wear", Blackwell Science, 2000.
3. Winifred Aldrich, "Metric Pattern Cutting for Children's Wear and Baby Wear", 3rd Edition, Black well Science, 2001.
4. Singer, "Sewing Pants That Fit", Cowles Creative Publishing Inc., 1989.
5. McKelveyKathryn, "Fashion Source Book", Black well Science, 1994
6. Gerry Cooklin, "Garment Technology ForFashionDesigners", Black well Science, 2000.
7. Claire Shaeffer, "Fabric Sewing Guide", Chilton Book Company - Radnor, Pennsylvenia.

LAB COMPONENT CONTENTS

LIST OF EXPERIMENTS

1. Designing and developing pattern for Baby set- Jabla, panty, bib and bonnet.
2 Construction of Baby set- Jabla, panty, bib and bonnet
3. Designing and developing pattern for Rompers
4. Construction of Rompers
5. DesigningandDevelopingPatternforLadiesSkirtandTop
6. ConstructionofLadiesSkirtandTop
7. DesigningandDevelopingPatternforLadiesSalwar
8. ConstructionofLadiesSalwar
9. DesigningandDevelopingPatternforLadiesKameez
10. ConstructionofLadiesKameez

Theory: 0 Tutorial: 0 Practical: 30 Project: 0 Total: 30 Hours

REFERENCES

1. Helen Joseph and Armstrong, "Pattern Making for Fashion Design", Pearson Education, 2005.
2. Winifred Aldrich, "Metric Pattern Cutting for Men's Wear", Blackwell Science, 2000.
3. Winifred Aldrich, "Metric Pattern Cutting for Children's Wear and Baby Wear", 3rd Edition, Black well Science, 2001.
4. Singer, "Sewing Pants That Fit", Cowles Creative Publishing Inc., 1989.
5. McKelveyKathryn, "Fashion Source Book", Black well Science, 1994
6. Gerry Cooklin, "Garment Technology ForFashionDesigners", Black well Science, 2000.
7. Claire Shaeffer, "Fabric Sewing Guide", Chilton Book Company - Radnor, Pennsylvenia.

U17FTI4203 FABRIC STRUCTURE AND DESIGN

L	T	P	J	C
3	0	2	0	4

Course Outcomes

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

CO1	Illustrate the elements of woven fabric design.	K3
CO2	Developelementary fabric weave structures	K3
CO3	Explain colour theory and modifications of colour	K3
CO4	Develop creative weave designs using colour and weave effects	K3
CO5	Develop structures for complex woven fabric and analyse their construction.	K3
CO6	Explain the characteristics, properties and applications of woven fabric structures	K2

Pre-requisites

U17FTT1001Weaving Technology

CO/PO Mapping

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

COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	S									M			M	
CO2		S	M							M			M	
CO3	S												M	
CO4			S							M			M	
CO5		S		M						S			M	
CO6		S											M	

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment	1.Course Exit Survey

3. Group Presentation 4. End Semester Exam	

THEORY COMPONENT CONTENT

BASIC WEAVES: 9 Hours

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.

BEDFORD CORDS AND MOCK LENO: 9 Hours

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: 9 Hours

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: 9 Hours

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: 9 Hours

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 Tutorial: 0 Practical: 0 Total: 45 Hours

REFERENCES

1. Gokarneshan.N., "Fabric Structure and Design", New Age International (P) Limited, 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

LAB COMPONENT CONTENTS

Analysis of fabrics – Commercial name & fabric appreciation

Woven Fabric Analysis

1. Plain
2. Twill
3. SatinandSateen
4. Huckaback
5. Honeycomb
6. Extra figured weaves
7. Jacquard design
8. Doublecloth
9. Pile fabric –Terry weave

Knitted fabric analysis

10. Single Jersey
11. Rib

Experiments beyond the syllabus should be conducted.

Theory: 0 Tutorial: 0 Practical: 30 Total: 30

REFERENCES

1. Grosicki Z., "Watson's Textile Design & Color: Elementary weaves & Figure", Blackwell Science, Commerce place, 1998.
2. W.S. Murphy, "Textile weaving & Design", Abhishek Publications, 2000.

U17INI4600 **ENGINEERING CLINIC - II**

L	T	P	J	C
0	0	4	2	3

Course objectives

- To help the students look into the functioning of simple to complex devices and systems
- To enable the students to design and build simple systems on their own
- To help experiment with innovative ideas in design and team work
- To create an engaging and challenging environment in the engineering lab

Course Outcomes

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

CO1: Identify a practical problems and find a solution
CO2: Understand the project management techniques
CO3: Demonstrate their technical report writing and presentation skills

Pre-requisite:

1. U17INI3600 Engineering clinic I

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

COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	S	S	S	S	S	M	W		S			S		
CO2											S			
CO3										S				

Course Assessment methods:

Direct	Indirect
1. Project reviews 50%	1. Course Exit Survey
2. Workbook report 10%	
3. Demonstration& Viva-voce 40%	

Content:

The course will offer the students with an opportunity to gain a basic understanding of

computer controlled electronic devices and apply the concepts to design and build simple to complex devices. As a practical project based embedded course, the students will be taught the concepts using a variety of reference material available in the public domain. While the course will start with formal instruction on hardware, programming and applications, the major portion of the course will provide the students with ample opportunity to be innovative in designing and building a range of products from toys to robots and flying machines.In the IV semester, students will focus primarily on raspberry pi based controllers with Python programming

GUIDELINES:

1. Practical based learning carrying credits.
2. Multi-disciplinary/ Multi-focus group of 5-6 students.
3. Groups can select to work on a specific tasks, or projects related to real world problems.
4. Each group has a faculty coordinator/Instructor who will guide/evaluate the overall group as well as individual students.
5. The students have to display their model in the 'Engineering Clinics Expo' at the end of semester.
6. The progress of the course is evaluated based on reviews and final demonstration of prototype.

Total Hours: 90

U17INT4000 **CONSTITUTION OF INDIA (Mandatory course)**

L	T	P	J	C
2	0	0	0	0

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

CO 1: Gain Knowledge about the Constitutional Law of India
CO 2: Understand the Fundamental Rights and Duties of a citizen
CO 3: Apply the concept of Federal structure of Indian Government
CO 4: Analyze the Amendments and Emergency provisions in the Constitution
CO 5: Develop a holistic approach in their life as a Citizen of India

Pre-requisites :NIL

CO/PO Mapping

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						M			W			S
CO2						S		S				M
CO3									M	S		W
CO4								W	M			M
CO5						M		M				S
CO6												

Course Assessment methods

Direct
3. Group Activity / Quiz/ Debate / Case studies 4. Class test / Assignment
Indirect
Surveys

THEORY COMPONENT:

Module.1: Introduction to Indian Constitution 4 hours
Meaning of the constitution law and constitutionalism - Historical perspective of the Constitution - Salient features and characteristics of the Constitution of India

Module.2:Fundamental Rights 8 hours
Scheme of the fundamental rights - Right to Equality - Fundamental Right under Article 19 - Scope of the Right to Life and Liberty - Fundamental Duties and its legal status - Directive Principles of State Policy – Its importance and implementation

Module.3:Federal Structure 8 hours
Federal structure and distribution of legislative and financial powers between

the Union and the States - Parliamentary Form of Government in India -

The constitutional powers and status of the President of India

Module.4:Amendment to Constitution 6 hours
Amendment of the Constitutional Powers and Procedure - The historical perspectives of the constitutional amendments in India

Module.5:Emergency Provisions 4 hours
National Emergency, President Rule, Financial Emergency
Local Self Government – Constitutional Scheme in India
Total 30 hours

Theory: 30	**Tutorial: 0**	**Practical: 0**	**Project: 0**	**Total: 30 hours**

REFERENCES

1.Constitution of India - Ministry of Law & Justice – PDF format
awmin.nic.in/coi/coiason29july08.pdf

2. Introduction to the Constitution of India by DurgadasBasu

5. The Constitution of India – Google free material -
www.constitution.org/cons/india/const.html

4. Parliament of India – PDF format
download.nos.org/srsec317newE/317EL11.pdf

5. The Role of the President of India – By Prof.Balkrishna

6. Local Government in India – E Book - Pradeep Sachdeva
https://books.google.com/books/.../Local_Government_in_In...

U17VEP4504 **PROFESSIONAL VALUES** (Mandatory)

L	T	P	J	C
0	0	2	0	0

Course Outcomes

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

CO 1: Develop the ethical values in both professional and personal life
CO 2: Develop ability to take decision to reinforce professional life
CO 3: Rational in professional skills required for diverse society
CO 4: Excel in ingenious attitude to congregate professional life
CO 5: Research into the professional stand
CO 6: Spruce an Individual with decorum to achieve professional life

Pre-requisites :

1. U17VEP1501 / PERSONAL VALUES

2. U17VEP2502 / INTERPERSONAL VALUES

3.U17VEP3503 / FAMILY VALUES

CO/PO Mapping

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1								S				
CO2				M								
CO3			S									
CO4												S
CO5								M				
CO6										M		

Course Assessment methods

Direct
1.Group Activity / Individual performance and assignment 2.Assessment on Value work sheet / Test

Indirect
1. Mini project on values / Goodwill Recognition

Values through Practical activities:

1.Professional skills With Values: Positive Attitude, Adaptability, Responsibility, Honesty and Integrity, Self Esteem, & Self Confidence

2.Building Innovative work cultures: Creative thinking, Critical thinking, Conflict Resolution, Problem Solving, & Decision making

3.Professional Work Ethics: Types of Ethics, Etiquette, personality Grooming, Emotional quotient, Human Dignity, Safety & Role of Professional in Social Responsibility

4.Engineering Ethics: Engineering Council of India - Objectives - Code of Ethics - Social responsibility -Professional Quality - Ethical issues - Effects - Strategy – Corruption, Consequences, Cures

5.Case studies in engineering ethics: Discussion of case studies relating to Public safety, health, welfare, Quality of product, Improper conduct by management, Product responsibility, Intellectual property

Workshop mode

REFERENCES

1. LEARNING TO DO SOURCEBOOK 3 - UNESCO-UNEVOC -PDF
www.unevoc.unesco.org/fileadmin/user_upload/pubs/LearningToDo.pdf

2. DECLARATION OF PROFESSIONAL VALUES AND ETHICAL STANDARDS
www.garda.ie/Documents/User/declarationvalues.pdf

3. KARMA YOGA - SWAMI VIVEKANANDA
www.vivekananda.net/PDFBooks/KarmaYoga.pdf

4. PROFESSIONAL ETHICS IN ENGINEERING - Sasurie College of Engineering
www.sasurieengg.com/.../GE2025%20Professional%20Ethics%20in%20Engineering.

5. ENGINEERING ETHICS CASE STUDY; Challenger
www.ucc.ie/en/processeng/staff/academic/ebyrne/.../PE1006PptNotesLect7.pdf

SEMESTER V

Version 1 (17.8.17)

L	T	P	PJ	C
3	1	0	0	4

U17MAT5102 DISCRETE MATHEMATICS

(FT)

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

CO1: Understand the concepts of set theory and apply them to situations involving inclusion and exclusion
CO2: Acquire the knowledge of relations, and analyse equivalence relations and their properties.
CO3: Understand and analyse the properties of different kinds of functions.
CO4: Apply mathematical induction to prove mathematical facts, analyse and use the concept of permutation and combination and solve recurrence relations.
CO5: Evaluate the validity of logical arguments and construct simple mathematical proofs.
CO6: Determine whether given graphs are isomorphic and apply Dijkstra's algorithm to find the shortest path.

Pre-requisite courses:

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M	M										
CO2	M		S									
CO3	L											
CO4	M		S									
CO5	S	S	S									S
CO6	S	S	S									S

Course Assessment methods:

DIRECT
1. Continuous Assessment Test I, II 2. Written Assignment, Offline quiz, Written tests-2 3. End Semester Examination
INDIRECT
1. Course-end survey

Topics covered:

SET THEORY **9+3 Hours**

Algebra of sets – The power set – Ordered pairs and Cartesian product – principle of inclusion and exclusion.

Relations on sets –Types of relations and their properties - Equivalence relations –Relational matrix and the graph of relation – Operations on relations.

FUNCTIONS **7+2 Hours**

Functions –Type of functions – Injective, surjective and bijective functions –Composition of functions – Inverse functions –Permutation functions.

COMBINATORICS **9+3 Hours**

Mathematical induction- The basics of counting–Permutations and combinations-Recurrence relations-Solving linear recurrence relations

LOGIC **11+4 Hours**

Propositions- Logical operators- Normal forms –Rules of inference-Consistency and inconsistency-Propositional logic- Proofs-Predicates- Quantifiers- Universe of discourse – Logical equivalences and implications for quantified statements-Rules of specification and generalization – Validity of arguments.

GRAPH THEORY **9+3 Hours**

Graphs- Types of graphs- Matrix representation of graphs- Graph isomorphism- Walk - Path- Cycles- Eulerian graphs -Hamiltonian graphs- Planar graphs- Euler formula- Shortest path algorithm: Dijkstra's algorithm

Theory: 45 Hrs **Tutorials: 15 Hrs** **Total Hours: 60 Hrs**

REFERENCES

1. Liu C.L, "Elements of Discrete Mathematics, Second Edition, McGraw Hill 1985.
2. Mott J.L, Kandel A. and Baker T.P.,"Discrete Mathematics for Computer Scientists and Mathematicians, Second Edition, Prentice Hall India, 1986.
3. J.P.Trembly, R. Manohar, Discrete Mathematical Structures with applications to Computer Science, TMHInternational Edition (Latest Edition).
4. NarsinghDeo, Graph Theory with Applications to Engineering and Computer Science, Prentice – Hall, Engle Cliffs, N. J.
5. Harary F, Graph Theory, Narosa, 1969.
6. Thomas H.C., A Leiserson C.E., Rivest R.L, Stein C.A., "Introduction to a Algorithms(2nd Edition),MIT press and McGraw-Hill.2001.

U17FTI5201 TEXTILE CHEMICAL PROCESSING

L	T	P	J	C
3	0	2	0	4

Course Outcomes

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

CO1	Acquire knowledge and explain the chemical processing of cotton and blended materials.	K3
CO2	Summarize the suitable process to process the fiber, yarn and fabrics through preparatory and dyeing processes.	K3
CO3	Analyze the parameters and Deciding the recipes for chemical processing of different materials.	K4
CO4	Acquire Knowledge and Analyze the parameters for printing techniques	K3
CO5	Testing and evaluation on the eco-friendly processes and the effluent treatments.	K4
CO6	Summarize the pollutants, banned and toxic chemicals and amines.	K2

Pre Requisite:

U17CHT1006Chemistry for Textiles

CO/PO Mapping

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

COs	Programme Outcomes(POs)													
	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO1 2	PSO 1	PSO2
CO1	W					S	S						M	M
CO2	W					S	S						M	M
CO3			M			S	S						M	M
CO4						S	S						M	M
CO5						S	S						M	M
CO6						S	S						M	M

Course Assessment methods:

Direct	Indirect
1.Internal tests 2.Assignment 3.Group Presentation 4.End Semester Exam	1.Course Exit Survey

Course Content

PRETREATMENTS **9 Hours**

Introduction to wet processing. Process sequence in wet processing for woven and knits. Singeing –electric and gas singeing. Desizing–chemical and enzymatic. Scouring –alkaline and enzymatic. Bleaching – hypo chlorite and peroxide bleaching, optical whitening. Mercerizing–tension, tensionless and tubular mercerization. Liquid ammonia treatment.

DYEING **12 Hours**

Introduction-Dyeing equipment – 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 fabricsusing direct, reactive, vat andSulphur dyes. Dyeing of polyester (carrier, HTHP and thermosol) and cellulosic blends (one bath and two bath process). Fastness properties of dyes.

PRINTING **7 Hours**

Print paste - ingredients and their functions. Styles of printing- direct style, 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 **7 Hours**

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

QUALITY 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 **Tutorial: 0** **Practical: 0** **Project: 0** **Total: 45Hours**

REFERENCES

1. 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. JohnShore, “CellulosicsDyeing”,SocietyofDyersandColourists, Mumbai,2005
5. LesileW.C. Miles, “Textile printing”, Society of Dyers and Colorists, Mumbai,2003
6. “Chemical technology inthe pre-treatment Processes of textiles”, S.R. Karmakar, ISBN: 0-444 50060-1 Nov,1999
7. DatyeK.V. and Vaidya A. A., “Chemical Processing of Synthetic Fibersand 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.

PRACTICAL COMPONENT CONTENT

1. Bleaching of cotton using hydrogen per oxide.
2. Dyeing of cotton with direct dyes on woven/knitted fabric.
3. Dyeing of cotton with cold/hot brand reactive dyes on woven/knitted fabric.

4. Dyeing of cotton with vat dyes on woven/knitted fabric.
5. Dyeing of protein fibers with acid dyes.
6. Stripping and re-dyeing of cotton fabric.
7. Dyeing of polyester using carrier.
8. Direct & discharge style of printing on cotton fabrics.
9. Resist styleprintingoncotton.
10. Determination of color fastness of dyed fabrics using launderometer

Theory: 0 Tutorial: 0 Practical: 30 Project: 0 Total: 30 Hours

U17FTI5202 TEXTILE AND APPAREL QUALITY EVALUATION

L	T	P	J	C
3	0	2	0	4

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 method of measuring yarn number	K5
CO2	Apply knowledge in principles of working of fiber &yarn testing instruments	K3
CO3	Apply knowledge in principles of working of fabric testing instruments	K3
CO4	Correlate knowledge in evaluation of fabric handle properties	K4
CO5	Acquire knowledge on testing instruments used for accessories	K4
CO6	Analyze knowledge in the measurement of fastness properties of fabrics	K4

Pre Requisite:

U17FTI4203 Fabric Structure and Design

CO/PO Mapping

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

Cos	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	S													
CO2		M												M
CO3		S												M
CO4	M	M												M
CO5	M		S				S							M
CO6			M				M							

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	1. Course Exit Survey

Course Content

Sampling and Yarn Numbering System **6 Hours**

Definition – random, biased sampling. Terms used in sampling. Sampling techniques for fiber, yarn and fabric. Moisture regain and Moisture content. Standard conditions for testing samples.Yarn count – Definition. Yarn numbering systems: Direct system, indirect system and count conversion calculations.

Fiber and Yarn Testing **12 Hours**

Fiber: High Volume Instruments (HVI): length, strength, maturity, trash& color module analysis. Advanced Fiber Information System (AFIS): length, nep and trash modules.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 –Blackboard, ASTM standards, Cutting and weighing methods. Electronic capacitance – evenness tester – Usterstandards.Yarnfaults – classification – Classimat. Measurement of yarn strength – Single yarn strength tester –Tensorapid, Tensojet - lea strength tester. CSP& its significance.

Fabric Testing - Mechanical Properties 9 Hours

Fabric tensile strength tester– Raveled strip, Cut strip, Grab methods. Fabric tear strength tester – Elmendorf strength tester. Ballistic strength tester – Hydraulic bursting strength tester. Fabric abrasion resistance – Martindale abrasion tester. Fabric Pilling - I.C.I Pillbox tester. Crimp – Influence of crimp on fabric properties–Shirley crimp tester. Fabric thickness and GSM measurements.

Fabric Testing – Aesthetics and Comfort Properties 9 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.Fabric thermal resistance tester.

Apparel and Accessory Testing 9 Hours

Seam strength and seam slippage testing. Peel bond strength, Buttonstrength, Zipper strength testing. Color fastness testing – Washing, Rubbing, Light, Perspiration fastness. Apparel dimensional stability – spirality, skewing and its measurement.

Theory: 45 Tutorial: 0 Practical: 0Project: 0 Total: 45 Hours

REFERENCES

1. ArindamBasu, “Textile Testing – Fiber, Yarn and Fabric”, The South India Textile Research Association, Coimbatore, 2001.
2. B.P. Saville, “Physical Testing of Textiles”, Wood head Publishing Limited, 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. SundaramV, “Handbook of Textile Testing”, CTRL Publication, Bombay, 2003.
5. Booth, J.E., “Principles of Textile Testing”, CBS Publishers and Distributors, 2002.
6. BSI, “BSI Hand books”, British Standard Institution, Manchester,2007
7. BIS, “BIS Hand Books”, BureauofIndianstandards, Delhi, 2007.

PRACTICAL COMPONENT CONTENT

1.Determination of yarn count and lea strength
2.Determination of single / ply yarn twist
3.Determination of fabric abrasion resistance & fabric pilling
4.Determination of fabric tensile & tear strength
5.Determination of color fastness to rubbing - crock meter& shrinkage of woven/knitted fabrics
6.Determination of fabric stiffness and crease recovery angle
7.Determination of fabric bursting strength and fabric drape.
8.Determinationofseamstrengthandseamslippage
9.Determination of zipper and buttonpullstrength
10.Determination of peel bond strength of fusible interlinings

11.Determination of wickability& wettabilityof fabrics
12.Determination of spiralityandcourse length of knitted fabrics
13.Determination of sublimation fastness and stretch & recovery of fabric.

Theory: 0 Tutorial: 0 Practical: 30 Project: 0 Total: 30 Hours

L	T	P	J	C
3	0	0	0	3

U17FTT5003 KNITTING TECHNOLOGY

Course Outcomes

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

CO1	Recognize the weft knitted fabric production processes	K2
CO2	Outline the structure and properties of various weft knitted fabrics	K3
CO3	Acquire know ledge on the structure and properties of various advanced weft knitted fabrics	K3
CO4	Recognize the structure and properties and in warp knitting	K3
CO5	Recognize the Latest developments in warp knitting	K3
CO6	Acquire knowledge on the application of knitted structures for Technical Textiles	K3

Pre Requisite:

U17FTT2001 Yarn Technology

CO/PO Mapping

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

COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PS01	PS01
CO1	S	M											M	M
CO2	S	M											M	M
CO3	S	M	W										M	M
CO4	S	M	W										M	M
CO5	S	M											M	M
CO6	S	M												

Course Assessment methods:

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	2. Course Exit Survey

PRINCIPLE OF WEFT KNITTING: **9 Hours**

Comparison of Weaving and Knitting and nonwoven-Terms anddefinitionsinweft knitting –Knitting elements-Needle sand its types,sinker, camKnitting action of latch, bearded and compound needles. –Working principle andpassage of Yarn in circular and Flat knitting machine -Classifications of knitting machines.-Comparison of Plain, circular rib,andinterlock fabrics and machines. - Yarn quality for knitting.-selection of weft knitted fabrics

WEFT KNIT STRUCTURES: **9Hours**

Classificationof weft knit structures,-Symbolic and diagrammatic representation of weft knit structures.- Comparison of single jersey, rib and interlock and purl structures-comparison knit, tuck, float Stitches–unconventional stitches –Single jersey derivatives, accordion, check and stripe effect.- Rib derivativesderbyribandSwiss rib, royal rib, polka rib- Rib gated structures Milano Rib,Doublepiqueand Pique poplin.- Knitted fabric Geometry Kc, Kw, Ks, R-knitted fabric defects-quality control

ADVANCED WEFT KNIT STRUCTURES: **9 Hours**

Eight lockstructure, Interlock gated structures Singlepique, 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- Application of weft knitted structures in technical textiles

WARP KNITTING BASICS : **9 Hours**

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, blindlap,tricot, inlay, satin and atlas stitches.

WARP KNIT STRUCTURES **9 Hours**

Fulltricot, lock knit and loop raised fabrics. Basic RaschelWarpKnit structures-power nets, curtains and laces. – Latest developments in warp knitting machines. Warp knitting calculations for GSM, production- Application of warp knitted structures in technical textiles

Theory: 45 **Tutorial: 0** **Practical: 0** **Project: 0** **Total: 45 Hours**

REFERENCES

1. DavidSpencer.,"KnittingTechnology",PergamonPress,Oxford2005
ISBN**(13):** 9781855733336

2.AnbumaniN, "Knitting – Fundamentals, Machines, Structures and Developments",NewAgeInternationalPublishers,2 0 1 0 .**ISBN(13):**978-81-224-1954-2

3AjgaonkarDB, "Principles ofKnitting", Universal Publishing Corporation, Mumbai, 1998, **ISBN**: 81-85027-34-X.

4. Chandrasekhar Iyer, Bernd Mammel and Wolfgang Schach., "Circular knitting", Meisenbach GmbH, Bamberg, 1995, **ISBN**: 3-87525-066-4.

U17FTP5504 APPAREL PRODUCTION LABORATORY

L	T	P	J	C
0	0	2	0	1

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

CO1	Develop apparel designs and fashion illustration for ladies & men's wear	K6
CO2	Prepare basic blocks for ladies wear	K3
CO3	Develop patterns as per the required styles for ladies garments	K4
CO4	Develop patterns as per the required styles for men's garments and practice grading for different sizes	K4
CO5	Practice construction of apparel, outline construction flow process for various ladies & men's garments	K4
CO6	Estimate fabric consumption by marker making and costing of apparels	K4

Pre Requisite
U17FTI3202Concepts of fashion & design
U17FTT3003 Pattern Making and Adaptation
U17FTI3204 Garment Components Fabrication
U17FTI 4202 Apparel Design Development

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak														
COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	S	M											S	W
CO2	S	S	M										S	
CO3		S	S	S									S	
CO4		S	S	S									S	
CO5			M	S					S	W	M	M	S	
CO6			M	S					S	W	M	M	M	

Course Assessment methods

Direct	Indirect
1. Model Exams 2. Lab Exercises 3. End semester Exams	1. Course Exit Survey

LIST OF EXPERIMENTS:

1. Development of basic block patterns–top, skirt and bifurcated garments and grading of any one (men's or ladies garment)
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 BasicT-shirt
12. Marker Planning for any one garment

Experiments beyond the syllabus should be conducted

Total: 30 Hours

U17INI5600 ENGINEERING CLINIC – III

L	T	P	J	C
0	0	4	2	3

Course objectives

- To help the students look into the functioning of simple to complex devices and systems
- To enable the students to design and build simple systems on their own
- To help experiment with innovative ideas in design and team work
- To create an engaging and challenging environment in the engineering lab

Course Outcomes

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

CO1: Identify a practical problems and find a solution
CO2: Understand the project management techniques
CO3: Demonstrate their technical report writing and presentation skills

Pre-requisite:

2. U17INI4600 Engineering clinic II

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

COs	Programme Outcomes(POs)													
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2
CO1	S	S	S	S	S	M	W		S			S		
CO2											S			
CO3										S				

Course Assessment methods:

Direct	Indirect
1.Project reviews 50%	1. Course Exit Survey
2.Workbook report 10%	
3.Demonstration& Viva-voce 40%	

Content:

The course will offer the students with an opportunity to gain a basic understanding of computer controlled electronic devices and apply the concepts to design and build simple to complex devices. As a practical project based embedded course, the students will be taught the concepts using a variety of reference material available in the public domain. While the course will start with formal instruction on hardware, programming and applications, the major portion of the course will provide the students with ample opportunity to be innovative in

designing and building a range of products from toys to robots and flying machines.

In the V semester, students will focus primarily on Design project combining concepts learnt in Engineering clinics I and II

GUIDELINES:

1. Practical based learning carrying credits.
2. Multi-disciplinary/ Multi-focus group of 5-6 students.
3. Groups can select to work on a specific tasks, or projects related to real world problems.
4. Each group has a faculty coordinator/Instructor who will guide/evaluate the overall group as well as individual students.
5. The students have to display their model in the 'Engineering Clinics Expo' at the end of semester.
6. The progress of the course is evaluated based on reviews and final demonstration of prototype.

Total Hours: 90

U17VEP5505 **SOCIAL VALUES**
(Mandatory)

L	T	P	J	C
0	0	2	0	0

Course Outcomes

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

CO 1: Understand the transformation from self to society
CO 2: Acquire knowledge about disparity among Human Beings
CO 3: Realize the new ethics in creating a more sustainable Society
CO 4: Develop skills to manage challenges in social issues
CO 5: Acquire the skills for Management of Social work &HolisticSociety
CO 6: Validate the social liabilities at dissimilar situations

Pre-requisites :

1. U17VEP1501 / PERSONAL VALUES
2. U17VEP2502 / INTERPERSONAL VALUES
3. U17VEP3503 / FAMILY VALUES
4. U17VEP4504 / PROFESSIONAL VALUES

CO/PO Mapping

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						S						
CO2							S					
CO3								M				
CO4											S	
CO5												S
CO6									M			

Course Assessment methods

Direct
1.Group Activity / Individual performance and assignment 2.Assessment on Value work sheet / Test
Indirect
1. Mini project on values / Goodwill Recognition

Values through Practical activities:

1. Self and Society: Relation between self and society – Different forms of society - Elements of Social structures – Realization of Duties and Responsibilities of Individual in the Society

2. Social Values: Tolerance – Responsibility – Sacrifice – Sympathy - Service – peace-nonviolence - right conduct- Unity – forgive – dedication – Honest

3. Social issues : Disparity among Human beings- Poverty-Sanitation -corruption- un employment-superstition – religious intolerance & castes – terrorism.

4. Emerging Ethics for Sustainable Society: Unison of Men in Society - Positive Social Ethics - Cause and Effect - Ensuring an Equitable Society- Effect of Social Media in society - development of Education and Science in the Society

5. Social Welfare:Social welfare Organization - Programme by Government and NGO's - Benefits of Social Service - Balancing the Family and Social Life – Development of Holistic Society

Workshop mode

REFERENCES

1. SOCIAL PROBLEMS IN INDIA - ForumIAS.com – PDF
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2. INVESTING IN CULTURAL DIVERSITY AND INTERCULTURAL DIALOGUE: UNESCO ...
   www.un.org/en/events/culturaldiversityday/pdf/Investing_in_cultural_diversity.pdf

3. INDIAN SOCIETY AND SOCIAL CHANGE - University of Calicut
   www.universityofcalicut.info/SDE/BA_sociology_indian_society.pdf

4. CULTURE, SOCIETY AND THE MEDIA - E-classwww.eclass.uoa.gr/.../MEDIA164/.../%5BTony_Bennett,_James_Curran,_Michael_G

5. SOCIAL WELFARE ADMINISTRATION - IGNOU
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SEMESTER VI

Version 1 (17.8.17)

U17FTT6001: APPAREL PRODUCTION PLANNING AND CONTROL

L	T	P	J	C
3	0	0	0	3

Course Outcomes

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

CO1	Explain the basic techniques of production planning & control in garment industry	K3
CO2	Choose production system for apparel industry based on style and quantity of merchandise	K5
CO3	Prepare and analyze the flow process grids, control forms and scheduling charts for production control in apparel industry	K4
CO4	Decide the suitable cut production analysis for various garment quantities	K4
CO5	Determine the capacity planning and line balancing techniques to achieve balanced production	K3
CO6	Update modern tools and methods of production planning and control	K2

Pre Requisite

U17FTT4001 Apparel Machinery and Equipment

CO/PO Mapping

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

COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	S								M				S	
CO2		S	M						M		S		M	
CO3		S		S	S				M	S	M		S	
CO4		S		S	S				M				S	
CO5		S			S				M	M	S		S	
CO6	S	S		S	M				M	M	S		S	

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	1. Course Exit Survey

Course Content

PRODUCTION PLANNING AND CONTROL **9 Hours**

Definition, Objectives and functions ofproduction planning and productioncontrol, Functions of PPC in garment industry. Pre-production functions, Importance of Preproduction function, Product development - steps from prototype to production sample. Lead Time, Product data management,Order quantity to shipment quantity.

PLANNING IN CUTTING **9 Hours**

Cut order planning – typesofspreads,spreadingmethods,markerutilization,economiccutquantities. Control forms in cutting department- cutting order, bundle ticket, bundlecontrolsheet.

APPAREL PRODUCTION SYSTEMS **3 Hours**

Section Production systems – wholegarmentproductionsystem,Progressivebundlesystem,Unitproductionsystem,Multipleflows ystem,modularmanufacturingsystems–theiradvantages anddisadvantages. Guide lines for choosing suitableproduction system.

FLOWPROCESSGRIDSANDCHARTS **6 Hours**

Operation Break Down and Production Sequence, Identification Of Bottle Necks And Critical Area, Operation Wise Machinery Allocation, Usage Of Special Attachments And Tools For Operation Simplifications, Production Grid And Flow Chart.

PRINCIPLES OF SCHEDULING **4 Hours**

Scheduling charts – GANTTchart,SchedulingtechniquesNetworkrepresentation– CPMandPERTTime&Action calendar

LINEBALANCING **5 Hours**

Determinationandallocationofmanpower andmachinesforbalancedproductioninexistingplantfora giventarget,applicationoflinebalancingtechniques– balancecontrol.

PLANT LOADING AND CAPACITY PLANNING **5 Hours**

Production line loading planning, Factory Capacity planning ,Determinationofmachinerequirements fora new factory -calculation of labor requirements

PRODUCTION CONTROL **4 Hours**

Production control forms, Modern Methods in Cut Piece Distribution and Tracking in different Manufacturing Systems, Production planning softwares.

Theory: 45 **Tutorial: 0** **Practical: 0** **Project: 0** **Total: 45 Hours**

REFERENCES

1. GargR.K,andSharmaV.,"ProductionPlanningandControlManagement",DhanpatRaiPublishing,2003.
2. Jacob Solinger, "Apparel Production Handbook", ReinholdPublications,1998.
3. Telsang (Martand) "Industrial Engineering and Production Management" S. Chand & Company Limited, 2008
4. RajeshBheda"ManagingProductivityofApparelIndustry" CBIpublishersanddistributors,NewDelhi2002.
5. DavidJTyler,"MaterialManagementinClothingProduction",PrenticeHall,Newjersey,1991.
6. Churter, A.J., "Introduction to Clothing Production Management", Oseney Mead,2001
7. CarrHarold,LathamBarbara,"TheTechnologyofClothingManufacture",OmBookService, 2004.

L	T	P	J	C
3	0	0	0	3

U17FTT6002 APPAREL MERCHANDISING AND COST MANAGEMENT

Course Outcomes

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

CO1	Acquire knowledge in basic principles of merchandising	K2
CO2	Acquire knowledge in sourcing and documentation	K2
CO3	Describe the factors that determine the cost of apparel products	K2
CO4	Calculate the CMT cost for different types of garments	K4
CO5	Evaluate the cost of apparel products based on various specifications of garments	K5
CO6	Acquire knowledge on various pricing techniques, budgeting and cost volume profit analysis	K2

Pre Requisite : NIL

CO/PO Mapping

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

COs	Programme Outcomes(POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		S								S				
CO2		S		S										
CO3	S	S		S							S	S		
CO4		S									S		S	
CO5		S									S	S	S	
CO6		S							S		S			

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. Tutorial 5. End Semester Exam	1. Course Exit Survey

MERCHANDISING **9 Hours**

Definition of merchandising. Classification ofexporters-Manufacturerexporter,Merchantexporter,Jobworker(CM/CMT),

Functions of merchandising division - Role and responsibilities of a merchandiser-differenttypesofbuyers.Communicationswiththebuyers -awareness of current market trends– product development- line planningandlinepresentation.

SOURCING AND DOCUMENTATION **9 Hours**

Need for sourcing-sourcing materials-manufacturing resources planning-principles of

MRP.Sourcing strategies- Overseas sourcing. Supply chain and demand chain analysis- Materials management for quick response.

Order confirmation, various types of export documents, Pre-shipment, Post -shipment documentation, Terms of sale, payment, shipment etc.

COST ACCOUNTING: 6 Hours

Objectives, uses of cost accounting.Elements of cost. Direct material, Directlabour, Factory overheads. Cost- Fixed, variable, semi variable. Estimating and costing-

RAW MATERIAL AND CMT COST: 9 Hours

Factors that determine cost of garments- material cost- cost of yarn, cost of fabric production, cost of processing. Width and design of fabric affecting cost. Accessories and their costing. Packing and labeling cost

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

GARMENT PRICING AND CVP ANALYSIS 12 Hours

Determining pricing of apparel products: sample costing-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.

Ratio analysis, price / volume analysis. Break even analysis. Depreciation. Budgeting for apparel industry.

Theory: 45 Tutorial: 0 Practical: 0 Project: 0 Total: 45 Hours

REFERENCES

1. Philip Kotler, Kelvin Lane Keller, Abraham Koshy and MithileshwarJha, "MarketingManagementaSouthAsianPerspective",PearsonEducationIndia, 2006.
2. John Donnellan"MerchandiseBuyingand Management", FarichildPublications,inc.,NewYork,2002.
3. M.Y.KhanandP.K.Jain"CostAccounting",HillpublishingLtd.,New Delhi, 2007.
4. Ruth E.GlockandGraceI. Kunz,"ApparelManufacturingSewnProduct Analysis",DorlingKindersley(India)Pvt.Ltd.,2005.
5. Chakraborty S K, "Cost Accounting and Financial Management", New age International, 2004.
6. RuthEGlockandGraceIKunz,"ApparelManufacturing",PrenticeHall,NewJersey,FourthEdition,2005.

U17FTT6003 INDUSTRIAL ENGINEERING IN APPAREL INDUSTRY

L	T	P	J	C
3	0	0	0	3

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	K3
CO2	Demonstrate modern industrial engineering methods and scientific solutions to apparel manufacturing towards economic, environmental, and societal context	K4
CO3	Perform as industry leaders in the global marketplace, capable of successfully planning, controlling, and implementing large-scale projects	K4
CO4	Understand and apply the principles of science, technology, engineering, and math involving industry-relevant problems	K4
CO5	Acquire skills to investigate, experiment and solve problem in context with productivity improvement and material handling	K5
CO6	Acquire skills to implement IE techniques in sewing floor of any apparel manufacturing firm	K4

Pre Requisite :

U17FTI3204 Garment components fabrication

CO/PO Mapping

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

COs	Programme Outcomes(POs)													
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12	PSO 1	PSO 2
CO1	S												S	
CO2					S	S						M	M	
CO3				M									M	
CO4	M			S									M	
CO5		M		S									M	
CO6				S	S				M				M	

Course Assessment methods:

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

INTRODUCTION: **9 Hours**

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

Productivity: Definition-Productivity, Productivity measures .Causes for low productivity in apparel industry and measures for improvement.

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

WORK ENVIRONMENT **9Hours**

Lighting, Ventilation, Climatic condition onproductivity. Temperature control, humidity control, noise controlmeasures.Safetyandergonomicsonworkstationandworkenvironment

Material Handling– Objectives, Classification and characteristics ofmaterialhandlingequipments,Specializedmaterialhandlingequipments.

METHODSTUDY: **9 Hours**

Definition,Objectives,Procedure,Process chartsandsymbols.Variouscharts– Chartsindicatingprocess sequence:Outlineprocesschart,flowprocesschart(mantype,materialtypeandequipment type);Chartsusingtimescale–multipleactivitychart.Diagramsindicatingmovement –flow diagram, string diagram, travel chart

MOTION STUDY: Principle of motion economy, Twohanded processchart,micromotionanalysis–therbligs,SIMOchart.

WORK MEASUREMENT: **9 Hours**

Definition, purpose, procedure,equipments,techniques.Time study- Definition, basicsoftime study- equipments.Time studyforms, Stop watch procedure.Predeterminedmotiontimestandards(PMTS).TimeStudyrating,calculationofstandardtime,Performancerating–relaxationandotherallowances. Calculation of SAM for different garments, GSD.

WORK STUDY APPLICATION: **9 Hours**

Application of workstudytechniques in cutting,stitchingandpackingingarmentindustry. Workaids in sewing, Line balancing, Capacity planning, scientific method of training,Value

engineering, LEAN manufacturing.

Theory: 45 Tutorial: 0 Practical: 0 Project: 0 Total: 45 Hours

REFERENCES

1 . Johnson Maurice"Introductionof Work Study", International LabourOrganization, Geneva,2005.
2. V.RameshBabu "Industrial Engineering in Apparel Production" Woodhead publishing India PVT ltd, 2012
3. Rajesh Bheda, "Managing Productivity in Apparel Industry "CBS Publishers & Distributors, ISBN8123909217, 9788123909219, 2008
4. Chuter A. J., "Introduction to Clothing Production Management", Black well Science, U. S. A., 1995
5. Dr. Prabir Jana and Dr. ManojTiwari.Industrial Engineering in Apparel Manufacturing: Practitioner's Handbook Apparel resources Pvt Ltd. ISBN-10: 8193247205
6. J. K. Akhil,Apparel Engineering: Industrial Engineering Methods for Apparel IndustryCreatespace Independent Pub; 01 edition (20 March 2016) ISBN-10: 1515127125
7. Prasantasarkar,Industrial Engineering Guide to Job Interview Preparation, Online Clothing Study; 1 edition (2014) ISBN-10: 9383303751
8. https://nptel.ac.in/courses/112107142
9. www.onlineclothingstudy.com

L	T	P	J	C
0	0	2	0	1

U17 FTP6504 APPAREL CAD LABORATORY

Course Outcomes

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

CO1	Develop Computer aided pattern drafting for different apparels	K3
CO2	Develop the skill of grading various apparel patterns using CAD	K3
CO3	Create and manipulate efficient marker plans	K4
CO4	Construct specification sheets for garments as per requirements	K3
CO5	Estimate the fabric consumption	K3
CO6	Develop cut order plan	K4

Pre Requisite

U17FTI 4202 Apparel Design and Development

CO/PO Mapping

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

CO	Programme Outcomes(POs)													
	PO 1	PO 2	PO 3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2
CO 1		S			S				S	M			S	S
CO 2		S			S				S	M			S	S
CO 3		S			S				S	M			M	M
CO 4		M			S								M	M
CO 5					M								M	M
CO 6					M				S	M			M	M

Course Assessment methods

Direct	Indirect
1. Lab Model Exams 2. Lab Exercises 3. End semester Exams	1. Course Exit Survey

LISTOFEXPERIMENTS:

1. Develop pattern, grading for children's wear– Baby frock using a one way fabric of 38"and 42"width.
2. Develop pattern, grading for children's wear–Rompers using a two-way fabric of 38"and 42"width.
3. Develop a specification sheet for a children'swear–Rompers
4. Develop pattern, grading and marker plan for a Ladies top with fabric of 44"and 52" width. Calculate the fabric consumption. Develop a specification sheet for the Ladies top.
5. Develop pattern and marker plan for a Men's Basic T shirt of 48" fabric width.Calculate the

fabric consumption. Develop a specification sheet for a Men's BasicTshirt. Develop a cut order plan

6. Develop pattern and gradingandmarkerplan for Men's Formal Trouser using fabric of 60" and 72" width. Calculate the fabric consumption. Develop a specification sheet for Men's Formal Trouser.
7. Develop pattern and gradingandmarkerplan for Ladies Full Gown using fabric of 48" width. Calculate the fabric consumption. Develop a specification sheet for Ladies Full Gown.
8. Developpattern, grading and marker plan for a Ladies Skirt using plaid fabric of 38"and 60" width. Calculate the fabric consumption. Develop a specification sheet for Ladies Skirt. Develop a cut order plan
9. Develop pattern, grading and marker plan for a Men's Full arm shirt using fabric of 60"and 72"width. Calculate the fabric consumption. Develop a specification sheet for Men's Full arm shirt.
10. Develop pattern, grading and marker plan for SalwarKameezusingfabric of 60"and 72"width.Calculate the fabric consumption.
11. Develop pattern and grading for a blazer usingfabricof60"and 72"width.Calculate the fabric consumption.
12. Develop pattern, grading and marker plan for a Men's vest and brief using fabric of 38"and 42"width.Calculate the marker efficiency and fabric consumption. Develop a specification sheet for vest and brief. Develop a cut order plan.

Experiments beyond the syllabus should be conducted

Total: 30 Hours

U17FTP6505 PORTFOLIO PRESENTATION I

L	T	P	J	C
0	0	2	0	1

Course Outcomes

CO1	Acquire knowledge on conducting design research through market study.	K5
CO2	Understand brand identity and develop a brand note and a concept note.	K6
CO3	Create client profiles who can be potential customers to the designs created.	K6
CO4	Select a theme and outline a mind map relevant to the theme.	K5
CO5	Understand the process of fashion forecasting and its importance.	K5
CO6	Interpret and relate fashion forecasts to choose colours and designs based on the theme to meet the needs of the export market.	K5

Pre-requisite:

U17FTI4202-Apparel Design and Development

CO/PO Mapping
(S/M/W indicates strength of correlation); S-Strong, M-Medium, W-Weak

COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		S		S									M	
CO2			S		S	S	M	S				S	S	S
CO3					S					S			M	
CO4		S				S	S	S			S		S	S
CO5											M		S	
CO6		S	S							S		S	S	S

Course Assessment methods:

Direct	Indirect
1. Model Exams 2. Lab Exercises 3. End semester Exams/Final presentation	1. Course End Survey

GUIDELINES:

The following have to be prepared:

1. Design Research
2. Conceptualization
3. Client profile.
4. Theme board
5. Color board
6. Forecast board

Total: 30 Hours

U17INI6600	ENGINEERING CLINIC – IV	L	T	P	J	C
		0	0	4	2	3

Course objectives

- To help the students look into the functioning of simple to complex devices and systems
- To enable the students to design and build simple systems on their own
- To help experiment with innovative ideas in design and team work
- To create an engaging and challenging environment in the engineering lab

Course Outcomes

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

CO1: Identify a practical problems and find a solution
CO2: Understand the project management techniques
CO3: Demonstrate their technical report writing and presentation skills

Pre-requisite:

1. U17INI5600 Engineering III

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

COs	Programme Outcomes(POs)													
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2
CO1	S	S	S	S	S	M	W		S			S		
CO2											S			
CO3										S				

Course Assessment methods:

Direct	Indirect
1. Project reviews 50%	1. Course Exit Survey
2. Workbook report 10%	
3. Demonstration& Viva-voce 40%	

Content:

The course will offer the students with an opportunity to gain a basic understanding of computer controlled electronic devices and apply the concepts to design and build simple to complex devices. As a practical project based embedded course, the students will be taught the concepts using a variety of reference material available in the public domain. While the course will start with formal instruction on hardware, programming and applications, the major portion of the course will provide the students with ample opportunity to be innovative in

designing and building a range of products from toys to robots and flying machines.

In the VI semester, students will focus primarily on Reverse engineering project to improve performance of a product and Design and developing a prototype.

GUIDELINES:

1. Practical based learning carrying credits.
2. Multi-disciplinary/ Multi-focus group of 5-6 students.
3. Groups can select to work on a specific tasks, or projects related to real world problems.
4. Each group has a faculty coordinator/Instructor who will guide/evaluate the overall group as well as individual students.
5. The students have to display their model in the 'Engineering Clinics Expo' at the end of semester.
6. The progress of the course is evaluated based on reviews and final demonstration of prototype.

Total Hours: 90

U17VEP6506 **NATIONAL VALUES**
(Mandatory)

L	T	P	J	C
0	0	2	0	0

Course Outcomes

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

CO 1: Acquire knowledge on the Essence of Indian Knowledge Tradition

CO 2: Know the great Indian personalities and follow their trail

CO 3: Understand the specialty of democracy

CO 4: Disseminate our Nation and its values to propagate peace

CO 5: Contribute with their energy and effort for a prosperous India

CO 6: Propagate the youth and the contribution for development of our Nation

Pre-requisites :

1. U17VEP1501 / PERSONAL VALUES
2. U17VEP2502 / INTERPERSONAL VALUES
3. U17VEP3503 / FAMILY VALUES
4. U17VEP4504 / PROFESSIONAL VALUES
5. U17VEP5505 / SOCIAL VALUES

CO/PO Mapping

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1						S						
CO2									M			
CO3							M					
CO4								S				
CO5											S	
CO6												M

Course Assessment methods

Direct
1.Group Activity / Individual performance and assignment 2.Assessment on Value work sheet / Test

Indirect
1. Mini project on values / Goodwill Recognition

Values through Practical activities:

1. Essence of Indian Knowledge Tradition:
Basic structure of Indian Knowledge System - Modern Science and Indian Knowledge System - Yoga and Holistic Health care - Case studies - Philosophical Tradition - Indian Linguistic Tradition - Indian Artistic Tradition.

2. Great Indian Leaders : Ancient rulers - Freedom fighters - Social reformers -Religious and Spiritual leaders - Noble laureates -Scientists – Statesman.

3. Largest Democracy : Socialist -Secular - Democratic and Republic – special features of Indian constitution – Three pillar of Indian democracy - Fundamental rights – Duties of a citizen – centre state relationship.

4. India's Contribution to World peace : Nonaligned Nation – Principle of PanchaSheela – Mutual respect, non-aggression, non-interference, Equality and cooperation – Role of India in UNO -Yoga India's gift to the world.

5. Emerging India : World's largest young work force - Stable Economic development - Labor market & Achievement in space technology – Value based Social structure. Emerging economic superpower.

Workshop mode

REFERENCES

1. KNOWLEDGE TRADITIONS AND PRACTICES OF INDIA, *CBSE Publication* *cbseacademic.nic.in/web_material/Circulars/2012/68_KTPI/Module_6_2.pdf*

2. CULTURAL HERITAGE OF INDIA - SCERT Kerala www.scert.kerala.gov.in/images/2014/HSC.../35_Gandhian_Studies_unit-01.pdf

3. LEARNING TO DO: VALUES FOR LEARNING AND WORKING TOGETHER - UNESCO www.unesdoc.unesco.org/images/0014/001480/148021e.pdf

4. INDIA AFTER GANDHI.pdf - RamachandraGuha - University of Warwick www2.warwick.ac.uk/fac/arts/history/students/modules/hi297/.../week1.pdf

5. INDIA'S CONTRIBUTION TO THE REST OF THE WORLD - YouSigma www.yousigma.com/interesting facts/indiasgifttotheworld.pdf

6. INDIA AS AN EMERGING POWER - International Studies Association web.isanet.org/Web/Conferences/.../11353cac-9e9b-434f-a25b-a2b51dc4af78.pdf

SEMESTER VII

Version 1 (17.8.17)

U17FTT7001 APPAREL BRAND MANAGEMENT

L	T	P	J	C
3	0	0	0	3

Course Outcomes

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

CO1	Acquire knowledge on branding strategy and positioning	K2
CO2	Apply the brand building and extension strategies	K3
CO3	Analyze the brand management and global branding techniques	K4
CO4	Acquire knowledge on Advertising types and advertisement business	K3
CO5	Demonstrate ability to create advertisement message, select media, and work out budget.	K5
CO6	Analyze the process of budgeting in advertisement business	K5

Pre-requisites: NIL

CO/PO Mapping

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

COs	Programme Outcomes(POs)													
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12	PSO 1	PSO 2
CO1		M	M	M	S								M	
CO2		M	M	M	S		M		S	M		M	M	M
CO3		M	M	M	S	S	M		S	M	M	M	M	M
CO4		M	M	M	S	S	M	M	M	M			M	M
CO5		M	M	M	S	S	M	M	S	M		M	M	M
CO4		M	M	M	M		M		M	M	M		M	M

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	2. Course Exit Survey

Course Content

BASICS OF BRANDING **9 Hours**

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 **9 Hours**

Consumer branding, technology branding, corporate branding, retail branding. Brand extension: Concept, evaluation of opportunities, factors influencing extension, extension guidelines.

GLOBAL BRANDING **9 Hours**

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 **9 Hours**

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 **9 Hours**

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 **Total: 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.

L	T	P	J	C
3	0	0	0	3

U17FTT7002 APPAREL RETAIL MANAGEMENT

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

CO1	Gain knowledge on the fundamentals of retailing	K2
CO2	Relate the aspects of customer behavior and retailing	K4
CO3	Acquire Knowledge on management of merchandise	K3
CO4	Understand the importance of effective location for retailing	K2
CO5	Understand the importance of atmospherics and space management of retail outlets	K2
CO6	Develop skills in retail pricing and strategies in promotional activities	K2

Pre Requisite:

U17FTI4202Apparel Design and Development

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak														
COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	W					M	M						M	
CO2	W	W							M	M	M	M	S	
CO3	W	M	M						M	M	M	M	S	S
CO4	W	M	S			M	M		M	M	M	M	S	S
CO5	W	M	S			M	M		M	M	M	M	S	S
CO6	W	M	S			M	M		M	M	M	M	S	S

Course Assessment methods:

Direct	**Indirect**
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	1. Course Exit Survey

Course Content

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.

RETAIL CUSTOMER BEHAVIOUR **4 Hours**

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 **5 Hours**

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 **7 Hours**

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, store space management, walls as retail selling tools, colourplanning, 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**

REFERENCES

1. MikeEasey,“FashionMarketing“,BlackwellScientificPublications, 2002
2. Gibson G. Vedamani, “Retail Management Functional Principles andPractices”,JaicoPublishingHouse,SecondEdition,2002
3. NairSuja.R,"RetailManagement",HimalayaPublishingHouse,2008.
4. BajajChetanSrivatsaTuli,"RetailManagement",OxfordUniversityPress, 2008.
5. FlemingPeter,"AGuidetoRetailManagement":Adviceonretailoperation,customerserviceandsalesteam,JaicoPublishingHouse,Mumbai,2007.
6. Gopal,"RetailManagement:AnIntroduction",ICFAIUniversitypress,2006.

U17FTP7503 PORTFOLIO PRESENTATION II

L	T	P	J	C
0	0	2	0	1

Course Outcomes

CO1	Collection of fabric swatches and understand their properties and use.	K3
CO2	Collection of garment trims & accessories and possible embellishments that can be adapted into the garment.	K3
CO3	Creation of a pattern (doodle) board relevant to the concept.	K3
CO4	Develop sketches of men's wear and women'swear and present the same as a fashion design board.	K6
CO5	Manufacture prototype of the garment and develop documents (Spec sheets) to enable effective communication in the apparel industry.	K6
CO6	Estimation ofthe garment cost based on the sample developed.	K5

Pre-requisite:

All Apparel relevant courses from Semester I to Semester VIII

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

COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		S		S									M	
CO2			S		S	S	M	S				S	S	S
CO3					S					S			M	
CO4		S				S	S	S			S		S	S
CO5											M		S	
CO6		S	S							S		S	S	S

Course Assessment methods:

Direct	Indirect
4. Model Exams 5. Lab Exercises 6. End semester Exams/Final Presentation	1. Course End Survey

GUIDELINES:

The following have to be prepared:

1. Sourcing Board – Fabrics
2. Sourcing Board – Trims
3. Pattern (doodle) development board
4. Fashion design presentation board – 5 nos.
5. Product development - One men's wear,
6. Product development - one women's wear
7. Spec sheet (Tech pack)
8. Costing sheet

Total: 30 Hours

U17FTP7701 PROJECT PHASE I

L	T	P	J	C
0	0	0	6	3

Course Outcomes

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

CO1	Ability to survey literature relevant to the topic under consideration
CO2	Design a research problem using sound scientific principles.
CO3	Understand the standards and practices used in industry/ research organization/In-house research
CO4	Perform statistical operations and analyze results
CO5	Interpret results and derive new information
CO6	Work individually or in a team to identify, troubleshoot and build products for environmental and societal issues with effective communication skills and communicate results to a scientific audience.

Pre Requisite : All core theory and lab courses

CO/PO Mapping

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

COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		S												
CO2			S						S					
CO3					M									
CO4		M		S										
CO5								M						
CO6					S		S		S	S				S

Course Assessment methods:

Direct	Indirect
1. Project reviews 2. viva 3. demo	1. Course End Survey

U17VEP7507 **GLOBAL VALUES**
(Mandatory)

L	T	P	J	C
0	0	2	0	0

Course Outcomes

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

CO 1: Aware of the concept of Universal Brotherhood and support the organizations which areworking for it

CO 2: Follow the path of Ahimsa in every aspect of their life

CO 3: Uphold the Universal declaration of Human Rights

CO 4: Understand the unequal distribution of wealth in the World and bestow their efforttowards inclusive growth

CO 5: Sensitize the environmental degradation and work for the sustainable development

CO 6: Amalgamate harmony through Non-violence and edify the nation headed for Upholdingdevelopment

Pre-requisites :

1. U17VEP1501 / PERSONAL VALUES
2. U17VEP2502 / INTERPERSONAL VALUES
3. U17VEP3503 / FAMILY VALUES
4. U17VEP4504 / PROFESSIONAL VALUES
5. U17VEP5505 / SOCIAL VALUES
6. U17VEP6506 / NATIONAL VALUES

CO/PO Mapping

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

COs	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1							M					
CO2								S				
CO3									M			
CO4						S						
CO5											M	
CO6												S

Course Assessment methods

Direct

1.Group Activity / Individual performance and assignment 2.Assessment on Value work sheet / Test
Indirect
1. Mini project on values / Goodwill Recognition

Values through Practical activities:

1. Universal Brotherhood : Meaning of Universal Brotherhood- Functioning of Various organization for Universal human beings -Red Cross, UN Office for Humanitarian Affairs – Case study on humanitarian problems and intervention - Active role of Students/Individual on Universal Brotherhood.

2. Global Peace, Harmony and Unity : Functions of UNO - Principal Organizations - Special organization – Case study relating to disturbance of world peace and role of UNO – Participatory role of Students/Individual in attaining the Global peace and Unity.

3. Non-Violence : Philosophy of nonviolence- Nonviolence practiced by Mahatma Gandhi – Global recognition for nonviolence - Forms of nonviolence - Case study on the success story of nonviolence– Practicing nonviolence in everyday life.

4. Humanity and Justice: Universal declaration of Human Rights - Broad classification - Relevant Constitutional Provisions– Judicial activism on human rights violation - Case study on Human rights violation– Adherence to human rights by Students/Individuals.

5. Inclusive growth and sustainable development : Goals to transform our World: No Poverty - Good Health - Education – Equality - Economic Growth - Reduced Inequality – Protection of environment – Case study on inequality and environmental degradation and remedial measures.

Workshop mode

REFERENCES

1. TEACHING ASIA-PACIFIC CORE VALUES OF PEACE AND HARMONY – UNICEF
   www.unicef.org/.../pdf/Teaching%20Asia-Pacific%20core%20values.pdf

2. THREE-DIMENSIONAL ACTION FOR WORLD PROSPERITY AND PEACE- IIM Indore - www.iimidr.ac.in/.../Three-Dimensional-Action-for-World-Prosperity-and-Peace-Glo...

3. MY NON-VIOLENCE - MAHATMA GANDHI
   www.mkgandhi.org/ebks/my_nonviolence.pdf

4. HUMAN RIGHTS AND THE CONSTITUTION OF INDIA 8th ... - India Juris
www.indiajuris.com/uploads/.../pdf/l1410776927qHuman%20Rights%20080914.pdf

5. THE ETHICS OF SUSTAINABILITY – Research Gate
www.researchgate.net/file.PostFileLoader.html?id...assetKey..

SEMESTER VIII

Version 1 (17.8.17)

U17FTP8701 PROJECT PHASE II

L	T	P	J	C
0	0	0	24	12

Course Outcomes

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

CO1	Ability to survey literature relevant to the topic under consideration
CO2	Design a research problem using sound scientific principles.
CO3	Understand the standards and practices used in industry/ research organization/In-house research
CO4	Perform statistical operations and analyze results
CO5	Interpret results and derive new information
CO6	Work individually or in a team to identify, troubleshoot and build products for environmental and societal issues with effective communication skills and communicate results to a scientific audience.

Pre Requisite : All core theory and lab courses

CO/PO Mapping

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

COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		S												
CO2			S						S					
CO3					M									
CO4		M		S										
CO5								M						
CO6					S		S		S	S				S

Course Assessment methods:

Direct	Indirect
1. Project reviews 2. viva 3. demo	1. Course End Survey

PROGRAMME ELECTIVES

Version 1 (17.8.17)

FASHION DESIGNING

Version 1 (17.8.17)

U17FTE0001 APPAREL PRODUCT DEVELOPMENT

L	T	P	J	C
3	0	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	K2
CO2	Define knowledge on developing fashion concepts such as concept generation, concept screening, line concept etc. Create fashion idea, manipulation of design elements.	K3
CO3	Ability to identity creative design, develop prototype, line adoption. Knowledge on technical design.	K6
CO4	Acquire skills on product positioning strategy, sizing and fit in material selection, final assembly and finishing, garment presentation.	K3
CO5	Acquire knowledge on defining proto development – fabric sourcing and selection. Analysis of functional and aesthetics of fabrics and trims.	K5
CO6	Development of Visualization and communication design on to manufacturability.	K6

Pre Requisite : Nil

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

Cos	Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO 12
CO1		S	S	S								
CO2	S	S	S	S								
CO3	M	S	S	S	M							
CO4	S	S	S									
CO5		S	S		M					M		
CO6		S	S		S				S	S		

Course Assessment methods:

Direct	Indirect
Internal tests, Assignment, Group presentation End Semester Exam	Course End Survey

Course Content

FASHION INDUSTRY OVERVIEW : 9 Hours

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: 9 Hours

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: 9 Hours

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: 9 Hours

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

PROTO DEVELOPMENT: 9 Hours

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 HoursTotal: 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, Innovation and Practice”, Blackwell Publishing, USA, 2005.
4. Donald R.Lehmann, RusellS.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.

L	T	P	J	C
3	0	0	0	3

U17FTE0002 SURFACE ORNAMENTATION

Course Outcomes (COs)
After successful completion of this course, the students should be able to

CO1	Acquire skills in design development for the traditional designs and techniques of India	K4
CO2	Develop knowledge in classification and gain skill to select parameters for raw materials and tools for surface ornamentation	K2
CO3	Acquire skills in identifying and developing samples for different hand embroidery stitches	K3
CO4	Acquire skills in identifying and developing samples for different traditional embroidery stitches	K3
CO5	Recognize and identify the machine embroidery types and processes	K3
CO6	Develop suitable designs and surface ornamentation for new product development	K6

Pre Requisite
U17 FTI3202 Concepts of Fashion and Design

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak														
Cos	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	M	S	S		S		S	S					S	
CO2	M	S	M										S	
CO3	M	S	M										S	
CO4	S	S											S	
CO5	S	M											S	
CO6	M	M	S	S	S				S	S	S	S	S	M

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment – Mini project 3. Group Presentation 4. End Semester Exam	1. Course Exit Survey

Course Content

INTRODUCTION TO DESIGN DEVELOPMENT: 11 hours
Introduction & Overview of the traditional designs of India-Analysis of characteristics and

design development for products using techniques like block printing, stenciling, screen printing, tie and dye,batik ,Kalamkari, Painting& Embroidery.

EMBROIDERY AS SURFACE ORNAMENTATION: 7 Hours

Meaning and importance- Types and Classification. Study and compatibility of needles, thread, frames, backing materials and fabrics for embroidery. Attachments to sewing machines for embroidery.

HANDEMBROIDERY&INDIANTRADITIONALEMBROIDERY: 11Hours

Hand embroidery stitches- classification- running, couching, buttonhole, satin, long and short, wheat, chain, stem, herring bone,crossstitch,knottedstitches, fish bone.

Indian traditional embroidery: Phulkari, Kasuti, Kashida, Kutch work, Chikkankari, Kantha, Tribal embroidery stitches, designs,colorsandmaterialsused.

MACHINE EMBROIDERIES AND SURFACE ORNAMENTATION: 7 Hours

Types & working methods - eyelet work, cut work, lace work, drawn thread work, drawn fabric work, patch work, mirror work, applique, shaded embroidery, shadow work, badalawork,bead and sequins work and bobbin thread embroidery.

PRODUCT DEVELOPMENT: 9 Hours

Development process: planning a collection, designer boards and Look book preparation for a new product with inspiration as surface ornamentation .

Theory : 45 Hours **Total: 45 Hours**

REFERENCES

1. ParulBhatnagar, "Traditional Indian Costumes and Textiles", AbhishekPublications,Chandigarh,2004.
2. Jay Diamond and Ellen Diamond, "Fashion, Apparel, Accessories, HomeFurnishings"PearsonPrenticeHall,NewJersey,2007.
3. UshaSrikant,"Designsforalifetime",SamataEnterprises,Mumbai, 2002.
4. ShailajaD. Naik, "Traditional Embroideries of India", A.P.H PublishingCorporation,NewDelhi,1996.
5. GiniStephensFrings,"Fashion-FromConcepttoConsumer",PrenticeHall,NewJersey,1999.
6. SheilaPaine,"EmbroideredTextiles",ThamesandHudsonLtd.,1990.
7. Kathryn McCelvey and Janine Munslow, ―Fashion Design: Process, Innovation and Practice‖, Blackwell Publishing, USA, 2005.
8. Diane.T and Cassidy. T, ―Color forecasting, Blackwell Publishing, 2005
9. RusselGillow and Nicholas Barnard, ―Traditional Indian Textiles, Thames and Hudson Ltd., London, 1991.

U17FTE0003 VISUAL MERCHANDISING

L	T	P	J	C
3	0	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 merchandise including interior, exterior and point of displays
CO4	Appraise on various techniques used in presenting merchandise
CO5	Plan on optimizing the merchandise and retail space to customers
CO6	Summarize the various features available in a computer controlled visual merchandising

Pre Requisite:

U17FTI3202ConceptsofFashion and Design

CO/PO Mapping

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

Cos	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		S											S	S
CO2		S								S				S
CO3		S								S			S	
CO4		S	S							S			S	S
CO5				M										
CO6					M									S

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	1.Course Exit Survey

Course Content

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,DepartmentStore 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 moodingarmentdisplay.

MANNEQUINS AND FIXTURES **6 Hours**

Mannequins and other human forms,alternativestomannequins. 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 **5 Hours**

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,racetrack, freeformand their direction of flow. Floor plans and reading of floor plans – P lan-o-gram- definition, purpose and planning -theme, ensemble, racks, shelves, bins,etc. Assortment planning- Assortment planning, Optimize apparel assortments Display calendar and planning a display, scheduling the promotion, budgeting and safety factors in visual merchandising.

COMPUTER AIDEDVISUAL MERCHANDISING **5 Hours**

CAD in store design,Informationtechnology 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,NewYork,2001.
2. Diamond.J,Diamond,E.,"ContemporaryVisualMerchandising", Prentice HallInc.NewJersey2003.
3. Diamond.E,FashionRetailing–AMultichannelApproach,IIEdition,Prentice HallInc.NewJersey2006.
4. RathP.M.,PetersonJ., Greensley.P, Gill.P, Introduction to Fashion Merchandising,DelmarPublishersInc.,NewYork1994.
5. PhillipsP.M.,FashionSalesPromotion,IIEdition,PrenticeHallInc, NewJersey,1996.
6. CurtisE,FashionRetail,JohnWileyandSonsLtd,England,2004.

U17FTE0004 FASHION BOUTIQUE MANAGEMENT

L	T	P	J	C
3	0	0	0	3

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

CO1	Acquire knowledge on creating a business plan	K3
CO2	Analyze the factors affecting boutique design and development	K4
CO3	Acquire knowledge on boutique operations management	K3
CO4	Create new strategies for marketing and promotion	K6
CO5	Understand the procedure for financial planning and startup formalities	K5
CO6	Develop project proposal to start a Fashion Boutique	K6

Pre Requisite : Nil

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak													
COs	Programme Outcomes(POs)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO12	PSO 1	PSO 2
CO1	M			S			S						M	
CO2		M	S		S	S	S			S		M	W	
CO3		S	S		S	S	S	S		S		S	S	S
CO4		M		S	M				S	S		S	S	S
CO5		S									S	M	S	
CO6				S					M	M	S		S	

Course Assessment methods:

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	1. Course Exit Survey

Course Content

Business plan **9 Hours**

Scope for boutiques – creation of business plan for starting a boutique- parts of a business plan – components of a business plan – types of business plans – Competitive analysis & case study analysis -Assessment of Feasibility (Technical, Financial & Marketing) - finding the right plan

Boutique design & development **9 Hours**

Location decision- importance, levels and determining factors. Types of location, types of consumer goods and location decision. Exterior Design, Store Layout & Space management,

Atmospherics, colour planning, physical materials in store designing, atmospherics in the context of internet retailing.

Boutique Operations Management **9 Hours**

Business Model – online & offline - store design, visual merchandising & display, customer service, budgeting & accounting, money and credit handling, shoplifting prevention, premises maintenance, systems & staff management, inventory optimization and management, administration and supply chain management

Marketing & Promotion **9 Hours**

New marketing strategies – loyalty programs -sales promotion through advertising, public relations, direct marketing, personal selling, promotion mix; digital marketing, social media leverage – email & influencer marketing – future trends

Financial Planning & Project Management **9 Hours**

Formats in business ownership- registration & licensing- financial support from Government and institutions- Taxes - government incentives (financial &non financial) – Steps and formalities to start a boutique – evaluation and sickness prevention activities

Theory : 45 Hours **Total: 45 Hours**

REFERENCES

1. Stewart B., "Opening Boutique Guide", Bull City Publishing, 2016.
2. https://www.bizmove.com/starting-business/how-to-start-a-boutique-business.pdf
3. Wright C, "Business Boutique", Ramsey Press, Tennessee, 2017.
4. https://www.thebalancesmb.com/department-store-mission-statements-4068552
5. https://www.entrepreneur.com/article/38290
6. https://www.smartsheet.com/store-layout
7. https://www.smartsheet.com/retail-store-operations
8. https://www.shopkeep.com/blog/promotion-ideas-for-retail-stores

APPAREL TECHNOLOGY

Version 1 (17.8.17)

U17FTE0005 CLOTHING SCIENCE FOR APPAREL ENGINEERING

Course Outcomes

L	T	P	J	C
3	0	0	0	3

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

CO1	Acquire Knowledge on the basic requirements in the design of apparel engineering	K2
CO2	Recognize and associate the objective and subjective evaluation of clothing fit	K4
CO3	Recognize and associate the Effect of fiber properties, yarn structure and fabric construction on the fabric aesthetic & appearance	K4
CO4	Recognize and associate the Effect of fiber properties, yarn structure and fabric construction on the fabric dimensional stability.	K4
CO5	Acquire Knowledge and associate the Effect of fiber properties, yarn structure and fabric construction on the fabric Serviceability.	K4
CO6	Enhance knowledge and associate the effect of fiber properties, yarn structure and fabric construction on the fabric handle & clothing comfort	K4

Pre Requisite:

U17FTT1001 Fibre science
U17FTT2001 Yarn technology
U17FTT 3001 Weaving Technology
U17FTT5003 Knitting Technology
U17FTI 5202TextileandApparel Quality Evaluation

CO/PO Mapping

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

COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	S	S												
CO2	S	S												
CO3	S	S											S	
CO4	S	S											S	
CO5	S	S											S	
CO6	S	M											S	

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	1.Course Exit Survey

Course content

REQUIREMENTS FOR APPAREL ENGINEERING **5 Hours**

Introduction to apparel design & its types – aesthetic, functional, exploratory, incremental. Requirements for clothing design - physiological, biomechanical, ergonomic, psychological requirements. Process, steps involved in clothing design.

SIZING SYSTEMS AND EVALUATION OF CLOTHING FIT **10 Hours**

Development of sizing system. Principles of sizing system. Definition, Importance, Standards, influence of clothing fit. Testing methods - objective and subjective evaluation of fit.

AESTHETICS AND APPEARANCE **9 Hours**

Selection of fibre, yarn structure and fabric construction; their effect on pilling, fastness, lusture 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 **9 Hours**

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 **3 Hours**

Objective evaluation of fabric hand by KES and FAST.

CLOTHING COMFORT **9 Hours**

Effect of fibre properties, yarn structure, fabric design, fabric construction and treatments on the fabric properties such as 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 **Total: 45 Hours**

REFERENCES

1. Engineering Apparel Fabrics and Garments, Woodhead Publishing Textiles, by J Fan, L. Hunter, 2009
2. Saville B.P, “Physical Testing of Textiles”, The Textile Institute, Wood head Publishing Ltd, Cambridge, 1999
3. Fan J., Yu. W and Hunter L., Clothing Appearance and fit, Textile Institute, Woodhead Publishing Limited, 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,editedbyY. Li and X-Q. Dai, Woodhead Publishing Limited, England, 2006

7. Design of apparel fabrics: role of fibre, yarn and fabric parameters on its functional attributes, Journal of Textile Engineering, Vol.54, No.6, 179-190, 2008
8. Design and engineering of functional clothing, Indian Journal of fiber & Textile Journal, Vol.36, pp. 327-335, December 2011

U17FTE0006 APPAREL FINISHING AND CARE

L	T	P	J	C
3	0	0	0	3

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.	K2
CO2	Analyse and classify the different conditions and chemicals need for finishing of materials	K3
CO3	Acquire knowledge on Denim Finishes and advanced finishes.	K3
CO4	Discuss on un-conventional finishes and their applications	K2
CO5	Classify and apply skill to identify stains and removal technique in apparel.	K3
CO6	Acquire knowledge on sustainable and green finishing methods	K2

Pre Requisite :
U17FTI5201 Textile Chemical Processing

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

Cos	Programme Outcomes(POs)												PSOs	
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12	PSO 1	PSO 2
CO1	M		S			S						M	M	S
CO2	M	W	S			S						M	M	S
CO3		W	S			S						M	M	S
CO4			S			S	S					M	M	S
CO5		M	S	S		S						M	M	S
CO6						S	S	M			S	M	M	S

Course Assessment methods:

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	1. Course Exit Survey

Course Content

INTRODUCTION **6 Hours**

Reason for finishing, Classification of finishing, Mechanical and chemical finishing routes. Aesthetic finishes-Stiffening, Softening, Different types of Calendered effect, Brushing, Sueding, Burn out finishes

FUNCTIONALFINISHING **9 Hours**

Shrinkage control -Sanforizing, Compacting &Stentering, Water repellent/proof, flame retardant, heat resistant, mildew proof, moth proof,anti-static, soilrelease,UVprotection, anti microbialandelastomeric finish (without compaction). Resin finishing–durable press,wash-n-wear, wrinkle free

SPECIALFINISHES **9 Hours**

Denim processing-general method, Process conditions,machineries,chemicalsusedfor various special effects-stone wash, acid wash, enzyme wash, bio-polishing,sandblasting,ozoneandlaser fading, tinted denim, over dyed denim, reverse denim, pseudo denim,stretchdenim,peachskineffect, quick wash denim, vintage wash, enzyme- soda wash,dextrose-caustic wash, suedingwash, golf ball wash, tie'n' wash, marble wash and crush finish.

UNCONVENTIONAL FINISHING METHODS **9 Hours**

Plasmatreatment, finishing using micro capsules, nanoandelectro chemical treatment of textile materials, self cleaningandphase changing materials. Sustainable and green processing.

GARMENT FINISHING **3 Hours**

Garment Dyeing Machines for Finishing, Selection of sewing thread, accessories w.r.t garment dyeing and finishing. Preparation of fabrics for garment dyeing and finishing.

APPAREL CARE **9 Hours**

Types and characteristics of stains,Identificationofstains, selection of stain removers, Stain removal methods- Oil, colourmatter, Garment laundering equipmentsandprocedures,Useofcare labels and standards/norms for carelabels.

Evaluation and Standards for finished garments and accessories.

Theory : 45 Hours **Total: 45 Hours**

REFERENCES

1. NomeiaD,souza.,"FabricCare",NewAgeInternational(P)Ltd, Chennai,1998.
2. ShenaiVA,"TechnologyofTextileFinishing",SevakPublications,Mumbai,1995.
3. Dr.G.Nalankilli, Dr.S.Jayaprakasam, "Textile Finishing" SSMIIT Staff's and Student's Co-op society. 1997
4. "GarmentWetProcessingTechnicalManual",AATCC/SDC,1994.
   WhittallNS,"LaunderingandDryCleaning",vol.8,TextileProgress, 1996.
5. PradipVMehta,"AnIntroductiontoQualityControlfortheApparelIndustry",ASQCQuality Press,1992.
6. GoldmanRFandLyleDS,"PerformanceofTextiles"JohnWileyandSons,NewYork1987.
7. HallAJ,"TextileFinishing",ElsevierPublishingCo.Ltd,1986.
8. RichardAScott,"TextilesforProtection",TheTextileInstitute,WoodheadPublishingLimited, CRCPress. 2005.
9. W.D. SchiendlerandP.J. Hauser, "Chemical Finishing of Textiles", The Textile Institute, Wood Head, 2004.

U17FTE0007 **FUNCTIONAL CLOTHING**

L	T	P	J	C
3	0	0	0	3

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

CO1	Summarize the classification and design requirements of various classifications of functional clothing	K2
CO2	Choose the requirements of functional clothing as per the end use of the consumer	K3
CO3	Appraise technical specifications for functional clothes	K5
CO4	Choose suitable textile raw materials suitable for developing functional clothes	K6
CO5	Apply the knowledge on textiles processes in designing functional clothing	K3
CO6	Acquire knowledge on the evaluation methods and standards available to evaluate the various functional clothing	K2

Pre Requisite :
U17FTI4202 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 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PS O 1	PS O 2
CO 1		S	S			S							S	
CO 2	S	S											S	
CO 3	S	S	S									M	S	S
CO 4	S	S	S									M	S	S
CO 5				S			M						S	
CO 6			S	S								S	S	

Course Assessment methods:

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	1. Course Exit Survey

Course Content
INTRODUCTION **8 Hours**
Functional clothing - Classification, requirements, design and engineering- steps in designing,

pattern engineering, functional fit. Performance analysis of functional clothing.

MEDICALWEAR **7 Hours**

Classification of medical textiles and their functions– Textile materials used for implants and non-implants, extra corporeal devices, Healthcare and hygiene products. Therapeutic and bio sensing garments – Design and applications.

PROTECTIVE WEAR **9 Hours**

Materials used, requirements and functions of flame resistant protective clothing, chemical protective clothing, mechanical protectiveclothing– cut, slash, ballistic and blunt impact protection, electricalprotectiveclothingand radiation protection.

SPORTSWEAR **8 Hours**

Materials used, requirements and functions of sportswear in fatigue reducing, performance monitoring and enhancing- Materials used, requirements and functions of sports footwear - Design, fit, materials, components and their functions.

VANITY CLOTHING **4Hours**

Materials used, requirements and functions of vanity clothing- Body shaping, support and contouring for enhanced appearance

CLOTHING FOR PEOPLE WITH SPECIAL NEEDS **3Hours**

Materials used, requirements and functions of clothing for people with special needs- enabling clothing for elderly, infants and disabled.

CROSS FUNCTIONAL CLOTHING **6Hours**

Materials used, requirements and functions of cross functional clothing- Space suits, combat clothing and wearable electronics

Theory : 45 Hours **Total: 45 Hours**

REFERENCES

1. HorrocksA. R. andAnandS. C, "Handbook of Technical Textiles", The TextileInstitute,WoodheadPublications,Cambridge,UK,2000
2. AdanurS.,WellingtonSears"HandbookofIndustrialTextiles", Technomic PublishingCo.Lanchester,USA,1995
3. VigoT.L.,IntelligentFibres,JournalofTextileInstitute ,90,Part3,TextileInstitute, 1999
4. AnandS.,"MedicalTextiles",TextileInstitute,UK,1996
5. SanjayGupta,"SmartTextiles– TheirProductionandMarketingStrategies",BhumicaPrinters,NewDelhi,2000
6. Tao X., "Smart Fibres, Fabric and Clothing", Textile Institute, Woodhead PublishingLimited,Cambridge,2001

U17FTE0008 ERP AND MIS IN APPAREL INDUSTRY

L	T	P	J	C
3	0	0	0	3

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

CO1	Acquire knowledge on basics of ERP and MIS	K2
CO2	Acquire knowledge on the application and modules of ERP in apparel Industry.	K3
CO3	Acquire Application strategy of Information Systems in apparel industry	K4
CO4	Develop knowledge on internet and electronic commerce and their day to day importance	K3
CO5	Describing and developing knowledge on transforming Information systems to the business operations	K3
CO6	Developing skills on supporting technically on ERP system developers for apparel industries.	K4

Pre Requisite : NIL

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

COs	Programme Outcomes(POs)													
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12	PSO 1	PSO 2
CO 1	S				M				M				M	M
CO 2	S				M				M				M	M
CO 3	S				M					M				
CO 4		S			M				M	M			M	M
CO 5		S			M					M				
CO 6		S			M				M	M			M	M

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	1. Course Exit Survey

Course Content

INTRODUCTION **9 Hours**

An overview and features of ERP, MIS integration, ERPdrivers, Trends in ERP, ERP in India. ERP system perspective – Management Information System, Operations Support System,TransactionProcessingSystem,NetworkStructureofERPsystem,ERPworkflow,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**

Business modules in ERP packages, Finance, Production, Human Resource, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution, Resource Management, BusinessProcessReengineering,RelationshipbetweenERPandBPR,ERPImplementationLifecycle,Implementationmethodology,ERPProjectManagementandMonitoring.ERPandE-Commerce,ERPCulture,ERPandCRM,ERPandSCM, ERP selection issues, ERP in Public Sector Enterprises, Pre- and Post-implementation issues, ERP Vendors, Key ERP consultants in India, Future directions in ERP.

BASICSOFINFORMATIONSYSTEM **9 Hours**

Introduction to Information system in business, Need for Information Technology, System concept, Components of an information 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 of intranets, the role of Extranets, enterprise collaboration 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.

Theory: 45 Hours **Total: 45 Hours**

REFERENCES

1. V.K.Garg,VenkatandN.K.Krishna, “ERP Concepts and Practices”, 1st edition, PHI Publications, 1997.
2. James A.O’Brien, “Introduction to Information Systems”, Tata McGrawHill, New Delhi, 2005.
3. AlexisLeon,“ERPDemystified”,1stedition,Tata McGrawHill, New Delhi, 2000.
4. S.Sadagopan, “ERP: A Managerial Perspective”,1stedition,TataMcGraw Hill,NewDelhi,1999.
5. Langenalter,A.Gary,“Enterprise Resources Planning and Beyond”,1stedition, St.LuciePress, USA, 2000.
6. Diwan,Parag and Sharma, Sunil, “Enterprise Resource Planning: A Manager’s Guide”,1stedition,1999.
7. E.Turban, E.McLeanandJ.Wetherbe, “Information Technology for Management: Making Connections for Strategic Advantage”, John Wiley and Sons, New Jersey, 2001.
8. W.S.Jawadekar, “Management Information Systems”,TataMcGrawHill, New Delhi,2004.

APPAREL MANAGEMENT

Version 1 (17.8.17)

U17FTE0009 **FASHION MARKETING**

L	T	P	J	C
3	0	0	0	3

Course Outcomes

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

CO1	Acquaint with the fashion marketing process and develop a fashion market.	K3
CO2	Understand fashion consumer psychology and the influence on decision making.	K2
CO3	Appreciate the purpose of research in fashion marketing	K3
CO4	Understand fashion forecasting and practice the same for a specific season.	K6
CO5	Understand marketing strategies and distribution of fashion services through retailing.	K3
CO6	Acquaint with communication techniques in fashion marketing and planning the same.	K3

Pre Requisite :

U17FTE001 Apparel Product Development Process

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

COs	Programme Outcomes(POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		M	S					M					M	S
CO2						M							M	S
CO3		M											M	M
CO4					S				S				M	S
CO5								M	M				S	M
CO6										S	M		S	M

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	1. Course End Survey

Course Content

INTRODUCTION TO FASHION MARKETING 9 Hours

Definition of Fashion- Fashion marketing – Overview of Fashion Marketing Process - Development of Fashion market – Size, Structure – marketing environment - micro marketing, macro marketing environment – ethical issues in fashion marketing.

FASHIONCONSUMER AND FASHION MARKETINGRESEARCH 9 Hours

Need for study of fashion buyer – decision-making by fashion consumers, psychological processes, sociological aspects of consumer behavior – organizational buyer.

Purpose of marketing 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 9 Hours

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.Developing apparel designs and other specification for the upcoming season through fashion forecasting.

MARKETINGSTRATEGIES AND DISTRIBUTION OF FASHION SERVICES 9 Hours

Marketing Strategy - Role of price decisions – internal and external factors influencing price decisions – pricing strategies for new products.

Distribution of Fashion services – importance of fashion retailing, trends in retailing – the 'grey' market – effectiveness of retail marketing

FASHION MARKETING COMMUNICATIONS AND PLANNING 9 Hours

Fashion Marketing - advertising, Sales promotion, Public relations, celebrity endorsement and sponsorship, personal selling, visual merchandising, visual marketing, ethics in marketing communication.

Fashion Marketing Planning – objectives and planning process – marketing audits and SWOT analysis – implementation and organizational issues in fashion marketing plan.

Theory : 45 Hours Total: 45 Hours

REFERENCES

1. Mike Easey, "FashionMarketing",BlackwellScience,2000.
2. Malcolm Barnard "Fashion as communication", Routledge Taylor & Francis Group, 2002
3. MauriceJ .Johnson and Evelyn C.moore, "Apparel Product Development", Prentice HallInc.,2001.
4. Smith, P. R. and Taylor, J., "Marketing Communications: An Integrated Approach", KozanPage, 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."FashionMarketing-Contemporary Issues",CIM,2001
7. George Belch, Michael A Belch, "Advertising Promotion: An Integrated Marketing Communication Perspective", Tata McGraw Hill, 2001.
8. John M Penrose, Robert W Rasberry, Robert J. Myers, "Advanced Business Communication",SouthWesternPublicationCompany,2001

U17FTE0010 SOCIAL COMPLIANCEFOR APPARELINDUSTRY

L	T	P	J	C
3	0	0	0	3

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 normsonlabour and safety
CO3: Understand the compliance normsonHealthandEnvironment
CO4: Understand the normsonwagecompliance
CO5: Comprehend practice of ethical trading and international compliance
CO6: Identify and apply compliance norms for apparel industry
Pre-requisites: NIL

	CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak													
COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO1 1	PO 12	PS O1	PS O2
CO1					M									
CO2					M					M				
CO3					M					M				
CO4		S								M				
CO5		S								M		M	M	M
C06						S	S	S						S

Course Assessment methods:

Direct	Indirect
1.Internal tests(I, II,), 2.Assignment, 3.End Semester Exam	1. Course end Survey

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 child labour, Hazardous child labour, Environment and climate, health and safety–safety norms and measures to been forced for safe working Environment.,workinghours-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,collectivebargaining, corruption and bribery– effect and risk in the supplychain. Global Reporting Initiatives(GRI)sustainability reporting guide line. Organization for EconomicsCo-operation andDevelopment(OECD) guide lines for multi nationaldiscrimination.

WAGECOMPLIANCE: 9 Hours

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

ETHICAL TRADING AND INTERNATIONAL COMPLIANCE: 7 Hours

Ethical Trading Initiative (ETI). Basic code of labourpractice.WorldwideResponsibleApparel Production (WRAP)purposes, WRAP Principle,certification process, SA8000. National and international regulating organizations – OSHA, WRAP, GOTS, OEKO TEX. Corporate Social Responsibility (CSR) – mandatory requirements – benefits to company, labour and society.

Total: 45 Hours

REFERENCES

1 RajeshChhabara,"SocialAccountability",AvasoftechPvt.Ltd.,2005
2. RebocakLeifziger, "SA 8000: The first decade", GreechLeaf Publishers, May2009.
3.http://www.ilo.org.in.
4.http://www.endchildlabor.com
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.

U17FTE0011 GLOBAL MARKETING AND SOURCING STRATEGIES

L	T	P	J	C
3	0	0	0	3

Course Outcomes

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

CO1	Acquire knowledge on drivers and factors influencing global marketing	K3
CO2	Analyze the process of global market management	K4
CO3	Analyze the sourcing strategies**.**	K4
CO4	Evaluate the elements of sourcing design**.**	K5
CO5	Evaluate the trends in growth of global markets	K5
CO6	Understand the role of developed and under developed countries in world trade	K2

Pre Requisite : Nil

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

COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO12	PSO 1	PSO 2
CO1		S	S	S		S	S	S		S		M	S	S
CO2		S	S		S					S	M	M	S	
CO3		S		S	S		S	S		S	M	M	S	S
CO4		S			S		S				M		S	S
CO5		M		S	S	S						M	S	
CO6		M		S					M	M			S	

Course Assessment methods:

Direct	Indirect
5. Internal tests 6. Assignment 7. Group Presentation 8. End Semester Exam	2. Course Exit Survey

Course Content

GLOBAL MARKETING **9 Hours**

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.

GLOBAL MARKET MANAGEMENT **9 Hours**

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 **9 Hours**

Principles of sourcing strategy - out sourcing.Sourcing goals and objectives.Source selection - contracts and incentives, supplier strategies.Sourcing data and reports.

SOURCING DESIGN **9 Hours**

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 **9 Hours**

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 **Total: 45 Hours**

REFERENCES

1. Warren.J.Keegan, "Global Marketing Management", 7th Edition, Prentice Hall of India, New Delhi, 2008.

1. Johany. K.Johansson, "Global Marketing", Second Edition, Irwin McGraw Hill, 1995.
2. Subash C, Jain, "International Marketing", Sixth Asian books (P) Ltd, South Western Thomson learning, 1993.
3. Cateora, "Organisations Structures", Tenth Edition, McGraw Hill, 1997.
4. SudhiSheshadri "Sourcing Strategy", Principles, Policy and Design , Springer, 2005.

U17FTE0012 LOGISTICS AND SUPPLY CHAIN MANAGEMENT

L	T	P	J	C
3	0	0	0	3

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

CO1	Discuss the importance of logistics and supply chain management and its value for competitive advantage of the firm.	K2
CO2	Analyze and interpret the supply chain, the role of its actors and its logistics flows and function	K4
CO3	Apply the ability to developandmanageSupplyChain	K3
CO4	Assess logistics and supply chain management required by garment industry	K5
CO5	Understand the concept of distribution network planning	K2
CO6	Identify new emerging trends SCM and apply suitably in Apparel Industry	K3

Pre-Requisites:

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

COs	Programme Outcomes(POs)												PSOs	
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PS O1	PSO 2
CO1	M									M			M	
CO2	M	M								M	S		M	
CO3	M	S								M	S		M	
CO4	S													
CO5	M					M					M			
CO6					M	M	M		S		M	M		M

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation 4. End Semester Exam	1. Course Exit Survey

Course Content

OVERVIEW OF SCM AND LOGISTICS **9 Hours**

Definition of logistics and supply chain management, Evolution of logistics, logistics and competitive performance, physicaldistributionmanagement.Principlesofsupplychainmanagement– functions of supply chain management, Customer focus in supply chain management– customer service, Efficient Consumer Response(ECR).

DESIGNANDMANAGEMENTOFSUPPLYCHAIN **9 Hours**

Phases of supply chain management, in bound and out bound logistics–suppliers to manufacturers, manufacturers to consumers. Logistics management-design and management, integrated supply

chain,pullandpushstrategy. Demand management-demand forecasting and shaping.Bullwickeffect-Influencing factors, control measures.

GLOBALSUPPLYCHAINMANAGEMENT **9 Hours**

Organizing for global markets– World Class Supply Chain Management (WCSCM).Stages in global SCM. International logistics.WorldclassLogisticsManagement(WCLM)

ITENABLEDSUPPLYCHAINMANAGEMENT **9 Hours**

Information technology in the integrated supply chain, importance, information requirements and applications. Intelligence information system – material resource planning, manufacturing resource planning,enterpriseresourceplanning. ITpack-ages–SAPR/3ERP, BAANERP solutions, i2Rhythm, selection of suitable package.

Cost and Performance Measurement InSupplyChain 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 **9 Hours**

Transportation mix–ware housing, transportation cost, transportation decision and futuristic direction in trans-portation. Location strategy–plant location, distribution problem, warehouse location, retail facility location.

EMERGINGTRENDSINSUPPLYCHAINMANAGEMENT: Collaboration strategies,VendorManagedInventory(VMI), third and fourth party logistics, green supply chain,reverselogistics..

Theory : 45 Hours **Total: 45 Hours**

REFERENCES

1. Douglas M. Lamber ,James R.Stock and Lisa. M. Ellram, "Fundamentals of LogisticsManagement",ColumbiaBoblinMediaCorp.,1998.
2. Donald J.Bowersox and DavisJ.Closs, "Logistics Management – The IntegratedSupplyChainProcess",ColumbiaBoblinMediaCorp.,2006.
3. Sunil Chopra and Peter Meindal, "Supply Chain Management: Strategy,PlanningandOperations",PrenticeHallInc.,2001.
4. Benjamin S. Blanchard, "Logistics Engineering and Management",Mc Graw Hill,Inc.New York, 2002.
5. MartinChristopher,"Chap.7ofLogisticsandSupplyChain Management– Strategies for reducing cost and improving service", Second Edition. McGraw Hill.Inc.,NewYork1992.

ONE CREDIT COURSES

Version 1 (17.8.17)

U17FTC0001 COMPUTER AIDED TEXTILE AND APPAREL DESIGNING

Course Outcomes

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

CO1	Practice creativity and innovation	K6
CO2	Develop designs as per market needs and current trends	K6
CO3	Develop catalogues to market the developed products	K6

Pre Requisite : Nil

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak														
COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
CO1			S											
CO2			S							S			S	
CO3		S	S		S					S			S	

Course Assessment methods:

Direct	Indirect
1. Internal test	Course exit survey

EXPERIMENTS:

1.	Design mood boards and color boards for specific markets based on fashion forecasts
2.	Develop print fabric simulations
3.	Develop woven fabric simulations
4.	Develop knitted fabric simulations
5.	Develop surface ornamentation simulations
6.	Develop a collection of garments
7.	Develop an E-catalogue of the collections.

Total: 15 Hours

REFERENCES

1. Fashion Designing Laboratory – I Lab Manual
2. Fashion Designing Laboratory – II Lab Manual
3. Lectra Manual

U17FTC0002 **DRAPING TECHNIQUES**

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

CO1	Appraise and select suitable fabric for the required design aspects	K4
CO2	Evaluate and select suitable fabric for the required silhouettes	K4
CO3	Explore the different draping techniques for the development of skirts and blouses	K5
CO4	Develop skills in different draping techniques for the development of bifurcated garments	K5
CO5	Create methods for the development of new designs for advanced draping	K6
CO6	Design and develop three dimensional garments by draping techniques for designers and industry	K6

Pre Requisite : Nil

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak														
COs	Programme Outcomes(POs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		S	S	M		M				M			S	M
CO2		S	S	M		M				M			S	M
CO3		S	S		M			M	S				S	
CO4		S	S		M			M	S				S	
CO5		S	S	M					S	S	S	S	S	M
CO6		S	S	M					S	S	S	S	S	W

Course Assessment methods:

Direct	Indirect
1. Internal test	Course exit survey

EXPERIMENTS

1.	**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, and
7.	Advanced Draping: Gowns -Shift & Empire

Practical : 15 Hours **Total: 15 Hours**

REFERENCES

1. Aldrich W., Fabric, Form and Flat Pattern Cutting, Blackwell Science Limited, London, 1996.
2. Crawford A.A., The Art of Fashion Draping, Om Books International, New Delhi, 2005.
3. Kiisel K., Draping -the complete Course, Laurence King Publishers, 2013

U17FTC0003 SEWING MACHINERY DYNAMICS

Course Outcomes

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

CO1	Recall various process parameters in garment sewing	K1
CO2	Apply knowledge to determine the impact of process parameters on garment sewing	K3
CO3	Acquire knowledge on sewing dynamics	K1
CO4	Acquire knowledge in measurement of needle heat	K1
CO5	Analyze the impact of needle heating on sewing performance	K4
CO6	Acquire knowledge on measuring sewing machine forces	K1

Pre Requisite: Nil

CO/PO Mapping

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

COs	Programme Outcomes(POs)												**PSOs**	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	S													
CO2		S											S	
CO3			S											
CO4														
CO5													S	
CO6														

Course Assessment methods:

Direct	Indirect
1. Internal test	Course exit survey

PROCESS PARAMETERS IN GARMENT SEWING 7 Hours

The impact of operation type and technological equipment on process parameters of garment sewing- determining total time on the basis of process parameter measuring- determining total time using video cameras- measuring system and equipment

SEWING DYNAMICS 8 Hours

Influence of machine and material parameters on the stitch length - effect of thread structure on tension peaks during lock stitch sewing- needle penetration force – impact of needle heat on sewing performance. Measurement of needle heat- Measuring sewing machine forces at high speeds

Total: 15 hours

REFERENCES

1. HaroldCarrandBarbaraLatham,“TheTechnologyofClothingManufacture”,OmBookService,2002.
2. ShaefferClaire,“SewingfortheApparelIndustry”,PrenticeHall,NewJersey, 2001.
3. Singer,“SewingLingerie”,CyDeCosseIncorporated,1991.
4. Laing R.M. and Webster J, “Stitches and Seams”, The Textile Institute,Manchester, 1999
5. Technical Advisory Committee of AAMA, “ ANew Look at Apparel Mechanization”,1978.
6. JacobSolinger,“ApparelProductionHandbook”,ReinholdPublications,1998

U17FTC0004 DEVELOPMENTS IN SEWING MACHINERY

Course Outcomes

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

CO1	Acquire knowledge in developments in basic sewing machines	K1
CO2	Discuss the developments in sewing machine work aids and attachments	K2
CO3	List different types of special sewing machines required for making different garments	K1
CO4	Acquire knowledge in advancements in sewing machines used for knitted garments	K1
CO5	Acquire knowledge in advancements in sewing machines used for woven garments	K1
CO6	Describe the developments in CNC sewing machines	K2

Pre Requisite:Nil

CO/PO Mapping

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

COs	Programme Outcomes(POs)												PEOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PEO1	PEO2
CO1	S													
CO2	S													
CO3		S												
CO4				S										
CO5				S										
CO6					S									

Course Assessment methods:

Direct	Indirect
1. Internal test	Course exit survey

BASIC SEWING MACHINES: **5 Hours**

Developments in basic sewing machines- single needle lock stitch machine – bobbin winding- work aids and attachments- automatic trimming

SPECIAL SEWING MACHINES: **10 Hours**

Developments in special sewing machines – over lock machine- flat lock machine – feed off the arm- button sewing machine, button hole making machine, bar tack machine, safety stitching, blind stitching, double needle , zigzag machines, CNC sewing machines.

Theory : 15 Hours **Total: 15 Hours**

REFERENCES

1. HaroldCarrandBarbaraLatham,"TheTechnologyofClothingManufacture",OmBookService,2002.
2. ShaefferClaire,"SewingfortheApparelIndustry",PrenticeHall,NewJersey, 2001.
3. Singer,"SewingLingerie",CyDeCosseIncorporated,1991.
4. Laing R.M. and Webster J, "Stitches and Seams", The Textile Institute,Manchester, 1999
5. Technical Advisory Committee of AAMA, " ANew Look at Apparel Mechanization",1978.
6. JacobSolinger,"ApparelProductionHandbook",ReinholdPublications,1998.

U17FTC0005 NEW TRENDS IN PRINTING

Course Outcomes

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

CO1	Acquire knowledge on new printing techniques	K1
CO2	Acquire knowledge ondifferent printing substrate and materials used commercially	K1
CO3	Acquire knowledge on carpet and home textile printing techniques	K1
CO4	Ability to explain various printing methods, machines and styles for fabric and garment	K2
CO5	Create innovations in the field of printing	K6

Pre Requisite : Nil

		CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs			Programme Outcomes(POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1		S												
CO2		M			S								S	
CO3		M			S									
CO4		M		S										
CO5			S		S									S

Course Assessment methods:

Direct	Indirect
1. Internal test	Course exit survey

DIGITAL PRINTING **3 Hours**

Different types, Substrate preparation, Ink Formulation, Digital colour management, Industrial production printers.

TRENDS IN PRINTING **9 Hours**

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

NEW TRENDS **3 Hours**

Trends in Garment printing, Carpet and Home textile printing

Total: 15 Hours

REFERENCES

1. Edited by H.Ujiie “Digital printing of Textiles”, Wood head Publishing Limited 2006

2. L.W.C.Miles “Textile Printing”Society of Dyers & Colorists; 2nd revised edition, January 2003

3. R. S. Prayag, Technology Textile Printing – Noyes Data Corporation, 1989

U17FTC0006 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	K2
CO2	Apply modern industrial engineering methods and scientific solutions to apparel manufacturing t o w a r d s economic,environmental,andsocietalcontext	K3
CO3	Practice work measurement, work place engineering and lean manufacturing in the apparel manufacturing industry	K3

Pre Requisite:Nil

		CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak												
COs			Programme Outcomes(POs)											
	PO 1	PO2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2
CO1	S			S	S									
CO2					S	S	S						S	M
CO3			S				M				M		S	

Course Assessment methods:

Direct	Indirect
1. Internal test	Course exit 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 - M/C 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,

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 Limited 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. Hobbs (Dennis P) LEAN Manufacturing Implementation: A Complete Execution Manual for any Size Manufacturer , Cengage Learning India Private Ltd, NewDelhi

U17FTC0007 APPLICATION OF SIX SIGMA IN APPAREL MANUFACTURE

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

CO1	Apply the concept of Six Sigma and its application to evaluate and control a process	K3
CO2	Analyze various metrics used in designing, implementing and evaluating Six Sigma process	K4
CO3	Assess implementation of six sigma concept in apparel industry	K5

Pre Requisite : Nil

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak														
COs	Programme Outcomes(POs)													
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12	PSO 1	PSO 2
CO 1	S		M	M	M				M	M			M	
CO 2	S	S	M	M	M				M	M	M		M	
CO 3			M		M				M	M	M		M	M

Course Assessment methods:

Direct	Indirect
1. Internal test	Course exit 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, Throughput Yield, Rolled Throughput Yield, Normalized Yield Process Capability Indices: Cp, Cpk, Cpm, Cpkm. Dealing with non-normality through transformations.

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; Antis, 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.

U17FTC0008 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	K2
CO2	Apply concept of Lean Wastes and understand its impact on cost of poor quality in the context of apparel manufacturing industry	K4
CO3	Apply the Value Stream Mapping tool in elimination of Lean Wastes	K4

Pre-requisite: Nil

CO/PO Mapping

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

COs	Programme Outcomes(POs)													
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12	PSO 1	PSO 2
CO 1						M	M			M			M	
CO 2		M				M	M			M			S	
CO 3		M			M	M	M			M	M	M	S	M

Course Assessment methods:

Direct	Indirect
1. Internal test	Course exit survey

INTRODUCTION **3 Hours**

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 Hours**

8 Wastages - over production, higher inventory, waiting time, unnecessary conveyance and motion of materials, over processing, rework- repairs - 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, Seisō, 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)

Total: 15 Hours

REFERENCES

1. 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, NewDelhi, 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.
Rajmanohar T P, “Cost of Poor Quality: Concept and Applications”, ICFAI Press, 2008.

U17FTC0009 CERTIFICATION PROCEDURES FOR PRODUCT AND PROCESS IN APPAREL INDUSTRY

Course Outcomes

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

CO1	Understand the different requirements of various product certification processes in Apparel Industry.	K2
CO2	Understand the different requirements of various process certification processes in Apparel Industry.	K2
CO3	Apply and follow certification procedures for health, safety and environment protection.	K3

Pre-Requisites:NIL

CO/PO Mapping (S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak														
COs	Programme Outcomes(POs)													
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO11	PO12	PSO 1	PSO 2
CO1					M								S	
CO2		S			M					M			S	
CO3				S	M			S		M	S	M		S

Course Assessment methods

Direct	Indirect
1. Internal tests	1. Course Exit 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.

PRODUCT CERTIFICATION: 8 Hours

ECO-Labeling - Oeko-Tex 100, EU Eco-Label for Textiles. Care Labelling - Sun protective labelling - Fibre content labeling - Country of origin labeling - Product Safety Standards (Children's Nightwear and Limited Daywear Having Reduced Fire Hazard) Regulations, Accessories on infants apparel.

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, Shipment certification.

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

U17FTC0010 STATISTICAL ANALYSIS IN THE APPAREL INDUSTRY

Course Outcomes

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

CO1	Develop knowledge on basic principles of statistical design of experiments	K4
CO2	Apply knowledge in collecting experimental data and entry of data in software according to given procedure	K3
CO3	Experiment the datas using the appropriate statistical tool and develop relevant models for analysis and interpretation	K4

Pre Requisite : Nil

CO/PO Mapping

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

COs	Programme Outcomes(POs)												PSOs	
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	S			S										
CO2				S						S			S	
CO3		S		S	S								S	

Course Assessment methods:

Direct	Indirect
1. Internal tests	1. Course Exit 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

Total: 15 Hours

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

U17FTC0011 COMPUTER COLOUR MATCHING AND PRINTING

Course Outcomes

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

CO 1	Develop a Colour Recipe For Printing Of Textiles design sketch and other components according to seasonal collection	**K6**
CO 2	Develop Quality Control Standards of Colouring Of Textile	**K6**

Pre Requisite: Nil

CO/PO Mapping

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

CO	**Programme Outcomes (PO's)**													
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO1 0**	**PO1 1**	**PO1 2**	**PSO 1**	**PSO 2**
CO 1		**S**	**S**		**S**			**S**		**S**				
CO 2					**S**					**S**				

Course Assessment methods:

DIRECT	INDIRECT
Internal test	Course exit survey

EXPERIMENTS:

1.	Introduction to SDC and its contribution to the field of colour.
2.	Concepts of colour
3.	Colour and emotions
4.	Colour and psychology
5	colour forcasting and colour standards
6	Human vision and Colour Perception

	Model
7	Standardization of the perception Mode
8	Factors affecting colour perception
9	Colour Matching and precautions while using light box.
10	Digital Colour Measurement and advantages
11	Different parts of a computer colour matching
12	Defining the CIELAB co-ordinates
13	Quality control and recipe prediction.

Total: 15 Hours

REFERENCES

1. Diane.T and Cassidy. T, "Colour forecasting" Blackwell Publishing, 2005
2. Understanding Computer Color Matching, by N. S. Gangakhedkar, Rutu Prakashan, Bombay, softbound, 176 pp

3. Total Colour Management in Textiles (Woodhead Publishing Series in Textiles) Kindle Edition by John H Xin, ISBN 978-1-85573-923-9, 2006, 234pp

U17FTC0012 FASHION ILLUSTRATION, MARVELOUS DESIGNER AND FASHION DRAPING

Course Outcomes
After successful completion of this course,the studentsshould be able to

CO 1	Design development with latest updation in the technology of fashion design & fashion draping and their different methods.	**K6**
CO 2	Involve various techniques in design domain with new software and its tools in CAD.	**K6**

PreRequisite:Nil

CO/POMapping (S/M/Windicatesstrengthofcorrelation)S-Strong,M-Medium,W-Weak													
CO	**ProgrammeOutcomes(PO's)**												
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PO11**	**PO12**	**PSO 1**	**PSO 2**
CO1		**S**	**S**		**S**			**S**		**S**				
CO2			**S**		**S**			**S**		**S**		**S**		

Course Assessment methods:

DIRECT	INDIRECT
Internaltest	Courseexit survey

EXPERIMENTS:

1.	Based on the theme/concept, fashion illustration/ design and fashion draping were created for the specific targeted customer.
2.	Develop fashion design simulations.
3.	Develop fashion accessories simulations.
4.	Develop men's wear simulations.
5	Develop women's wear simulations.
6.	Develop a collection of garments for the different age category peoples.

Total:15Hours

REFERENCES

1. Fashion and Textile Design with Photoshop and Illustrator – Professional Creative practice, RobertHume,Bloomsbury, 2016.
2. AdobeIllustratorforfashiondesign,2nd Edition,SusanMLazear,PearsonPublications.2012.
3. Fashion designer's handbook for Adobe Illustrator, 2nd edition, Marianne Centner, Frances Vereker,John Wileyand Sons,2011.

U17FTC0013 COSTING PROCEDURE FOR GARMENTS

Course Outcomes

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

CO 1	Gain knowledge on different methods and procedure for garment costing	**K2**
CO 2	Estimate costing of men's, women's and children's garments and its components	**K4**

Pre Requisite: Nil

CO/PO Mapping **(S/M/W indicates strength of correlation) S-Strong, M-Medium, W-Weak**													
CO	**Programme Outcomes (PO's)**												
	PO 1	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO 1	s	s										s	s	
CO 2	S	s										s	s	

Course Assessment methods:

DIRECT	INDIRECT
Assessment test	Course end survey

Introduction to Apparel Costing, Types of Garment sectors (Woven & Knits). Methods of Costing in Garment Sector, CMTP Cost Calculation, Order size. Fabric Consumption of Woven & Knits, Different types of Marker methods used & comparison. Yarn, knitting, weaving, dyeing, CMT, Trims, Accessories costing, BOM.

Costing for Men's wear – Shirt, T shirt, Trousers, Briefs, Vests. Costing for Women's wear – Tops, Leggings, T shirt, Camisole, panty, Costing for Children wear-Fabric consumption calculations, Various Process & Material costing, Others-Testing cost, Transport cost, Container CBM, L/c handling and other costs

Total: 15 Hours

REFERENCES

1. https://core.ac.uk/download/pdf/235049898.pdf
2. https://content.inflibnet.ac.in/data-server/eacharya-documents/56b0853a8ae36ca7bfe81449_INFIEP_79/52/ET/79-52-ET-V1-S1__unit_6.pdf
3. https://textilelearner.net/garment-costing-tips-and-techniques/

OPEN ELECTIVE COURSES

Version 1 (17.8.17)

U17FTO0001 FASHION PHOTOGRAPHY

L	T	P	C
3	0	0	3

Course Outcomes

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

CO1	Summarize knowledge on types of camera, working principles of camera and their various accessories.	K2
CO2	Apply basic techniques, equipment techniques, and subject techniques of various camera in photography	K3
CO3	Identify the importance of lighting, types of lighting, film types, film speed, and film format.	K4
CO4	Summarize skills on fashion photography in different fields	K6
CO5	Apply knowledge on developing and printing, image mixing and printing.	K3
CO6	Explain the applications of computer in photography and video photography	K3

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation	1. Course Exit Survey

Course Content

INTRODUCTION: 9 Hours

Camera types–35mm, SLR, Digitalcamera. Working principleofcamera.Accessories:generalaccessories-lenses,lensfilters, filmtypes,flashlights-lightingaccessories - poweraccessories,systemaccessories.Careandmaintenance ofcamera.

TECHNIQUES: 12 Hours

Cameratechniques:Basictechniques– fundamentalsofcomposition,depthoffield,shutterspeed, focusing,usingexposures.Equipment techniques – filter techniques, lens techniques, flashtechniques, studio flash techniques, lightingtechniques**.**Subject techniques – landscape,night photography, portrait, action photography and special effects. OutdoorandIndoorPhotography–equipments.

LIGHTING AND FILM: 9 Hours

Lighting– concept and importance– Types oflighting – frontlight,sidelight,backlight,revealinglight,controlling light, flashandstudiolighting.Filmtypes– BlackandWhite, Colour.Filmspeed-Film format.

SUBJECT PHOTOGRAPHY: 6 Hours

Fashion Photography in different media– modeling,newspaper,magazinesandfashionshows. Concept/theme based photography along with its application and acceptability in marketing and commercialization/branding.

DEVELOPING AND PRINTING: 9 Hours

Basics of developing and printing – imagemixingandprinting – Latest developments in printing –Computer applicationinphotography.Video photography

Theory: 45 Hours **Total: 45 Hours**

REFERENCES

1. Nirmal Pasricha, “A Professional’s Basic Photography”, Black RosePublications,Delhi,2002.
2. DanielLezano,“ThePhotographyBible”,ADavidandCharlesBook.,UnitedKingdom,2004.
3. SimonJoinson,“GetthemostfromyourDigitalCamera”,ADavidandCharlesBook.,UnitedKingdom,2004 .
4. Miller, W.R. “Basic Industrial Arts, Plastics, Graphic Arts, Photography”,McKnight Publishing company,Illinois,1978.
5. JohnHedge,“PhotographyCourse”,JohnHedgeCo,1992.
6. SteveBavister,“35mmPhotography-TheCompleteGuide”,ADavid andCharlesBook.,United Kingdom,2004.
7. PeterCattrell,“Photography”,OctopusPublishingGroupLtd,London 2005.
8. Sue Hillyard,“ThePhotography Handbook - A Step byStepGuide”, NewHollandPublishers, London,2003.

U17FTO0002 TEXTILE ARTS AND CRAFTS

L	T	P	C
3	0	0	3

Course Outcomes

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

CO1	Summarize knowledge on design concepts and colour categories.	K2
CO2	Apply basic techniques in design development	K3
CO3	Summarize skills on printing and painting techniques	K4
CO4	Summarize the knowledge on embroidery	K4
CO5	Apply knowledge on developing and printing, image mixing and printing.	K3
CO6	Explain the designing process in product development	K3

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation	2.Course Exit Survey

Course Content

Design concepts **10 Hours**

Design: structural, decorative and functional; Types- natural, stylized, geometric, historic, abstract design; Elements of Design; Principles of design, Application of elements and principles of design. Colour: Dimensions of colour, colour categories, and psychology, colour theories- Prang colour system and colour harmonies.

Design development **15 Hours**

Introduction & Overview of the traditional designs of India. Techniques: block printing, stencilling, screen printing, tie and dye, batik , Kalamkari, Painting.
Embroidery: Basic hand stitches, composite stitches, traditional Indian embroidery.

Product development **20 Hours**

Designing Process:Forecasting, Design process – Innovation of practice, analyzing the brief, Research Inspiration – Research direction, prototyping.
Development process: planning a collection, designer boards and portfolio presentation for a product

Theory: 45 Hours **Total: 45 Hours**

REFERENCES

1. Kathryn McCelvey and Janine Munslow, ―Fashion Design: Process, Innovation and Practice‖, Blackwell Publishing, USA, 2005.

2. HatanakaKokyo Collection –—Textile arts of India, Chronide Books, 1996
3. Elaine Stone, Jean A. Samples, — Fashion Merchandising, McGraw-Hill Book Company 1985.
4. RusselGillow and Nicholas Barnard, —Traditional Indian Textiles, Thames and Hudson Ltd., London, 1991.
5. ParulBhatnagar, —Traditional Indian Costumes and Textiles, Abhishek Publications, Chandigarh, 2004.
6. Jay Diamond and Ellen Diamond, —Fashion, Apparel, Accessories, Home Furnishings‖ Pearson Prentice Hall, New Jersey, 2007.
7. UshaSrikant, —Designs for a lifetime, Samata Enterprises, Mumbai, 2002.

U17FTO0003 HOME FURNISHING AND DECORATION FOR BEGINNERS

L	T	P	C
3	0	0	3

Course Outcomes

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

CO1	Generalize knowledge about the varieties of home furnishing materials and finishing methods	K3
CO2	Developing skills in the selection of different varieties of home furnishing materials in terms of sizes, shapes and patterns and construction methods	K4
CO3	Analyze the knowledge on suitability of furnishings and coverings for living room.	K4
CO4	Analyze the knowledge on suitability of various types of linens and its end uses	K4
CO5	Analyze the knowledge on suitable care & maintenance of home furnishing materials.	K4
CO6	Assess the varieties of home furnishing products and its end uses	K4

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation	3.Course Exit Survey

Course Content

Introduction **15 Hours**

Introduction of home decoration -types of home decoration, types of furniture and furnishing materials used in home. Window treatments - Doors and Windows – types. Window Treatment –. Curtains and Draperies

Floor covering and wall coverings **10 Hours**

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

Bed and bath linen **20 Hours**

Bed linens – types – Bed linens – types – bed sheets, blankets, comforters, , bed spreads, mattress and pads, pillows and pillow covers. Care and Maintenance of bed linen.
Kitchen linens – types - dish cloth, towels, fridge cover, grinder cover

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

Theory: 45 Hours **Total: 45 Hours**

REFERENCES

1. Hamlym, “Bed and Table linen”, Octopus Publishing Group Ltd, Newyork 2001.
2. David Holloway, “The Essential Book of Home Improvement Techniques”, Marshals Publications, London, 2000.
3. Emma Callery, “The Home Decorator’s Colour Source Book”, Apple Press Ltd, London, 2006.
4. Heather Luke, “Design and Make Cushions”, Silverdale Books Ltd, Leicester, 2001.
5. Hamlym, “Curtains and Blinds”, Octopus Publishing Group Ltd, Newyork, 2001.
6. Susie Johns, “A Cornucopia of Cushions”, Apple Press Ltd, London, 1997.
7. James Merrell, “Living with Decorative Textiles, “Thames and Hudson ltd, London, 1995.
8. Caroline Lebea, “Fabrics the Decorative Art of Textiles”, Thames and Hudson Ltd, London,1994

U17FTO0004 CREATIVE ARTS AND CRAFTS

L	T	P	C
3	0	0	3

Course Outcomes

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

CO1	Explain types of shapes and its application in designing	K2
CO2	Apply basic techniques in sketching in design development	K3
CO3	Summarize skills on shaping and painting techniques	K4
CO4	Explain the basics in sculpturing and colour application	K4
CO5	Apply knowledge on developing and printing, image mixing and printing.	K3
CO6	Explain the techniques in glass painting and flower making	K3

Course Assessment methods

Direct	Indirect
1. Internal tests 2. Assignment 3. Group Presentation	4. Course Exit Survey

Shapes **10 Hours**

Types of shapes and model on clay embossing champagne grapes. Basic shapes- Drawing-Shaping-Sculpturing-Designing-Painting.

Sketching and colouring **15 Hours**

Model on foil work girl. Model on multi colour flower mirror frame. Outlining small figures-Sketching-Background preparation-Sheet filling.

Preparation for model cutting-Colouring-Shaping-Sculpturing-Painting.

Model on plaster of paris Lord ganesh. Base mixing-Fixing-Colour applying-Color mixing-Painting.

Dotting and Finishing **20 Hours**

Model on warli tribal art. Model on tanjore glass painting. Base work-Drawing-Shaping-Sculpturing-Colour applying-Painting.

Dotting-Color mixing-Applying(dotting surface)-Skin tone-Background-Finishing.

Model on glass bottle art-2 techniques. Basic techniques-Background texture-Mixing-Drawing-Painting. Black matt finish-Clay modelling-Flower making-Painting.

Theory: 45 Hours **Total: 45 Hours**

REFERENCES

1. HatanakaKokyo Collection ––Textile arts of India, Chronide Books, 1996
2. RusselGillow and Nicholas Barnard, —Traditional Indian Textiles, Thames and Hudson Ltd., London, 1991.
3. ParulBhatnagar, —Traditional Indian Costumes and Textiles, Abhishek Publications, Chandigarh, 2004.

4. Jay Diamond and Ellen Diamond, —Fashion, Apparel, Accessories, Home Furnishings‖ Pearson Prentice Hall, New Jersey, 2007.
5. UshaSrikant, —Designs for a lifetime, Samata Enterprises, Mumbai, 2002.