ANNA UNIVERSITY, CHENNAI

NON-AUTONOMOUS COLLEGES AFFILIATED COLLEGES

REGULATIONS 2021

CHOICE BASED CREDIT SYSTEM (CBCS)

B. TECH. FASHION TECHNOLOGY

PROGRAM EDUCATIONAL OBJECTIVES:

Bachelor of Fashion Technology curriculum is designed to prepare the undergraduates to

1. Have **attitude and knowledge** for the successful **professional and technical career**
2. Have strong foundation in basic **sciences, engineering, management, mathematics and computational platforms**
3. Have **knowledge** on the **theory and practices** in the field of textile based garment manufacturing technology, fashion industry and allied areas
4. Engross in **life-long learning** to keep themselves abreast of new developments, and practice and inspire high **ethical values** and **technical standards**

PROGRAM OUTCOMES:

The Fashion Technology Graduates will have the ability to

1. Apply knowledge of **mathematics, sciences, engineering, textile and fashion technology** to get **solution** for the **technological problems** in fashion and garment industry
2. Identify, formulate, review literature and **critically analyze the technological problems** in the textile and fashion industry to reach **substantiated conclusion**
3. **Design and develop the solutions** to the **technological and managerial problems** in fashion and garment industry with appropriate consideration for the **public health and safety, and the cultural, societal, and environmental considerations**
4. 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 to the technological prob**lems in fashion and textile based garment industry

5. **Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools** for managing garment manufacturing companies with an understanding of the limitations
6. Apply reasoning gained through the contextual knowledge to assess **societal, health, safety, legal and cultural issues and the consequent responsibilities** relevant to the profession
7. Understand the impact of the developed solutions in societal and environmental contexts, and demonstrate the knowledge for **sustainable development**
8. Understand **ethical and professional responsibilities**
9. Function effectively as **an individual, and as a member or leader in diverse teams** in the profession
10. **Communicate effectively** on complex engineering activities with the engineering community and with society at large. Able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. 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. 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.

PROGRAM SPECIFIC OUTCOMES:

The Fashion Technology Graduates will have the ability to

1. Understand and **apply fundamental and the technical knowledge** for managing textile based garment and fashion industries.
2. Be a **successful entrepreneur** and execute fashion business in the levels of garment design, development and manufacture.
3. **Design and develop novel products and manufacturing processes** in fashion and Garment fields.

PEO's – PO's & PSO's MAPPING

PEO	PO												PSO		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
I	3	3	3	1	2	2	2	3	2	3	2	1	3	3	2
II	3	3	3	3	1	1	2	1	1	2	2	1	2	2	1
III	3	3	3	2	2	1	2	2	2	2	1	1	3	3	2
IV	1	2	1	1	1	2	2	3	1	1	1	3	2	2	2

Year	Semester	Course Name	PO												PSO		
		HUMANITIES AND SOCIAL SCIENCES INCLUDING MANAGEMENT COURSES	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
	I	English for Engineering and Technology - I															
	II	English for Engineering and Technology - II															
	VII	Ethics and Human values															
	VII	Management Elective															
		Basic Science Courses [BSC]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
	I	Mathematics – I															
	I	Engineering Physics															
	I	Chemistry															
	I	Physics and Chemistry Laboratory															
	II	Mathematics – II															
	II	Physics for Fashion Technologists															
	II	Chemistry for Textile Technologists															
	III	Probability and Statistical Methods															
	IV	Environmental Science and Sustainability															
		ENGINEERING SCIENCE COURSE [ESC]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
	I	Programming															

	I	Engineering Graphics															
	I	Programming Laboratory															
	II	Basics of Electrical and Electronics Engineering															
	II	Engineering Practices Laboratory															
	II	Electrical & Electronics Engineering Laboratory															
		PROFESSIONAL CORE COURSES [PCC]	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
	II	Fiber science															
	III	Characteristics of Textile Fibres	3	3	3	3	2	-	-	-	-	-	-	2	3	1	2
	III	Technology of Spinning processes	3	3	3	3	2	2	2	2	3	2	2	3	1	1	3
	III	Fabric Manufacturing	3	2	2	1	2	-	-	-	-	1	2	2	3	-	2
	III	Fabric Structures	3	2	2	1	2	-	-	-	-	1	2	2	3	-	2
	III	Concepts and Evolution of Fashion and Design	1	1	3	3	2	-	-	-	-	-	-	2	3	1	2
	III	Fabric Structure Laboratory															
	III	Fashion Illustration Laboratory	1	1	1	2	3	-	2	-	-	3	1	2	3	3	3
	IV	Apparel Production Machinery	1	3	3	2	2	1	-	-	-	-	-	3	3	3	3
	IV	Fabric and Garment Quality Evaluation	3	3	1	2	1	2	1	3	1	1	2	2	1	1	2
	IV	Fundamentals of Garment Manufacturing															
	IV	Pattern Engineering	2	2	2	2	3	-	-	-	1	-	-	-	2	-	2
	IV	Textile Chemical Processing	3	3	2	2	-	-	-	-	3	-	-	2	2	1	2

	IV	Computer Aided Fashion Designing Laboratory	1	1	1	1	3	-	-	-	2	2	2	3	3	2	3
	IV	Basics of Pattern Engineering and Garment Construction Laboratory	3	2	3	2	2	-	-	-	2	-	2	3	3	3	3
	IV	Textile Chemical Processing Lab	2	1	1	2	3	-	-	-	3	-	-	-	2	1	1
	V	Garment Construction	1	3	3	2	2	1	-	-	-	-	-	3	3	3	3
	V	Apparel Production Planning and Process Control	1	3	3	2	2	1	-	-	-	-	-	3	3	3	3
	V	Garment Construction Laboratory – I	3	2	3	2	2	-	-	-	2	-	2	3	3	3	3
	V	Computer Aided Garment Designing Laboratory	3	2	-	2	3	-	-	-	2	1	1	3	2	2	3
	VI	Apparel Marketing and Merchandising	3	2	2	2	1	2	-	-	-	-	-	-	2	3	-
	VI	Industrial Engineering in Garment Manufacturing	2.2	2.4	2.8	2.8	2.8	1.6	1.6	1.8	1.6	1	-	-	3	2	2.8
	VI	Garment Construction Laboratory – II	3	2	3	2	2	-	-	-	2	-	2	3	3	3	3
	VI	Design Collection / Portfolio	1	3	1	3	2	-	-	-	2	2	2	3	3	3	3
	VII	Fundamentals of economics and apparel costing															
	VII	Apparel Product Engineering Laboratory															
		PROFESSIONAL ELECTIVES [PEC]															
	V	Fashion forecasting	1	2	3	3	3	-	3	1	2	-	1	2	3	3	3
	V	Apparel Product Development	2	3	1	-	2	1	3	-	-	-	2	-	2	-	3
	V	Automations in Apparel manufacture	1	1.8	2.8	2.8	3	1	-	1	1.4	-	2	-	1.2	3	3
	V	Operation research in Apparel Industry	3	2	2	3	3	-	-	-	-	1	2	1	3	3	2
	V	Technology of non-wovens	1	1.2	1.4	0.2	1.2	0.6	1	0.2	0.8	0.4	0.8	1.2	0.6	0.8	0.8

	V	Visual merchandising	2	1	2	2	-	-	-	-	-	2	-	-	2	-	-
	V	Clothing Fit and comfort															
	V	Lean manufacturing	1	1.8	2.4	3	3	-	-	2.8	2	2	1	-	3	2	3
	V	Enterprise Resource Planning in Apparel industry	3	2	2	3	3	-	-	-	-	1	2	1	3	3	2
	V	Protective Garments	1.4	1.4	1.2	0.8	0.6	0.4	0.8	0.6	0.6	0.6	0.6	1.4	0.8	1	0.8
	V	Textile Heritage															
	V	Apparel trims, accessories and Embellishments															
	V	Supply chain management for Apparel Industry	-	-	-	-	1.8	2.8	3	2.4	2	2.6	1	1	1	3	3
	V	International Textile and apparel Business management	2	1	1	2	1	-	-	-	-	1	-	1	2	1	-
	V	Intimate apparels	1.4	1.8	2	1	0.8	0.8	1.2	1.2	0.6	0.6	0.8	1.4	0.8	1.4	1.2
	VI	Apparel Retail Management	2	2	3	2	-	-	-	-	-	-	2	-	2	3	-
	VI	Garment finishing and care															
	VI	Social compliances and quality assurance in apparel industry	-	-	-	-	-	3	2.6	3	1	2	2	3	1	3	2.8
	VI	Entrepreneurship in apparel manufacture	2	1.6	2	2.2	1.2	1.3	1.5	2.2	2.3	-	-	-	2	3	2
	VI	Smart Textiles and Garments	1.6	1.2	1.2	0.8	1	0.8	1.2	1	0.8	0.6	0.8	1.2	0.8	0.6	0.8
	VI	Apparel Brand management	1	2	3	1	2	-	-	-	-	-	-	-	-	2	-
	VI	Home Furnishing															
	VI	Advanced Technologies for Apparel Industry															
	VI	Sustainable apparel Business Management	2	2	2	3	3	3	3	3	-	-	-	-	2	3	2

	VI	Sports Textiles and Garments	1.6	1.4	1.6	1.8	1.2	1.2	1.2	1	1.4	0.8	1.4	1.4	1.2	1.2	1.4
	VI	Digital Marketing and E-Business	2	2	2	1	3	1	-	-	-	-	-	-	2	1	-
	VI	Knit Product Development															
	VI	Apparel Production Management															
	VI	Human Resource Management	2	1.3	1.2	1.7	1.8	1.4	1.3	2	1.2	1.2	1	1.7	2	1.6	1.5
	VI	Medical Textiles and Garments	1	1	1.4	1.4	0.8	1.4	1	1	1	0.8	1	1	1	1.2	1
		EMPLOYABILITY ENHANCEMENT COURSES (EEC)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
	V	Life Skills and Soft Skills															
	V	Industrial training/internship**	3	3	2	2.6	2.8	2	2	2.1	2.1	3	2.4	2.6	2.6	2.8	2.4
	VII	Industrial training/ internship*	3	3	2	2.6	2.8	2	2	2.1	2.1	3	2.4	2.6	2.6	2.8	2.4
	VIII	Industrial Training*/Project Work	3	3	3	3	1	1	1	2	2	2	2	1	3	2	3

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NON-AUTONOMOUS COLLEGES AFFILIATED COLLEGES
REGULATIONS 2021
B. TECH. FASHION TECHNOLOGY
CHOICE BASED CREDIT SYSTEM
CURRICULUM FOR SEMESTERS I TO VIII AND SYLLABI FOR SEMESTERS III AND IV
SEMESTER I

S. No.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	IP3151	Induction Programme	-	-	-	-	-	0
THEORY								
2.	HS3151	Professional English - I	HSMC	3	0	0	3	3
3.	MA3151	Matrices and Calculus	BSC	3	1	0	4	4
4.	PH3151	Engineering Physics	BSC	3	0	0	3	3
5.	CY3151	Engineering Chemistry	BSC	3	0	0	3	3
6.	GE3151	Problem Solving and Python Programming	ESC	3	0	0	3	3
7.	GE3172	**அறிவியல் தமிழ் / Scientific Thoughts in Tamil**	HSMC	1	0	0	1	1
PRACTICALS								
8.	GE3171	Problem Solving and Python Programming Laboratory	ESC	0	0	4	4	2
9.	BS3171	Physics and Chemistry Laboratory	BSC	0	0	4	4	2
10.	GE3172	English Laboratory $^{\$}$	EEC	0	0	2	2	1
			TOTAL	**16**	**1**	**10**	**27**	**22**

$ Skill Based Course

SEMESTER II

SI. NO.	COURSE CODE	COURSETITLE	CATE-GORY	PERIODS PERWEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	HS3251	Professional English - II	HSMC	2	0	0	2	2
2.	MA3251	Statistics and Numerical Methods	BSC	3	1	0	4	4
3.	FT3201	Fibre Science	PCC	3	0	0	3	3
4.	BE3252	Basic Electrical, Electronics and Instrumentation Engineering	ESC	3	0	0	3	3
5.	GE3251	Engineering Graphics	ESC	2	0	4	6	4
6.	CY3252	Chemistry for Textile Technologists	BSC	3	0	0	3	3
7.		NCC Credit Course Level 1#	-	2	0	0	2	2
8.	GE3252	**தமிழர் மரபு / Heritage of Tamils**	HSMC	1	0	0	1	1
PRACTICALS								
9.	GE3271	Engineering Practices Laboratory	ESC	0	0	4	4	2
10.	BE3272	Basic Electrical, Electronics and Instrumentation Engineering Laboratory	ESC	0	0	4	4	2
11.	GE3272	Communication Laboratory / Foreign Language [$]	EEC	0	0	4	4	2
			TOTAL	**17**	**1**	**16**	**34**	**26**

NCC Credit Course level 1 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

$ Skill Based Course

SEMESTER III

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	MA3357	Probability and Statistical Methods	BSC	3	1	0	4	4
2.	FT3001	Characteristics of Textile Fibres	PCC	3	0	0	3	3
3.	FT3002	Technology of Spinning processes	PCC	2	0	0	2	2
4.	FT3003	Fabric Manufacturing	PCC	3	0	0	3	3
5.	FT3004	Fabric Structures	PCC	3	0	0	3	3
6.	FT3005	Concepts and Evolution of Fashion and Design	PCC	3	0	0	3	3
PRACTICALS								
7.	FT3311	Fabric Structure Laboratory	PCC	0	0	3	3	1.5
8.	FT3312	Fashion Illustration Laboratory	PCC	0	0	3	3	1.5
9.	GE33361	Professional Development[$]	EEC	0	0	2	2	1
			TOTAL	**17**	**1**	**8**	**26**	**22**

$ Skill Based Course

SEMESTER IV

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	FT3401	Apparel Production Machinery	PCC	3	0	0	3	3
2.	FT3402	Fabric and Garment Quality Evaluation	PCC	3	0	2	5	4
3.	FT3403	Fundamentals of Garment Manufacturing	PCC	3	0	0	3	3
4.	FT3404	Pattern Engineering	PCC	3	0	0	3	3
5.	FT3405	Textile Chemical Processing	PCC	3	0	0	3	3
6.	GE3451	Environmental Sciences and Sustainability	BSC	2	0	0	2	2
7.		NCC Credit Course Level 2*		3	0	0	3	3 #
PRACTICALS								
8.	FT3411	Computer Aided Fashion Designing Laboratory	PCC	0	0	2	2	1
9.	FT3412	Basics of-Pattern Engineering and Garment Construction Laboratory	PCC	0	0	3	3	1.5
10.	FT3413	Textile Chemical Processing Lab	PCC	0	0	3	3	1.5
11.	FT3513	Industrial training/internship I*	EEC	0	0	0	0	0
			TOTAL	**17**	**0**	**10**	**27**	**22**

NCC Credit Course level 2 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

*Four weeks industrial training/internship carries two credits. Industrial training/internship during IV Semester Summer Vacation will be evaluated in V semester

SEMESTER V

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	FT3501	Garment Construction	PCC	3	0	0	3	3
2.	FT3591	Apparel Production Planning and Process Control	PCC	3	0	0	3	3
3.		Professional Elective I	PEC	3	0	0	3	3
4.		Professional Elective II	PEC	3	0	0	3	3
5.		Professional Elective III	PEC	3	0	0	3	3
6.		Mandatory Course-I[&]	MC	3	0	0	3	0
PRACTICALS								
7.	FT 3511	Garment Construction	PCC	0	0	3	3	1.5

		Laboratory – I						
8.	FT3512	Computer Aided Garment Designing Laboratory	PCC	0	0	3	3	1.5
9.	FT3513	Industrial training / internship I**	EEC	0	0	0	0	2
			TOTAL	**15**	**0**	**6**	**21**	**20**

[&] Mandatory Course-I is a Non-credit Course (Student shall select one course from the list given under MC-I)

**Four weeks industrial training/internship carries two credits. Industrial training/internship during IV Semester Summer Vacation will be evaluated in V semester

SEMESTER VI

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	FT3691	Apparel Marketing and Merchandising	PCC	3	0	0	3	3
2.	CFT331	Industrial Engineering in Garment Manufacturing	PCC	3	0	0	3	3
3.		Open Elective – I*	OEC	3	0	0	3	3
4.		Professional Elective IV	PEC	3	0	0	3	3
5.		Professional Elective V	PEC	3	0	0	3	3
6.		Professional Elective VI	PEC	3	0	0	3	3
7.		Mandatory Course-II[&]	MC	3	0	0	3	0
8.		NCC Credit Course Level 3**		3	0	0	3	3 #
PRACTICALS								
9.	FT3611	Garment Construction Laboratory – II	PCC	0	0	3	3	1.5
10.	FT3612	Design Collection / Portfolio	PCC	0	0	3	3	1.5
11.	FT3712	Industrial training/ Internship II**	EEC	0	0	0	0	0
			TOTAL	**21**	**0**	**6**	**27**	**21**

***Open Elective – I shall be chosen from the emerging technologies.**

**Two weeks industrial training/internship carries one credit. Industrial training/Internship during VI Semester Summer Vacation will be evaluated in VII semester

[&] Mandatory Course-II is a Non-credit Course (Student shall select one course from the list given under MC-II)

[#] NCC Credit Course level 3 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

SEMESTER VII/VIII*

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	FT3701	Fundamentals of economics and apparel costing	PCC	3	0	0	3	3
2.	GE3751	Human values and Ethics	HSMC	2	0	0	2	2
3.		Elective- Management #	HSMC	3	0	0	3	3
4.		Open Elective – II**	OEC	3	0	0	3	3
5.		Open Elective – III***	OEC	3	0	0	3	3
6.		Open Elective – IV***	OEC	3	0	0	3	3
PRACTICALS								
7.	FT3711	Apparel Product Engineering Laboratory	PCC	0	0	4	4	2
8.	FT3712	Industrial training/ Internship II##	EEC	0	0	0	0	2
			TOTAL	**17**	**0**	**4**	**21**	**21**

***If students undergo internship in Semester VII, then the courses offered during semester VII will be offered during semester VIII.**

****Open Elective – II shall be chosen from the emerging technologies.**

*****Open Elective III and IV (Shall be chosen from the list of open electives offered by other Programmes**

Elective- Management shall be chosen from the Elective Management courses

##Two weeks industrial training/internship carries one credit. Industrial training/Internship during VI Semester Summer Vacation will be evaluated in VII semester

SEMESTER VIII/VII*

S. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
PRACTICALS								
1.	FT3811	Internship#/ Project Work	EEC	0	0	20	20	10
			TOTAL	0	0	20	20	**10**

***If students undergo internship in Semester VII, then the courses offered during semester VII will be offered during semester VIII.**

#15 weeks of continuous Internship in an organization carries 10 credits.

TOTAL CREDITS : 164

ELECTIVE – MANAGEMENT COURSES

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PERWEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	GE3751	Principles of Management	HSMC	3	0	0	3	3
2.	GE3752	Total Quality Management	HSMC	3	0	0	3	3
3.	GE3753	Engineering Economics and Financial Accounting	HSMC	3	0	0	3	3
4.	GE3754	Human Resource Management	HSMC	3	0	0	3	3
5.	GE3755	Knowledge Management	HSMC	3	0	0	3	3
6.	GE3792	Industrial Management	HSMC	3	0	0	3	3

MANDATORY COURSES I

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	MX3081	Introduction to Women and Gender Studies	MC	3	0	0	3	0
2.	MX3082	Elements of Literature	MC	3	0	0	3	0
3.	MX3083	Film Appreciation	MC	3	0	0	3	0
4.	MX3084	Disaster Management	MC	3	0	0	3	0

MANDATORY COURSES II

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	MX3085	Well Being with traditional practices (Yoga, Ayurveda and Siddha)	MC	3	0	0	3	0
2.	MX3086	History of Science and Technology in India	MC	3	0	0	3	0
3.	MX3087	Political and Economic Thought for a Humane Society	MC	3	0	0	3	0
4.	MX3088	State, Nation Building and Politics in India	MC	3	0	0	3	0
5.	MX3089	Industrial Safety	MC	3	0	0	3	0

PROFESSIONAL ELECTIVE COURSES : VERTICALS

Vertical I Apparel Marketing	Vertical II Apparel Product Development	Vertical III Garment Manufacturing	Vertical IV Management	Vertical V Specialty Apparel
Fashion forecasting	Apparel Product Development	Automations in Apparel manufacture	Operation research in Apparel Industry	Technology of non-wovens
Visual merchandising	Clothing Fit and comfort	Lean manufacturing	Enterprise Resource Planning in Apparel industry	Protective Garments
Textile Heritage	Apparel trims, accessories and Embellishments	Supply chain management for Apparel Industry	International Textile and apparel Business management	Intimate apparels
Apparel Retail Management	Garment finishing and care	Social compliances and quality assurance in apparel industry	Entrepreneurship in apparel manufacture	Smart Textiles and Garments
Apparel Brand management	Home Furnishing	Advanced Technologies for Apparel Industry	Sustainable apparel Business Management	Sports Textiles and Garments
Digital Marketing and E-Business	Knit Product Development	Computer Applications In Apparel Manufacturing	Human Resource Management	Medical Textiles and Garments

Registration of Professional Elective Courses from Verticals:

Professional Elective Courses will be registered in Semesters V and VI. These courses are listed in groups called verticals that represent a particular area of specialisation. Students are permitted to choose all Professional Electives from a particular vertical or from different verticals. Further, only one Professional Elective course shall be chosen in a semester horizontally (row-wise). However, two courses are permitted from the same row, provided one course is enrolled in Semester V and another in semester VI.

The registration of courses for B.E./B.Tech (Honours) or Minor degree shall be done from Semester V to VIII. The procedure for registration of courses explained above shall be followed for the courses of B.E/B.Tech (Honours) or Minor degree also. For more details on B.E./B.Tech (Honours) or Minor degree refer to Regulations 2021 Clause 4.10.

PROFESSIONAL ELECTIVE COURSES : VERTICALS

VERTICAL I: APPAREL MARKETING APPAREL MARKETING

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	FT3001	Fashion forecasting	PEC	3	0	0	3	3
2.	FT3002	Visual merchandising	PEC	3	0	0	3	3
3.	FT3003	Textile Heritage	PEC	3	0	0	3	3
4.	FT3004	Apparel Retail Management	PEC	3	0	0	3	3
5.	FT3005	Apparel Brand management	PEC	3	0	0	3	3
6.	FT3006	Digital Marketing and E-Business	PEC	3	0	0	3	3

VERTICAL II: APPAREL PRODUCT DEVELOPMENT

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	FT3007	Apparel Product Development	PEC	3	0	0	3	3
2.	FT3008	Clothing Fit and comfort	PEC	3	0	0	3	3
3.	FT3009	Apparel trims, accessories and Embellishments	PEC	3	0	0	3	3
4.	FT3010	Garment finishing and care	PEC	3	0	0	3	3
5.	FT3011	Home Furnishing	PEC	3	0	0	3	3
6.	FT3012	Knit Product Development	PEC	3	0	0	3	3

VERTICAL III : GARMENT MANUFACTURING

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	FT3013	Automations in Apparel manufacture	PEC	3	0	0	3	3
2.	FT3014	Lean manufacturing	PEC	3	0	0	3	3
3.	FT3015	Supply chain management for Apparel Industry	PEC	3	0	0	3	3
4.	FT3016	Social compliances and quality assurance in apparel industry	PEC	3	0	0	3	3
5.	FT3017	Advanced Technologies for Apparel Industry	PEC	3	0	0	3	3
6.	FT3018	Apparel Production Management	PEC	3	0	0	3	3

VERTICAL IV : MANAGEMENT

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	FT3019	Operation research in Apparel Industry	PEC	3	0	0	3	3
2.	FT3020	Enterprise Resource Planning in Apparel industry	PEC	3	0	0	3	3
3.	FT3021	International Textile and apparel Business management	PEC	3	0	0	3	3
4.	FT3022	Entrepreneurship in apparel manufacture	PEC	3	0	0	3	3
5.	FT3023	Sustainable apparel Business Management	PEC	3	0	0	3	3
6.	FT3024	Human Resource Management	PEC	3	0	0	3	3

VERTICAL V : SPECIALTY APPAREL

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	TT3691	Technology of non-wovens	PEC	3	0	0	3	3
2.	FT3025	Protective Garments	PEC	3	0	0	3	3
3.	FT3026	Intimate apparels	PEC	3	0	0	3	3
4.	FT3027	Smart Textiles and Garments	PEC	3	0	0	3	3
5.	FT3028	Sports Textiles and Garments	PEC	3	0	0	3	3
6.	FT3029	Medical Textiles and Garments	PEC	3	0	0	3	3

OPEN ELECTIVES

(Students shall choose the open elective courses, such that the course contents are not similar to any other course contents/title under other course categories.

OPEN ELECTIVE I AND II
(EMERGING TECHNOLOGIES)

To be offered other than Faculty of Information and Communication Engineering

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	OCS351	Artificial Intelligence and Machine Learning Fundamentals	OEC	2	0	2	4	3
2.	OCS352	IoT Concepts and Applications	OEC	2	0	2	4	3
3.	OCS353	Data Science Fundamentals	OEC	2	0	2	4	3
4.	OCS354	Augmented and Virtual Reality	OEC	2	0	2	4	3

OPEN ELECTIVES – III

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	OHS351	English for Competitive Examinations	OEC	3	0	0	3	3
2.	OCE353	Lean Concepts, Tools And Practices	OEC	3	0	0	3	3
3.	OMG352	NGOs and Sustainable Development	OEC	3	0	0	3	3
4.	OMG353	Democracy and Good Governance	OEC	3	0	0	3	3
5.	OME353	Renewable Energy Technologies	OEC	3	0	0	3	3
6.	OME354	Applied Design Thinking	OEC	2	0	2	4	3
7.	OMF351	Reverse Engineering	OEC	3	0	0	3	3
8.	OMF353	Sustainable Manufacturing	OEC	3	0	0	3	3
9.	OAU351	Electric and Hybrid Vehicle	OEC	3	0	0	3	3
10.	OAS352	Space Engineering	OEC	3	0	0	3	3
11.	OIM351	Industrial Management	OEC	3	0	0	3	3

12.	OIE354	Quality Engineering	OEC	3	0	0	3	3
13.	OSF351	Fire Safety Engineering	OEC	3	0	0	3	3
14.	OML351	Introduction to non-destructive testing	OEC	3	0	0	3	3
15.	OMR351	Mechatronics	OEC	3	0	0	3	3
16.	ORA351	Foundation of Robotics	OEC	3	0	0	3	3
17.	OAE352	Fundamentals of Aeronautical engineering	OEC	3	0	0	3	3
18.	OGI351	Remote Sensing Concepts	OEC	3	0	0	3	3
19.	OAI351	Urban Agriculture	OEC	3	0	0	3	3
20.	OEN351	Drinking Water Supply and Treatment	OEC	3	0	0	3	3
21.	OEE352	Electric Vehicle technology	OEC	3	0	0	3	3
22.	OEI353	Introduction to PLC Programming	OEC	3	0	0	3	3
23.	OBT352	Biomedical Instrumentation	OEC	3	0	0	3	3
24.	OFD352	Traditional Indian Foods	OEC	3	0	0	3	3
25.	OFD353	Introduction to food processing	OEC	3	0	0	3	3
26.	OPY352	IPR for Pharma Industry	OEC	3	0	0	3	3
27.	OCH351	Nano Technology	OEC	3	0	0	3	3
28.	OCH352	Functional Materials	OEC	3	0	0	3	3
29.	OPE351	Introduction to Petroleum Refining and Petrochemicals	OEC	3	0	0	3	3
30.	OPE352	Energy Conservation and Management	OEC	3	0	0	3	3
31.	OPT351	Basics of Plastics Processing	OEC	3	0	0	3	3
32.	OEC351	Signals and Systems	OEC	3	0	0	3	3
33.	OEC352	Fundamentals of Electronic Devices and Circuits	OEC	3	0	0	3	3
34.	OBM351	Foundation Skills in integrated product Development	OEC	3	0	0	3	3
35.	OBM352	Assistive Technology	OEC	3	0	0	3	3
36.	OMA352	Operations Research	OEC	3	0	0	3	3

37.	OMA353	Algebra and Number Theory	OEC	3	0	0	3	3
38.	OMA354	Linear Algebra	OEC	3	0	0	3	3

OPEN ELECTIVES – IV

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	OHS352	Project Report Writing	OEC	3	0	0	3	3
2.	OCE354	Basics of Integrated Water Resources Management	OEC	3	0	0	3	3
3.	OMA355	Advanced Numerical Methods	OEC	3	0	0	3	3
4.	OMA356	Random Processes	OEC	3	0	0	3	3
5.	OMA357	Queuing and Reliability Modelling	OEC	3	0	0	3	3
6.	OMG354	Production and Operations Management for Entrepreneurs	OEC	3	0	0	3	3
7.	OMG355	Multivariate Data Analysis	OEC	3	0	0	3	3
8.	OME352	Additive Manufacturing	OEC	3	0	0	3	3
9.	OME353	New Product Development	OEC	3	0	0	3	3
10.	OME355	Industrial Design & Rapid Prototyping Techniques	OEC	2	0	2	4	3
11.	OMF352	Micro and Precision Engineering	OEC	3	0	0	3	3
12.	OMF354	Cost Management of Engineering Projects	OEC	3	0	0	3	3
13.	OAU352	Batteries and Management system	OEC	3	0	0	3	3
14.	OAU353	Sensors and Actuators	OEC	3	0	0	3	3
15.	OAS353	Space Vehicles	OEC	3	0	0	3	3
16.	OIM352	Management Science	OEC	3	0	0	3	3
17.	OIM353	Production Planning and Control	OEC	3	0	0	3	3
18.	OIE353	Operations	OEC	3	0	0	3	3

		Management						
19.	OSF352	Industrial Hygiene	OEC	3	0	0	3	3
20.	OSF353	Chemical Process Safety	OEC	3	0	0	3	3
21.	OML352	Electrical, Electronic and Magnetic materials	OEC	3	0	0	3	3
22.	OML353	Nanomaterials and applications	OEC	3	0	0	3	3
23.	OMR352	Hydraulics and Pneumatics	OEC	3	0	0	3	3
24.	OMR353	Sensors	OEC	3	0	0	3	3
25.	ORA352	Foundation of Automation	OEC	3	0	0	3	3
26.	ORA353	Concepts in Mobile Robotics	OEC	3	0	0	3	3
27.	OMV351	Marine Propulsion	OEC	3	0	0	3	3
28.	OMV352	Marine Merchant Vehicles	OEC	3	0	0	3	3
29.	OMV353	Elements of Marine Engineering	OEC	3	0	0	3	3
30.	OAE353	Drone Technologies	OEC	3	0	0	3	3
31.	OGI352	Geographical Information System	OEC	3	0	0	3	3
32.	OAI352	Agriculture Entrepreneurship Development	OEC	3	0	0	3	3
33.	OEN352	Biodiversity Conservation	OEC	3	0	0	3	3
34.	OEE353	Introduction to control systems	OEC	3	0	0	3	3
35.	OEI354	Introduction to Industrial Automation Systems	OEC	3	0	0	3	3
36.	OBT353	Environment and Agriculture	OEC	3	0	0	3	3
37.	OFD354	Fundamentals of Food Engineering	OEC	3	0	0	3	3
38.	OFD355	Food safety and Quality Regulations	OEC	3	0	0	3	3
39.	OPY353	Nutraceuticals	OEC	3	0	0	3	3
40.	OCH353	Energy Technology	OEC	3	0	0	3	3
41.	OCH354	Surface Science	OEC	3	0	0	3	3
42.	OPE353	Industrial safety	OEC	3	0	0	3	3
43.	OPE354	Unit Operations in Petro Chemical Industries	OEC	3	0	0	3	3

44.	OPT352	Plastic Materials for Engineers	OEC	3	0	0	3	3
45.	OPT353	Properties and Testing of Plastics	OEC	3	0	0	3	3
46.	OEC353	VLSI Design	OEC	3	0	0	3	3
47.	OEC354	Industrial IoT and Industry 4.0	OEC	2	0	2	4	3
48.	OBM353	Wearable devices	OEC	3	0	0	3	3
49.	OBM354	Medical Informatics	OEC	3	0	0	3	3

SUMMARY

Name of the Programme										
S.No	Subject Area	Credits per Semester								Total Credits
		I	II	III	IV	V	VI	VII/VIII	VIII/VII	
1	HSMC	4	3					5		12
2	BSC	12	7	4	2					25
3	ESC	5	11							16
4	PCC		3	17	20	9	9	5		63
5	PEC					9	9			18
6	OEC						3	9		12
7	EEC	1	2	1		2		2	10	18
8	Non-Credit /(Mandatory)					√	√			
Total		22	26	22	22	20	21	21	10	164

Enrollment for B.E. / B. Tech. (Honours) / Minor degree (Optional)

A student can also optionally register for additional courses (18 credits) and become eligible for the award of B.E./B.Tech. (Honours) Minor degree.

For B.E. / B. Tech. (Honours), a student shall register for the additional courses (18 credits) from semester V onwards. These courses shall be from the same vertical or a combination of different verticals of the same programme of study only.

For minor degree, a student shall register for the additional courses (18 credits) from semester V onwards. All these courses have to be in a particular vertical from any one of the other programmes, Moreover, for minor degree the student can register for courses from any one of the following verticals also.

Complete details are available in clause 4.10 of Regulations 2021.

VERTICALS FOR MINOR DEGREE (IN ADDITIONS TO ALL THE VERTICALS OF OTHER PROGRAMMES)

Vertical I Fintech and Block Chain	**Vertical II Entrepreneurship**	**Vertical III Public Administration**	**Vertical IV Business Data Analytics**	**Vertical V Environment and Sustainability**
Financial Management	Foundations of Entrepreneruship	Principles of Public Administration	Statistics For Managemen t	Sustainable infrastructure Development
Fundamentals of Investment	Team Building & Leadership Management for Business	Constitution of India	Datamining For Business Intelligence	Sustainable Agriculture and Environmental Management
Banking, Financial Services and Insurance	Creativity & Innovation in Entrepreneurship	Public Personnel Administration	Human Resource Analytics	Sustainable Bio Materials
Introduction to Blockchain and its Applications	Principles of Marketing Management For Business	Administrative Theories	Marketing And Social Media Web Analytics	Materials for Energy Sustainability
Fintech Personal Finance and Payments	Human Resource Management for Entrepreneurs	Indian Administrative System	Operation And Supply Chain Analytics	Green Technology
Introduction to Fintech	Financing New Business Ventures	Public Policy Administration	Financial Analytics	Environmental Quality Monitoring and Analysis
-	-	-	-	Integrated Energy Planning for Sustainable Development
-	-	-	-	Energy Efficiency for Sustainable Development

(Choice of courses for Minor degree is to be made from any one vertical of other programmes or from anyone of the following verticals)

VERTICAL 1: FINTECH AND BLOCK CHAIN

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	CMG331	Financial Management	PEC	3	0	0	3	3
2.	CMG332	Fundamentals of Investment	PEC	3	0	0	3	3
3.	CMG333	Banking, Financial Services and Insurance	PEC	3	0	0	3	3
4.	CMG334	Introduction to Blockchain and its Applications	PEC	3	0	0	3	3
5.	CMG335	Fintech Personal Finance and Payments	PEC	3	0	0	3	3
6.	CMG336	Introduction to Fintech	PEC	3	0	0	3	3

VERTICAL 2: ENTREPRENEURSHIP

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	CMG337	Foundations of Entrepreneruship	PEC	3	0	0	3	3
2.	CMG338	Team Building & Leadership Management for Business	PEC	3	0	0	3	3
3.	CMG339	Creativity & Innovation in Entrepreneurship	PEC	3	0	0	3	3
4.	CMG340	Principles of Marketing Management For Business	PEC	3	0	0	3	3
5.	CMG341	Human Resource Management for Entrepreneurs	PEC	3	0	0	3	3
6.	CMG342	Financing New Business Ventures	PEC	3	0	0	3	3

VERTICAL 3: PUBLIC ADMINISTRATION

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	CMG343	Principles of Public Administration	PEC	3	0	0	3	3
2.	CMG344	Constitution of India	PEC	3	0	0	3	3
3.	CMG345	Public Personnel Administration	PEC	3	0	0	3	3
4.	CMG346	Administrative Theories	PEC	3	0	0	3	3
5.	CMG347	Indian Administrative System	PEC	3	0	0	3	3
6.	CMG348	Public Policy Administration	PEC	3	0	0	3	3

VERTICAL 4: BUSINESS DATA ANALYTICS

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	CMG349	Statistics For Management	PEC	3	0	0	3	3
2.	CMG350	Datamining For Business Intelligence	PEC	3	0	0	3	3
3.	CMG351	Human Resource Analytics	PEC	3	0	0	3	3
4.	CMG352	Marketing And Social Media Web Analytics	PEC	3	0	0	3	3
5.	CMG353	Operation And Supply Chain Analytics	PEC	3	0	0	3	3
6.	CMG354	Financial Analytics	PEC	3	0	0	3	3

VERTICAL 5: ENVIRONMENT AND SUSTAINABILITY

SL. NO.	COURSE CODE	COURSE TITLE	CATE GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	CES331	Sustainable infrastructure Development	PEC	3	0	0	3	3
2.	CES332	Sustainable Agriculture and Environmental Management	PEC	3	0	0	3	3
3.	CES333	Sustainable Bio Materials	PEC	3	0	0	3	3
4.	CES334	Materials for Energy Sustainability	PEC	3	0	0	3	3
5.	CES335	Green Technology	PEC	3	0	0	3	3
6.	CES336	Environmental Quality Monitoring and Analysis	PEC	3	0	0	3	3
7.	CES337	Integrated Energy Planning for Sustainable Development	PEC	3	0	0	3	3
8.	CES338	Energy Efficiency for Sustainable Development	PEC	3	0	0	3	3

MA3357 PROBABILITY AND STATISTICAL METHODS L T P C
3 1 0 4

COURSE OBJECTIVES:

- To develop Probability techniques in manufacturing and quality evaluation process.
- To familiarize the students with two dimensional random variables.
- To familiarize the student with Differential Equations.
- To make the students to understand various techniques of Correlation and Time series Analysis.
- To acquaint the student with mathematical tools needed in evaluating Statistical quality control and to apply in the textile manufacturing industry.

UNIT – I: PROBABILITY AND RANDOM VARIABLES 9 + 3

Probability – axioms of probability – Conditional probability – Baye's theorem - Discrete and continuous random variables – Moments – Moment Generating functions – Binomial, Poisson, Geometric, Uniform , Exponential , Gamma and Normal distributions.

UNIT – II: TWO DIMENSIONAL RANDOM VARIABLES 9 + 3

Join distributions – Marginal distributions and conditional distributions –Moments - Covariance - Transforms of random variables – Central limit theorem.

UNIT – III: DIFFERENTIAL EQUATIONS 9 + 3

Higher order linear differential equations with constant coefficients – Method of variation of parameters – Homogenous equation of Euler's and Legendre's type – System of simultaneous linear differential equations with constant coefficients – Method of undermined coefficients.

UNIT – IV: CORRELATION, REGRESSION, INDEX NUMBERS AND TIMES SERIES ANALYSIS 9 + 3

Correlation analysis, estimation of regression line. Time series analysis: Variations in time series, trend analysis , cyclical variations , seasonal variations and irregular variations. Index Numbers – Lasperyre's, Paasche's and Fisher's Ideal Index.

UNIT – V: STATISTICAL QUALITY CONTROL 9 + 3

Control charts for measurements (X and R chart) – Control charts for attributes (p ,C and np) charts – Tolerance limits – acceptance Sampling.

TOTAL PERIODS: 60

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1: Use the Probability techniques for solving practical problems.

CO2: Apply two dimensional random variable tools in solving various problems.

CO3: Able to solve differential Equations by applying various techniques.

CO4: Apply different methods of Correlation, Regression, Index Numbers and Times series analysis in solving practical problems.

CO5: Apply statistical techniques in solving manufacturing and management related problems

TEXTBOOKS:

1. Johnson, R.A., Miller, I and Freund J., "Miller and Freund's Probability and Statistics for Engineers", Pearson Education, Asia, 8th Edition, 2015.
2. Milton. J. S. and Arnold. J.C., "Introduction to Probability and Statistics", Tata McGraw Hill, 4th Edition, 2007.
3. Kreyszig.E, "Advanced Engineering Mathematics", John Wiley and Sons, 10 th Edition, New Delhi, 2016.
4. Grewal.B.S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44 th Edition , 2018.
5. Richard I. Levin, David S. Rubin, Sanjay Rastogi Masood Husain Siddiqui, Statistics for Management, Pearson Education, 7th Edition, 2016.

REFERENCES:

1. Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage Learning, New Delhi, 8th Edition, 2014.
2. Papoulis, A. and Unnikrishnapillai, S., "Probability, Random Variables and Stochastic Processes", McGraw Hill Education India, 4th Edition, New Delhi, 2010.
3. Jain . R.K. and Iyengar. S.R.K., " Advanced Engineering Mathematics ", Narosa Publications, New Delhi, 5 th Edition, 2016.
4. Ramana. B.V., " Higher Engineering Mathematics ", McGraw Hill Education Pvt. Ltd, New Delhi, 2016.
5. Prem.S.Mann, "Introductory Statistics" 7th Edition, Wiley India, 2016.
6. Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani, "An Introduction to Statistical Learning with Applications in R", Springer, 2016.
7. Aczel A.D. and Sounderpandian J., "Complete Business Statistics", 6th edition, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2012.

FT3001 CHARACTERISTICS OF TEXTILE FIBRES L T P C
3 0 0 3

OBJECTIVES

To enable the students to understand the

- Physical characteristics of textile fibres

UNIT I STRUCTURE AND INVESTIGATION TECHNIQUES OF FIBRES 9

Classification of fibres; study of morphological structures of fibers; Transmission and Scanning electron microscopes-principle; construction and working; X-ray diffraction techniques – estimation of crystallinity; Infrared radiation and dichroism techniques

UNIT II MOISTURE ABSORPTION CHARACTERISTICS 9

Theories of moisture sorption; moisture absorption behavior of natural and man-made fibres; influence of fibre structure, humidity and temperature on the moisture absorption; conditioning of fibres –mechanism of conditioning and factors influencing conditioning .moisture diffusion in fibres; heat of sorption – factors influencing heat of sorption - measurement of heat of sorption

UNIT III TENSILE AND ELONGATION CHARACTERISTICS OF FIBRES 9

Tensile characteristics –study of strength, elongation, work of rupture, initial modulus, work factor and yield point – determination of yield point. stress-strain relations of natural and manmade fibres - influence of fibre structure, humidity and temperature on tensile characteristics. time effects- study of creep phenomena.

UNIT IV ELASTIC RECOVERY BEHAVIOUR OF FIBRES 9

Elastic recovery and its relation to stress and strain of fibres; mechanical conditioning of fibres and its influence on elastic recovery .load cycling and extension cycling-their effect on elastic recovery. introduction about torsional and flexural rigidity of fibers

UNIT V OPTICAL, FRICTIONAL, AND THERMAL CHARACTERISTICS 9

Reflexion and lustre-objective and subjective methods of measurement - refractive index and its measurement - friction – its measurement, comparison of fibres, directional friction in wool – friction. thermal transitions of fibres - thermal conductivity, thermal expansion and contraction, Tg, melting; static electricity in textile fibres

TOTAL: 45 PERIODS

Course Outcomes

CO1	Investigate and identify fibers based on their morphological structure
CO2	Identify the factors influencing moisture and heat sorption behavior of fibres
CO3	Identify the factors influencing tensile and elongation behavior of fibres
CO4	Understand the elastic recovery behaviour of fibres
CO5	Understand and measure the optical, frictional, and thermal characteristics of fibres

TEXTBOOKS

1.MortonW.E.,andHearleJ.W.S.,"PhysicalPropertiesofTextileFibres",TheTextileInstitute, Washington D.C., 2008, ISBN978-1-84569-220-95

2.HearleJ.W.S,LomasB.,andCookeW.D.,"AtlasofFibreFractureandDamagetoTextiles", The Textile Institute, 2nd Edition, 1998, ISBN:1855733196

REFERENCES

1. Meredith R., and Hearle J. W. S., "Physical Methods of Investigation of Textiles", Wiley Publication,New York, 1989, ISBN: B00JCV6ZWU ISBN-13:

2. MukhopadhyayS. K., "Advances in Fibre Science", The Textile Institute,1992, ISBN: 1870812379

3.MeredithR.,"MechanicalPropertiesofTextileFibres",NorthHolland,Amsterdam,1986,ISBN: 1114790699, ISBN-13:9781114790698

4. RaheelM. (ed.)., "Modern Textile Characterization Methods", Marcel Dekker, 1995, ISBN:0824794737

5. Mukhopadhyay. S. K., "The Structure and Properties of Typical Melt Spun Fibres", Textile Progress, Vol. 18, No. 4, Textile Institute, 1989, ISBN:1870812115

6. Hearle J.W.S., "Polymers and Their Properties: Fundamentals of Structures and Mechanics Vol1",EllisHorwood,England,1982,ISBN:047027302X|ISBN-13:9780470273029

7. Greaves. P. H., and Saville B.P., "Microscopy of Textile Fibres", Bios Scientific, U.K., 1995, ISBN:1872748244ISBN-13:9781872748245

8. Seville. B. P., "Physical Testing of Textiles", Woodhead Publishing, 1999,ISBN: 1855733676 | ISBN-13:9781855733671

9. Hearle J. W. S., and Peters. R. H., “Fibre structure”, Elsevier Ltd, 1963, ISBN: 1483212211 | ISBN-13:9781483212210

Course Outcomes	Statement	Program Outcome														
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Investigate and identify fibers based on their morphological structure	3	3	3	3	2	-	-	-	-	-	-	2	3	1	2
CO2	Identify the factors influencing moisture and heat sorption behavior of fibres	3	3	3	3	2	-	-	-	-	-	-	2	3	1	2
CO3	Identify the factors influencing tensile and elongation behavior of fibres	3	3	3	3	2	-	-	-	-	-	-	2	3	1	2
CO4	Understand the elastic recovery behaviour of fibres	3	3	3	3	2	-	-	-	-	-	-	2	3	1	2
CO5	Understand and measure the optical, frictional, and thermal characteristics of fibres	3	3	3	3	2	-	-	-	-	-	-	2	3	1	2
Overall CO		3	3	3	3	2	-	-	-	-	-	-	2	3	1	2

FT3002 TECHNOLOGY OF SPINNING PROCESSES L T P C
2 0 0 2

OBJECTIVE:
To enable the students to understand various processes involved in conversion of fibre to yarn by various spinning system and other modern spinning systems.

UNIT I OUTLINE & PASSAGE FLOW OF SHORT STAPLE SPINNING 10
Linear density systems for textile materials; – objectives, types, working principle of Ginning , blow room , **Carding ,drawing machine** ,**roving machine, Ring spinning**

UNIT II OUTLINE & PASSAGE FLOW OF LONG STAPLE SPINNING 4
Comber preparation – objectives, principles of sliver lap ribbon lap and super lap formers; comber- principle of combing, sequence of combing operation.

UNIT III OUTLINE & PASSAGE FLOW OF OPEN END SPINNING 6
Principles of yarn formation and material flow – rotor, friction, air-jet and air vortex spinning machines ; core, wrap spinning system, comparison of yarn properties

UNIT IV OUTLINE & PASSAGE FLOW OF SEWING THREAD AND SPECIALITY YARNS: 5
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, application . Core spun yarns.

UNIT V OUTLINE & PASSAGE FLOW OF SPECIALITY SPINNING 5
Melt spinning, Dry spinning, Sol gel spinning, Hollow spinning, specialized non-circular cross section fibres, spinning for - nonwovens, Optical fibres, thermotropic liquid-crystal polymers, Electro spinning.

TOTAL: 30 PERIODS

OUTCOMES:
Upon completion of this course, the student shall understand
Process sequence for producing different types of yarns
Principle of machines used for production of yarn
Principle of Technology used to produce different types of yarns.

TEXT BOOKS:

1. Lawrence C.A. Advances in Yarn Spinning Technology, Woodhead publishing, 2010
2. Klein W., "The Technology of Short-staple Spinning", The Textile Institute, Manchester, 1998.
3. Oxtoby E., “Spun Yarn Technology “, Butterworth, London, 1987, ISBN: 0408014644/ISBN- 13: 9780408014649.
4. Bin Ding, Xianfeng Wang and Jianyong Yu, Electrospinning: Nanofabrication and Applications, Woodhead publishing, 2019

REFERENCES:

1. Klein W., “The Rieter Manual of Spinning, Vol.1”, Rieter Machine Works Ltd., Winterthur, 2014, ISBN 10 3-9523173-1-4 / ISBN 13 978-3-9523173-1-0.
2. Klein W., “The Rieter Manual of Spinning, Vol.2”, Rieter Machine Works Ltd., Winterthur, 2014, ISBN 10 3-9523173-2-2 / ISBN 13 978-3-9523173-2-7.
3. Klein W., “The Rieter Manual of Spinning, Vol.3”, Rieter Machine Works Ltd., Winterthur, 2014, ISBN 10 3-9523173-3-0 / ISBN 13 978-3-9523173-3-4
4. Klein W., and Stalder H., “The Rieter Manual of Spinning", Vol.4, Rieter Machine Works Ltd., Winterthur, 2014, ISBN: 10 3-9523173-4-9 / ISBN: 13 978-3-9523173.
5. Ernst H., “The Rieter Manual of Spinning", Vol.5, Rieter Machine Works Ltd., Winterthur, 2014, ISBN: 10 3-9523173-5-7 / ISBN: 13 978-3-9523173-5-8
6. Stalder H., “The Rieter Manual of Spinning", Vol.6, Rieter Machine Works Ltd., Winterthur, 2014, ISBN: 10 3-9523173-6-5 / ISBN: 13 978-3-9523173-6-5.
7. Thomas Weide, “The Rieter Manual of Spinning", Vol.7, Rieter Machine Works Ltd., Winterthur, 2014, ISBN: 10 3-9523173-7-3 / ISBN: 13 978-3-9523173-7-2.
8. Lord P. R., “Yarn Production: Science, Technology and Economics”, The Textile Institute, Manchester, 2003, ISBN: 1855736969 | ISBN-13: 9781855736962
9. Doraiswamy I., Chellamani P., and Pavendhan A., “Cotton Ginning, Textile Progress”, The Textile Institute, Manchester, 1993, ISBN: 1870812484 / ISBN: 978-1870812481.
10. Salhotra K. R., and Ishtiaque S. M., “Rotor Spinning; its Advantages”, Limitations and Prospects in India, ATIRA, Ahmedabad, 1995
11. Trommer G., “Rotor Spinning”, Meliand Textile benchte GmbH, Rohrbacher, 1995, ISBN: 3871505099 | ISBN-13: 9783871505096
12. Lawerence C. A., and Chen K. Z., “Rotor Spinning”, Textile Progress, The Textile Institute, Manchester, 1984, ISBN: 0900739681 / ISBN: 978-0900739682

Course Articulation Matrix:

Course Outcomes	Statement	Program Outcome														
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	Infer the short staple spinning process and machineries	3	3	3	3	2	2	2	3	3	2	2	3	1	1	3
CO2	Infer the long staple spinning process and machineries	3	3	3	3	2	2	2	3	3	2	2	3	1	1	3
CO3	Outline the process of open-end spinning.	3	3	3	3	2	2	2	3	3	2	2	3	1	1	3
CO4	Apply the spinning concepts in fancy yarns and product diversifications.	3	3	3	3	2	2	2	3	3	2	2	3	1	1	3
CO5	Outline the process of speciality spinning	3	3	3	3	2	2	2	3	3	2	2	3	1	1	3
Overall CO		3	3	3	3	2	2	2	2	3	2	2	3	1	1	3

1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively

FT3003 **FABRIC MANUFACTURING** **L T P C**
3 0 0 3

OBJECTIVES:

To teach preparatory processes, primary and secondary mechanisms auxiliary, additional mechanisms of shuttle looms; weft insertion principles of shuttle less looms
To teach knitting process, principles of weft and warp knitting machines,
To teach principles involved in the manufacturing of nonwoven fabric

UNIT I **9**

Basics of Woven Fabrics: Different kinds of fabrics, Woven fabrics, Warp, Weft, Weaving; Preparatory processes for single and folded yarn
Yarn Winding Machines: Objectives, yarn passage in Cone Winding machine and Pirn Winding machine.
Warping Machines: Objectives, warp passage in Back beam warping machine and Sectional warping machine.
Sizing and Gaiting: Objects of sizing, sizing ingredients and its function; Drawing-in, Denting, and Knotting or Piecing; Gaiting

UNIT II **9**

Basic Concepts of Loom: Loom, Parts of Loom, Path of Warp in loom; Motions of Weaving –Primary, Secondary, and Auxiliary motions; Types of looms, Loom speed and Efficiency
Primary Mechanisms: Basic working principles of Tappet Shedding, Cone over Picking, Cone under Picking, Side lever Under Picking, Crank Beat-up, Timings of Primary Motions
Secondary Mechanisms: Negative Let-off mechanism, Positive Seven wheels Take-up mechanism.
Objectives of Auxiliary Motions: Temple, Brake/Starting handle, Warp stop, Warp protecting, Weft stop, Drop box

UNIT III **9**

Other Shedding Devices: Basic working principles Climax Dobby and Single lift single cylinder Jacquard
Shuttle less looms: Basic principles of weft insertion by Projectile, Single Rapier, Double Rapier, Air jet, water jet; Multi-phase weaving; Principles 3D fabric weaving
Defects and Inspection: Woven fabric Defects, Causes and Remedies; Fabric inspection, 4-points system, Classification of defects, Inspection procedure

UNIT IV **9**

Classification of knitting processes – weft knit and warp knit; yarn quality requirements for knitting; principles of knitting; types of knitting needles – Bearded, Latch &Compound needle; Weft
knitting machines: Principles of Flat knitting machine and Circular knitting machine, - Circular bearded needle single-jersey fabric machine, Revolving cylinder latch needle machine, Circular garment length machine
Warp knitting machines: needle bar, sinker bar, guide bar –pattern wheel –chain link-Warp knitting fundamentals- Knitting cycle for warp knitting- closed lap and open lap stitches – Raschel, compound needle and Tricot knitting machines- Comparison of raschel and tricot knitting machines

UNIT V 9

Web preparation for nonwovens – Principle, machines, processes for web preparation by dry laid, wet laid and air laid; web preparation by polymeric solution, Spun bonding and Melt blown process.

Bonding of nonwoven: Bonding methods- principles, machine; processes for mechanical, thermal, chemical bonding; Finishes, Properties and uses of nonwoven fabrics

TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of this course, the student shall be able to

CO1: Describe the objectives and principles of winding, warping machines and the objectives of sizing

CO2: Explain the basic concepts of loom and the working principle of primary, secondary, and auxiliary mechanisms of power loom

CO3: Explain the working principle of dobby, jacquard, and shuttle less looms; Describe the fabric defects, causes and remedies, procedure for fabric inspection

CO4: Describe the classification of knitted fabrics and explain the working principle of warp and weft knitting machines

CO5: Explain the principles involved in web preparation, bonding and finishing of nonwoven fabrics

TEXT BOOKS:

1. Talukdar M.K., Sriramulu P.K. and Ajgaonkar D.B., "Weaving: Machines, Mechanisms, Management", Mahajan Publishers, Ahmedabad, 1998, ISBN: 81-85401-16-0
2. Marks R. and Robinson T.C., "Principles of Weaving", The Textile Institute, Manchester, 1989, ISBN: 0 900739 258
3. Abhijit Majumdar, Principles of Woven Fabric Manufacturing 1st Edition, Kindle Edition ISBN-13 978-1498759113
4. Spencer D.J.,"Knitting Technology", III Ed.,Textile Institute, Manchester, 2001, ISBN:1855733331.
5. Samuel Raz., "Flat Knitting: The new generation", MeisenbachGmbH, Bamberg,1997, ISBN:3- 87525-054-0.
6. Samuel Raz.,"Warp Knitting production", MelliandTextilberichte, GmbH, Rohrbacher, 1987,ISB: 3-87529-022-4

REFERENCES:

1. PR. Lord and Mohammed, "Weaving: Conversion of yarn to fabric", M.H.Merrine Publishing Co. Ltd., VK, 1998. .
2. W.S. Murphy, "Hand Book of Weaving", Abhishek Publications 2001.
3. AjgaonkarD.B., "Knitting technology", Universal Publishing Corporation, Mumbai,1998, ISBN:0818502738/ISBN:9780818502736
4. Nonwoven Fabrics: Raw Materials, Manufacture, Applications, Characteristics, Testing Processes, Edited by Wilhelm Albrecht , Hilmar Fuchs and Walter Kittelmann, WILEY-VCH Verlag GmbH & Co. KgaA, Weinheim,, ISBN: 3-527-30406-1, 2003

ANNA UNIVERSITY
PROGRESS THROUGH KNOWLEDGE

Course Articulation Matrix:

Course Outcomes	Statement	Program outcome														
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	Describe the objectives and principles of winding, warping machines and the objectives of sizing	3	2	2	1	2	-	-	-	-	1	2	2	3	-	2
CO2	Explain the basic concepts of loom and the working principle of primary, secondary, and auxiliary mechanisms of power loom	3	2	2	1	2	-	-	-	-	1	2	2	3	-	2
CO3	Explain the working principle of dobby, jacquard, and shuttle less looms; Describe the fabric defects, causes and remedies, procedure for fabric inspection	3	2	2	1	2	-	-	-	-	1	2	2	3	-	2
CO4	Describe the classification of knitted fabrics and explain the working principle of warp and weft knitting machines	3	2	2	1	2	-	-	-	-	1	2	2	3	-	2
CO5	Explain the principle involved in web preparation, bonding and finishing of nonwoven fabrics	3	2	2	1	2	-	-	-	-	1	2	2	3	-	2
Overall CO		3	2	2	1	2	-	-	-	-	1	2	2	3	-	2

1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively

FT3004 **FABRIC STRUCTURES** **L T P C**
3 0 0 3

OBJECTIVES:

To teach the structures of basic, simple and compound weaves;
To teach the structures of pile and leno structures; graphing for spot and jacquard figuring;
To teach the different weft knit structures and warp knit structures

UNIT I **9**

Basic Weaves: Plain, Twill, Sateen, Warp Rib, Weft Rib, Mat; Draft and peg-plan of these weaves
Simple Weaves: Wavy Twill, Herring Bone, Diamond, Diaper; Ordinary Honey comb, Brighton Honey comb, Mock-leno, Huck-a-back, Crepe; Colour and weave effect; Draft and peg-plan of basic and simple weaves

Unit II **9**

Compound Weaves: Basic construction of – Plain face Bedford cord, Plain face welt, Twill face Warp Backed, Weft Backed structures; Plain face Extra Warp, Extra Weft structures produced by heald; Twill face self-stitched Double Cloth, Interchanging plain double cloth;

UNIT III **9**

Pile Weaves and Leno: Basic construction of - Warp pile-Velvet, Terry Pile, Weft Pile- Velveteen and Corduroy; Basic Leno structure
Dobby and Jacquard Design: Spot Figure graphing, Steps involved in graphing for figured fabrics, Basics of computer Aided Graph Designing.
Characteristics, Commercial names and end uses of the fabrics woven with different weaves of the course

UNIT IV **9**

Weft knit structures: Representation and characteristics of weft knit fabric structures -Single jersey, Rib, Purl, Interlock. Derivatives of single and double jersey structures: Accordion type of fabrics, plaited fabrics, 2X2 rib structure, half cardigan, full cardigan, eight lock, Ponte-di-Roma, Ottoman rib, Bourrelet, Texi- pique, Pin-tuck, Milano rib, French pique, Swiss pique.

UNIT V **9**

Warp knit structures: Representation and characteristics of warp knit fabric structures. Point Paper, Chain-Link Notation, single fabrics, Chain stitch, Tricot lap, Full tricot, Lock Knit, Reverse Lock Knit, satin, Loop raided fabrics, Queen's cord, Sharkskin, Blind lap, open work effects, Marquisette, sand- flair net, Hexagonal net.
Characteristics, Commercial names and end uses of the fabrics/garments woven with different weft and warp knit structures

TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of this course, the student shall be able to

CO1: Design and describe the construction of basic weaves and simple weaves

CO2: Design and describe the construction of compound weaves

CO3: Design and describe the construction of pile weaves, jacquard designs, and define the commercial names of woven fabrics

CO4: Design and describe the weft knit structures

CO5: Design and describe the warp knit structures and define the commercial names of woven fabrics

TEXTBOOKS

1. Grosicki Z. J., “Watson’s Textile Design and Colour”, Vol.1, Woodhead Publications, Cambridge England, 2004, ISBN: 9781782420088
2. Grosicki Z. J., “Watson’s Advanced Textile Design and Colour”, Vol.II, Butterworths, London, 1989, ISBN: 9781845698522
3. D J Spencer, Knitting Technology: A Comprehensive Handbook and Practical Guide Woodhead Publishing Series in Textiles, 2001, ISBN 1855733331
4. N. Anbumani, Knitting Fundamentals Paperback, New Age International Publisher, 2007, ISBN: 8122419542

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1. W.S. Murphy, “Textile weaving and Design”, Abhishek Publications, 2007, ISBN: 9788182471664
2. H. Nisbet, “Grammar of Textile Design”, Taraporewala and Sons Co. Pvt. Ltd., 1994, ISBN: 1362902470
3. Wilson J., "Handbook of Textile Design", Textile Institute, Manchester, 2001, ISBN: 9781855735736
4. Seyam A. M., "Structural Design of Woven Fabrics, Theory and Practice", Textile Institute, Manchester, 2002, ISBN: 1870372395
5. Georner D, "Woven Structure and Design, part 1: Single Cloth Construction", WIRA, U.K., 1986, ISBN: 0900820179
6. Georner D, "Woven Structure and Design, Part 2: Compound Structures", WIRA, U.K.,1989, ISBN: 090366951X
7. Gokarneshan N., “Fabric Structure and Design”, New Age International (P) Limited, 2009, ISBN: 812241530X
8. Sadhan C. Ray, Fundamentals and Advances in Knitting Technology, Woodhead Publishing India in Textiles, 2015, ebook ISBN: 9780429083815

Course Outcomes	Statement	Program outcome														
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	Design and describe the construction of basic weaves and simple weaves	3	2	2	1	2	-	-	-	-	1	2	2	3	-	2
CO2	Design and describe the construction of compound weaves	3	2	2	1	2	-	-	-	-	1	2	2	3	-	2
CO3	Design and describe the construction of pile weaves, jacquard designs, and define the commercial names of woven fabrics	3	2	2	1	2	-	-	-	-	1	2	2	3	-	2
CO4	Design and describe the weft knit structures	3	2	2	1	2	-	-	-	-	1	2	2	3	-	2
CO5	Design and describe the warp knit structures and define the commercial names of woven fabrics	3	2	2	1	2	-	-	-	-	1	2	2	3	-	2
Overall CO		3	2	2	1	2	-	-	-	-	1	2	2	3	-	2

Course Outcomes	Statement	Program outcome														
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	Describe the objectives and principles of winding, warping machines and the objectives of sizing	3	2	2	1	2	-	-	-	-	1	2	2	3	-	2
CO2	Explain the basic concepts of loom and the working principle of primary, secondary, and auxiliary mechanisms of power loom	3	2	2	1	2	-	-	-	-	1	2	2	3	-	2
CO3	Explain the working principle of dobby, jacquard, and shuttle less looms; Describe the fabric defects, causes and remedies, procedure for fabric inspection	3	2	2	1	2	-	-	-	-	1	2	2	3	-	2
CO4	Describe the classification of knitted fabrics and explain the working principle of warp and weft knitting machines	3	2	2	1	2	-	-	-	-	1	2	2	3	-	2
CO5	Explain the principle involved in web preparation, bonding and finishing of nonwoven fabrics	3	2	2	1	2	-	-	-	-	1	2	2	3	-	2
Overall CO		3	2	2	1	2	-	-	-	-	1	2	2	3	-	2

FT3005 CONCEPTS AND EVOLUTION OF FASHION AND DESIGN L T P C
3 0 0 3

OBJECTIVES:

To introduce briefly the basic concepts of fashion and design to the students.

To acquaint the student with the history of fashion, its elements, traditional costumes of various cultures of the world,

UNIT I **6**

Development of Figured Motif; Forms – Natural, Geometrical, Artificial, and Abstract; Bases – Diamond, Ogee, and Diagonal; Arrangement – Plain, Twill, and Sateen; Principles – Half Drop Straight, and Half Drop Reverse.

Garment design – Classification - structural, decorative and functional.

UNIT II **12**

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 – definition; dimensions of colour-hue, value and intensity; colour harmonies, warm and cool colours; advancing and receding colours; colour theories – Prang colour system and Munsell colour system;.

UNIT III **9**

Fashion fundamentals– definition, tangibles and intangibles of fashion; fashion life cycle; factors influencing fashion; fashion adoption theories.

Fashion terminology -street fashion, recurring fashion, mass fashion, fashion trend, fashion shows, style, chic, boutique, Haute Couture; role of a fashion designer.

UNIT IV **9**

History of world costumes –principle garments and textiles of Egyptian, Greek, medieval English, Renaissance French costumes

History of Indian costumes – Ancient garments during the Mauryan and Guptha period

Traditional Indian costumes - Tamil Nadu, Kerala, Gujarat, Rajasthan, Bengal, Manipur, Jammu & Kashmir, Manipur, Orissa, Maharashtra

UNIT V **9**

Traditional Indian textiles: Motifs, colour combinations and designs of **Hand-woven Textiles** - Banaras Brocades, Jamdani Saris, Paithani Saris, Kanchipuram Saris, Chanderi Saris **Printed Textiles** - Bagru prints from Rajasthan, Kalamkari from Andhra Pradesh. **Embroidered Textiles** - Kashida, Phulkari, Chamba, Rumal, Chikankari, Phool Patti ka Kaam, Zardozi, Kasuti, Kantha, Pipli Applique. **Resist Dyed Textiles** - Bandhani, Bandhej & Lehariya of Rajasthan, Ikat and Patola of Gujarat.

45 periods

OUTCOMES:

Upon the completion of this course, the students shall understand the basic concepts of fashion and design, colour basics, dimensions, categories and their characteristics.

Upon completion of the course, the student would develop an understanding of fashion evolution and fashion designing

TEXT BOOKS:

1. Vandana Bhenderi, “Costume, Textiles and Jewellery of India – Traditions in Rajasthan”,

Prakash Books, New Delhi, 2004.
2. Fillow J and Bernard N Thomas and Hudson, “Traditional Indian Textiles”, Prentice Hall, India,1993.
3. Alkazi, Roshen. *Ancient Indian Costume*. [New Delhi]: Art Heritage, 1983.

REFERENCES:

1. Hart A North S V and A Museum, “Historical Fashion in detail the 17th and 18th Centuries”, McMillan, India, 1998.
2. Kathy Alert, "Traditional folk costumes of Europe paper dolls in full color”, Dover publications, Inc., Newyork,1984.
3. Diane T. and Cassidy T., “Colour forecasting”, Blackwell Publishing, 2005, ISBN: 1405121203 / ISBN: 978-1405121200.
4. Elaine Stone and Jean A. Samples, “Fashion Merchandising”, McGraw-Hill Book Company, 1985, ISBN: 0070617422.
5. Marian L. Davis, “Visual Design and Dress”, Prentice Hall, New Jersey, 1996, ISBN: 0131121294 / ISBN: 978-0131121294.
6. Naik, S. D., Traditional embroideries of India. 1996, APH Publishing.

FT3311 FABRIC STRUCTURE LAB L T P C
0 0 3 1.5

OBJECTIVE:

To train the students in analyzing the cloth to identify construction parameters and prepare design, draft and peg plan.

Analysis of construction details of the following fabric structure

1. Plain and its derivatives
2. Twill and its derivatives
3. Satin & Sateen (Regular and irregular)
4. Honeycomb (ordinary and Brighton)
5. Huck-a-back & Mock-leno
6. Extra warp and extra weft figuring
7. Pile fabrics (warp and weft)
8. Bedford cord &Backed fabrics
9. Gauze and Leno
10. Double cloth
11. Crepe
12. Tapestry
13. Basic Weft knitted strictures
14. Basic Warp knitted structure
15. Basic Non Wovens structures

TOTAL: 60 PERIODS

OUTCOMES:

Upon completion of the lab the student will be able

Identify the constructional parameters of fabric

Construct design, draft and peg plan for weaving the fabric

Analyse the blend composition of yarn used in the fabric and the type of finish applied in the fabric

LAB EQUIPMENTS:

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS

1. GSM Cutter – 3 Nos.
2. Beesley Balance – 2 Nos.
3. Crimp Tester – 2 Nos.
4. Electronic balance – 1 No.

FT3312 FASHION ILLUSTRATION LABORATORY L T P C
0 0 3 1.5

COURSE OBJECTIVES

- To train the students in fashion illustration

LIST OF EXPERIMENTS

1. Motif Development – Design Repeat and positioning.
2. Object Drawing and Shading concepts.
3. Drape of fabrics and shading with different mediums.
4. Preparing swatches for dimensions of colour, different colour theories and harmonies.
5. Rendering prints and textures with various fabric constructions (wovens, non-wovens and knit).
6. Drawing different Silhouettes and garment components - sleeves, collars, necklines, cuffs, skirts, pants.
7. Human Anatomy- Figure basics, Constant proportions, Shapes and parts of human body. Study of different postures- Head- Face, Hand, Leg.
8. Normal Drawing - Eight head theory. Fashion Figure Drawing - Drawing croqui figures-stick, geometric, flesh - 8 ½ and 10 head figures.
9. Different postures of male and female figure - ¾ view, back view, side view. Different poses like – S-Pose, X-Pose, and T-pose.
10. Drawing croqui figures using template, model, imagination and photograph.
11. Create a mood board based on a selected theme.
12. Develop garments on croqui figures (Male and female) deriving inspirations from the developed mood board.

TOTAL: 60 PERIODS

COURSE OUTCOMES

Upon completion of this course, the student would be able to sketch human body, ideal figures and create garment designs.

LIST OF EQUIPMENT REQUIRED FOR 30 STUDENTS

Drawing tables - 15 Nos.

Course Outcomes	Statement	Program Outcome														
		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	PSO 3
CO1	To learn motif development, drawing objects and shading concepts	1	-	1	1	3	1	2	1	1	3	1	2	3	3	3
CO2	To learn drape of fabrics and shading with different mediums.	1	1	1	1	3	1	2	1	1	3	1	2	3	3	3
CO3	To learn how to illustrate different fabric swatches and garment components	1	1	1	1	3	1	2	1	1	3	1	2	3	3	3
CO4	To understand human anatomy and learn how to illustrate basic figures	1	1	1	3	3	1	2	1	3	3	1	2	3	3	3
CO5	To learn how to create a mood board based on a selected theme and develop garment designs	1	1	1	3	3	1	2	1	3	3	1	2	3	3	3
Overall CO		1	1	1	2	3	-	2	-	-	3	1	2	3	3	3

FT3401 APPAREL PRODUCTION MACHINERY L T P C
3 0 0 3

COURSE OBJECTIVES

- To impart knowledge on the machineries and equipments used for garment production
- To instruct on latest developments in the garment production machineries.

UNIT I SPREADING MACHINES 9

Fabric inspection machines, Types of Fabric Packages. Types of Fabrics – One Way – Two Way Fabrics – Their effect on spreading. Methods of Fabric spreading. Types of Spreading machines.Limitations and control parameters in spreading .Marker planning, Marker efficiency, Factors affecting marker efficiency.

UNIT II CUTTING MACHINES 9

Introduction to cutting machines. Types and functions of cutting machines – straight knife, round knife, band knife cutting machines. Notches, drills, die cutting machines. Types of Computerised cutting machines and its functiona advantages. Maintenance &safety measures of cutting machines.

UNIT III SEWING MACHINES 9

Basic parts of sewing machine –primary and auxiliary parts and their functions. Bobbin case / Bobbin hook, Throat plate– Take up devices – Tensioners – Feed dog – Pressure foot. Types of needles – Parts of needles and their function. Needle finishes. Adjustments of Stand height – pedal – Needle Bar – Stitch length selection – Feed timing – Needle and Bobbin Thread Tension – Stitch cycle timing diagram; Classifications of sewing machines ; Basic parts and functions of chain and SNLS sewing machines. Maintenance &safety measures of machines.

UNIT IV MULTI THREAD SEWING MACHINES 9

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 &safety measures of machines.

UNIT V SPECIALISED SEWING MACHINES 9

Special sewing machines – Button hole and button sewimg machines. Parts and their Functions .threading diagram. Rib cutting machine-Zig zag and feed off the arm machine Parts and their functions. threading diagram ; automation in sewing machine; Funtions and merits of computerized sewing machines; usage of special attachments and tools for operation simplifications .Maintenance &safety measures of machines

TOTAL: 45 PERIODS

COURSE OUTCOMES

Upon completion of this course, the student would be able to

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

- Acquire knowledge on special machineries used in apparel production

TEXT BOOKS:

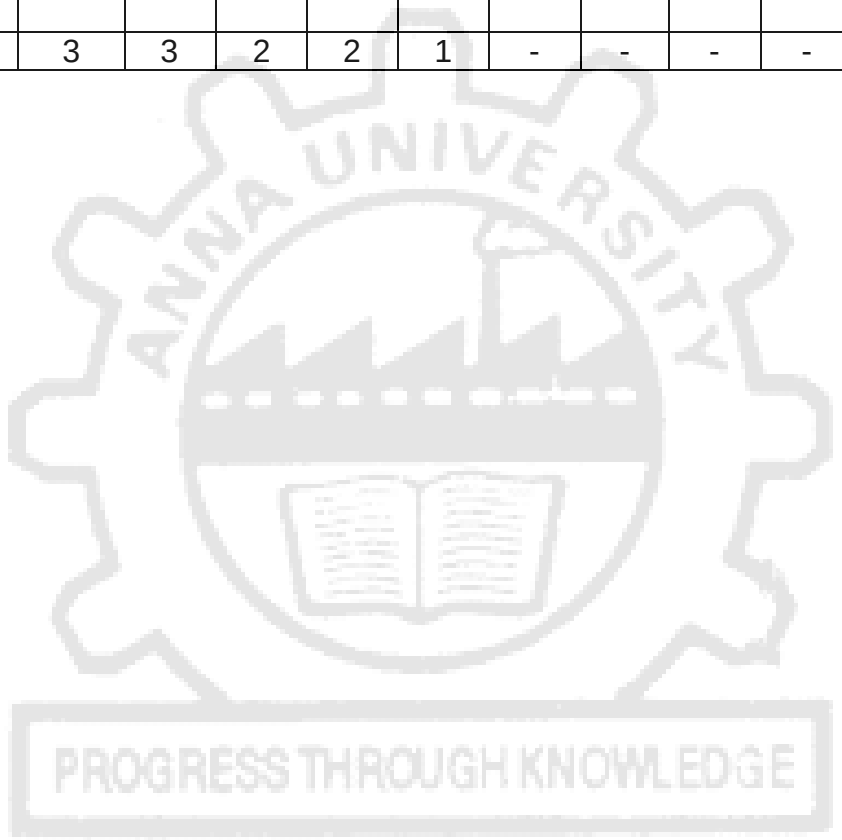
1. Harold Carr and Barbara Latham, The Technology of Clothing Manufacture, Om Book Service, 2002.
2. Shaeffer Claire, Sewing for the Apparel Industry, Prentice Hall, New Jersey, 2001.

REFERENCES:

1. Singer, "Sewing Lingerie", Cy DeCosse Incorporated, 1991.
2. Laing R.M. and Webster J, "Stitches and Seams", The Textile Institute, Manchester, 1999
3. Technical Advisory Committee of AAMA, "A New Look at Apparel Mechanization", 1978.
4. Jacob Solinger, Apparel Production Handbook, Reinhold Publications, 1998.

Course Outcomes	Statement	Program Outcome														
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	Understand different types of fabric laying methods, spreading machines and its control methods	1	3	3	2	2	1	-	-	-	-	-	3	3	3	3
CO2	Understand different types of cutting machines and its control methods	1	3	3	2	2	1	-	-	-	-	-	3	3	3	3
CO3	Introduction to sewing machine and its basic parts, functions and its safety measures	1	3	3	2	2	1	-	-	-	-	-	3	3	3	3
CO4	Introduction to different types of multi thread sewing machines and its purpose	1	3	3	2	2	1	-	-	-	-	-	3	3	3	3

CO5	Understand special sewing machines, its purpose and control measures	1	3	3	2	2	1	-	-	-	-	-	3	3	3	3
Overall CO		1	3	3	2	2	1	-	-	-	-	-	3	3	3	3



FT3402 FABRIC AND GARMENT QUALITY EVALUATION L T P C
3 0 2 4

OBJECTIVE:

To infuse understanding of yarn, fabric and apparel testing methods

UNIT I CONSTRUCTION CHARACTERISTICS & SAMPLING TECHNIQUES 9

Basic fabric particulars – Measurement of ends and picks per inch, count of warp and weft, determination of the type of weave, measurement of length, width, thickness and Area density (GSM); warp and weft crimp measurements for spun and filament yarn fabrics, the cover factor calculations;

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

UNIT II MECHANICAL PROPERTIES 9

Tensile strength measurement – ravelled strip test and grab test – mechanical and electronic measuring systems. Tear strength – importance – measuring systems. Bursting strength and its measurement. Ballistic impact strength. Universal tensile tester - principle and operation. Fabric Abrasion Resistance – Martindale abrasion tester. Fabric Pilling - I.C.I Pillbox tester. Crimp– Influence of crimp on fabric properties–Shirley crimp tester.

UNIT III APPAREL COMFORT AND ACCESSORY TESTING 9

Fabric stiffness – principle of measurement of flexural rigidity; Drapeability – measurement of drape coefficient; Crease recovery measurement techniques. Wrinkle recovery assessment using standard grades; Principle and functioning of air permeability testers, water repellency, contact angle and fabric shrinkage testing.

ACCESSORY TESTING

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

UNIT IV LOW STRESS CHARACTERISTICS 9

Fabric bending hysteresis testing; Shear hysteresis measurements; Fabric compression and decompression behaviour; Fabric surface roughness and friction measurements; Fabric tensile hysteresis measurements; Fabric flame resistance testing methods; Moisture and thermal characteristics.

UNIT V FABRIC AND GARMENT INSPECTION 9

Fabric inspection – 4-point system, 10 point system, classification of fabric defects, independent product quality certification, acceptable quality level, Inspection of garments and garment defects - sewing, pressing, finishing and packaging defects.

TOTAL: 45 PERIODS

OUTCOMES:

The student will have knowledge on

Methods by which the physical and mechanical properties of textile materials and products are measured and investigated

Sampling and yarn quality parameters testing

Fabric and garment quality parameters testing

TEXT BOOKS:

1. Booth J.E., “Principle of Textile Testing”, Butterworth Publications, London, 1989
2. Kothari V. K., “Testing and Quality Management”, Progress in Textile Technology Vol.1, IAFL Publications, New Delhi, 1999
3. Sara J. Kadolph., “Quality Assurance for Textiles and Apparels”, Fair Child Publications, New York, 1998.
4. Apurba Das., and Alagirusamy R., “Science in clothing comfort”, Wood head Publishing India Pvt. Ltd., India, 2010, ISBN: 1845697898 | ISBN-13: 9781845697891.

REFERENCES:

1. Saville,B.P. “Physical Testing of Textiles”, Woodhead Publishing Ltd., England,2004.
2. Grover E G and Hamby D. S “Hand Book of Textile testing and quality Control”, Wiley Eastern Pvt. Ltd., New Delhi, 1969.
3. Ruth clock and Grace Kunz., “Apparel Manufacture – Sewn Product Analysis”, Upper Sadle River Publications, New York, 2000
4. Pradip V. Mehta., “Managing Quality in the Apparel Industry”, NIFT Publication, India, 1998
5. Slater K., “Physical Testing and Quality Control”, The Textile Institute, Vol.23, No.1/2/3 Manchester, 1993
6. Arindam Basu, "Textile Testing-Fiber, Yarn & Fabric", SITRA, India, 2001.

Course Outcomes	Statement	Program Outcome														
		PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	Identification of construction characteristics and sampling methods	3	3	1	2	1	2	1	3	1	1	2	2	1	1	2
CO2	Principle and operation of mechanical characteristics	3	3	1	2	1	2	1	3	1	1	2	2	1	1	2
CO3	Principle and operation of apparel comfort and accessories characteristics	3	3	1	2	1	2	1	3	1	1	2	2	1	1	2
CO4	Principle and operation of low stress and thermal characteristics	3	3	1	2	1	2	1	3	1	1	2	2	1	1	2
CO5	Principle and operation of fabric and garment inspection	3	3	1	2	1	2	1	3	1	1	2	2	1	1	2

Overall CO	3	3	1	2	1	2	1	3	1	1	2	2	1	1	2

Course Articulation Matrix:

1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) andubstantial (High) respectively

LIST OF EXPERIMENTS: **TOTAL: 30 PERIODS**

1. Determination of Yarn Count and Lea Strength
2. Determination of Single / Ply Yarn Twist
3. Determination of Yarn Appearance Grade
4. Determination of Fabric Abrasion Resistance and pilling
5. Determination of Fabric Tensile Strength
6. Determination of Color Fastness to Rubbing - Crock meter
7. Determination of Fabric Stiffness and Crease Recovery Angle
8. Determination of Fabric bursting strength and fabric Drape.
9. Determination of fabric tear strength.
10. Determination of colorfastness to perspiration.
11. Determination of shrinkage of woven and knitted fabrics.
12. Determination of Seam Strength, Seam Slippage, zipper strength, button pull strength
13. Determination of Peel bond strength of fusible interlinings
14. Determination of Wickability and wettability of fabric
15. Determination of Spirality and Course length of Knitted fabrics

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS

- Baer Sorter - 1 No.
- Fibre Fineness tester - 1 No.
- Projection Microscope - 1 No.
- Wrap Reel - 1 No.
- Wrap Block - 1 No.
- Yarn Twist Tester - 1 No.
- Weighing balance - 1 No.
- Yarn appearance Board Winder - 1 No.
- Yarn appearance Board (Standards) - 1 No.
- Fabric tensile strength tester -1 No.
- Fabric tearing strength tester -1 No.
- Fabric Thickness Tester -1 No.
- Fabric Stiffness Tester -1 No.
- Fabric Crease Recovery Tester -1 No.
- Fabric Bursting Strength Tester -1 No.
- Fabric Abrasion Resistance Tester -1 No.
- Fabric Pilling resistance tester -1 No.
- Fabric air permeability tester -1 No.
- Fabric Drape meter -1 No.
- Universal Testing machine - 1 No.
- Spirality Equipment – 1 No
- Seam strength, Slippage, Peel bond, zipper strength, button pull strength Jaws – 1 No

FT3403 FUNDAMENTALS OF GARMENT MANUFACTRING L T P C
3 0 0 3

OBJECTIVES:

To introduce briefly the fundamentals of garment manufacture to the students

UNIT I APPAREL INDUSTRY PROCESS FLOW 9

Introduction to Indian apparel industry. Structure of an apparel industry-work flow, Pre production planning; types of samples and sample approval; Technical pack, Specification sheet – preparation, analysing and approvals. Preparation of proto pattern and developing production pattern.

UNIT II RAW MATERIAL SELECTION 9

Types and applications of garment accessories and trims – Labels, linnings, inter-linnings, waddings, lace, braid, elastic, hook and loop fastners, shoulder pads, eyelets, zip fastners, buttons, rivets. Characteristics of sewing threads, types, construction and seam performance. Stitch types and uses; seam types and uses; Stitches and seam defects

.

UNIT III PATTERN LAYOUT PLANNING 9

Objectives and requirements of fabric inspection, spreading - modes of spreading, different fabric packages, spreading tension, uniformity and alignment. Importance of grain in garment performance. Principles and types of layout and marker planning - woven fabric lay, knitted fabric lay, types of fabric lay and Marker efficiency. Principles of cutting and cut order plan, bundling and numbering. Control parameters and planning for inspection to numbering

UNIT IV PRODUCTION SYSTEMS 9

Production systems- individual system; Factory production system- Progressive Bundle System, Unit Production System , Modular Production System .quality control in swing section, assembly of garment components and operational break down

UNIT V APPAREL FINISHING PROCESS 9

Fusing requirements and process; stain removal process and machine, ironing and pressing process and machines. Packaging – types, functions and suitable machines– types of packaging forms

TOTAL: 45 PERIODS

OUTCOMES:

Upon completion of this course, the students shall understand
Basics structure of apparel industry and production planning
Factors involved in house production process
Primary stitches and seams used in sewing
Various garment accessories and inspection process

TEXT BOOKS:

1. Harrold Carr., and Barbara Latham., “The Technology of Clothing Manufacture” Backwell Science, U.K., 1994,ISBN: 0632037482 | ISBN-13: 9780632037483.
2. Gerry Cooklin., Steven George Hayes., and John McLoughlin., “Introduction to Clothing Manufacture”, Wiley-Blackwell Science, U.K., 2006, ISBN: 0632058463 | ISBN-13:9780632058464.

REFERENCES:

1. Richard M. Jones., “The Apparel Industry”, Blackwell Science, U.K., 2006, ISBN: 1405135999 |ISBN-13: 9781405135993.
2. Kantilal Ila., “Apparel Industry in India”, NICTAS Publication,

Ahmedabad, 1990, ISBN:8185472009 | ISBN-13: 9788185472003.
3. Raj kishore Nayak., and Rajiv Pandhya.,"Garment Manufacturing Technology", Woodhead publications 2015, ISBN: 1782422323 | ISBN-13: 9781782422327.
4. ChutterA. J., "Introduction to Clothing Production Management", Wiley-Blackwell Science, U.K., 1995, ISBN: 0632039396 | ISBN-13: 9780632039395.
5. Harold Carr, "The Clothing Factory", Clothing and Footwear Institute, 1972. ISBN: B0012PP566.
6. Miller E., "Textile Properties and Behaviour in Clothing use", Batsford Publication, 1992, ISBN:0713472359 | ISBN-13: 9780713472356.
7. Cooklin G., "Fusing Technology", The Textile Institute, Manchester, 1990, ISBN: 1870812204 |ISBN-13: 9781870812207.
8. Jay Diamond., "Fashion Apparel and Accessories", Delmar Publication, 1994, ISBN: 0827356242 | ISBN-13: 9780827356245.

FT3404 PATTERN ENGINEERING L T P C
3 0 0 3

COURSE OBJECTIVES

- To enhance the fundamental knowledge in human anthropometrics from the scientific and technological viewpoint
- To equip students with comprehensive pattern making skills

UNIT I STUDY OF BODY MEASUREMENTS AND SIZING SYSTEMS 6

Anthropometry- Human Anatomy, Body Ideals-Eight head theory: body proportions, height and weight distribution. Important body measurements for children, men and women across all age groups - Clothing sizing systems - Methods of measuring body dimensions, Standard measurement chart-designation and control dimensions. Landmark terms.

UNIT II BASICS OF PATTERN MAKING 15

Introduction to pattern making and methods. Functions of pattern making tools, Preparing and Measuring the Form, Pattern making terminologies, Development of pattern - Drafting and draping methods - Basic men's block - bodice, sleeves trousers, and women's block - bodice, sleeves, trousers, skirt.

UNIT III PATTERN ALTERATIONS AND GRADING 6

Pattern alteration for fit, Factors affecting the pattern making process. Grading process, grade rules, and types of grading system.

UNIT IV TECHNIQUES OF PATTERN MAKING 9

Dart manipulation- single dart series-slash-spread technique, pivotal transfer technique. Two dart series- slash spread and pivotal transfer technique. Graduated and radiating darts. Parallel, asymmetric and intersecting darts. Types of added fullness and Contouring Principle.

UNIT V PATTERNS FOR COLLARS AND SLEEVES 9

Collar classification and terms, basic shirt collar, Peter Pan collar, sailor collar, mandarin collar, built-up neck lines, Cowls, Sleeve cap, sleeve cuffs, puff, petal, lantern and leg-of-mutton sleeves.

TOTAL: 45 PERIODS

COURSE OUTCOMES

Upon completion of this course, the student would be able to
CO1: Understand Anthropometry related concepts and important body measurements
CO2: Prepare patterns for basic blocks using drafting and draping techniques
CO3: Develop knowledge on the techniques involved in grading and in pattern alteration
CO4: Apply dart manipulation techniques to design, variation in garment components
CO5: Prepare patterns for basic collar and sleeve components

Course Outcomes	Program Outcome														
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO 11	PO 12	PSO 1	PSO 2	PSO3
CO1	2	2	2	2	3	-	-	-	1	-	-	-	2	-	2
CO2	2	2	2	2	3	-	-	-	1	-	-	-	2	-	2
CO3	2	2	2	2	3	-	-	-	1	-	-	-	2	-	2
CO4	2	2	2	2	3	-	-	-	1	-	-	-	2	-	2
CO5	2	2	2	2	3	-	-	-	1	-	-	-	2	-	2
Overall CO	2	2	2	2	3	-	-	-	1	-	-	-	2	-	2

TEXT BOOKS:

1. Harrold Carr., and Barbara Latham., "The Technology of Clothing Manufacture" Backwell Science, U.K., 1994,ISBN: 0632037482 | ISBN-13: 9780632037483.
2. Gerry Cooklin., Steven George Hayes., and John McLoughlin., "Introduction to Clothing Manufacture", Wiley-Blackwell Science, U.K., 2006, ISBN: 0632058463 | ISBN-13:9780632058464.
3. Helen Joseph Armstrong, "Pattern Making for Fashion Design" Pearson Education (Singapore)Pvt. Ltd.,2005 2. Winifred Aldrich, "Metric Pattern Cutting" Blackwell Science Ltd., 1994

REFERENCES:

1. Gerry Cooklin, "Master Patterns and Grading for Women's Outsizes", Blackwell Scientific Publications, 1995.
2. Gerry Cooklin, "Master Patterns and Grading for Men's Outsize", Blackwell Scientific Publications, 1992.
3. Jeenne Price and Bernard Zamkoff, "Grading Techniques for Modern Design" Fairchild Publications, 1990.
4. Amaden-Crawford Connie, "The Art of Fashion Draping (3rd edition)" Om Books International Publications, 2005
5. Winifred Aldrich, "Metric Pattern Cutting" Blackwell Science Ltd., 1994

FT3405 **TEXTILE CHEMICAL PROCESSING** **L T P C**
3 0 0 3

OBJECTIVES:

To enable the students to learn about pre-treatments involved in the wet processing of textiles, dyeing and printing of textiles

UNIT I PREPARATORY PROCESSES 9

Introduction - Process sequence of wet processing for wovens and knits. Singeing electric and gas singeing. Desizing hydrolytic, oxidative and enzymatic. Scouring alkaline and enzymatic. Bleaching - hypochlorite, peroxide and sodium chlorite bleaching. Optical whitening. Mercerizing tension, tensionless and tubular mercerization.

UNIT II DYEING 9

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

UNIT III PRINTING: 9

Ingredients of print paste. Styles of printing - direct, discharge, resist, tie and dye and batik. Methods of printing - block, stencil, roller, rotary, flat bed, transfer and chest printing. Special prints -flock, foam, foil, glitter, kadi, leather, pearl and rubber. After treatments of printed goods.

UNIT IV FINISHING 9

Mechanical finishing -raising, shearing, sueding, anti-shrink finish, compacting, decatizing, calendaring, embossing. Chemical finishing - softening, crease resist, bio polishing, flame retardant, water repellent, water proof, soil release, antimicrobial, UV protection finish. Denim washing - stone washing, acid washing, sand blasting.

UNIT V COMPUTER COLOR MATCHING CONCEPTS 9

Color; Electromagnetic spectrum - visible range, measurement of color strength - color matching - theory and applications. Spectrophotometer and color matching systems. Quality control using color matching systems, color difference - pass / fail system and shade sorting

`TOTAL: 45 PERIODS

Course Outcomes

CO1	Understand the preparatory process in chemical processing
CO2	Explain the classes, machines, stages, and application of dyes
CO3	Discuss about the ingredients, types and machines and faults of printing
CO4	Understand the various methods and application of finishing
CO5	Understand and measure the strength of colour and colour difference

TEXT BOOKS:

1. Trotman E. R., “Dyeing and Chemical Technology of Textile Fibres”, B.I Publishing Pvt. Ltd., New Delhi, 1994, ISBN: 0471809101 | ISBN-13: 9780471809104
2. Karmarkar S.R., “Chemical Technology in Pre-treatment processes of Textiles”, Elsevier Publications, Newyork,1999, ISBN: 044450060X | ISBN-13: 9780444500601
   Shenai V. A., “Chemistry of Dyes and Principles of Dyeing”, Sevak Publications, Mumbai, 1995, ISBN: B0007BFE9Y
3. Shenai V. A., “Technology of Printing”, Sevak Publications, Mumbai, 1996
4. Miles W. C., “Textile Printing”, Wood head Publication, 2003, ISBN 0 901956 76 1

REFERENCES:

1. Hall A.J., “Textile Finishing”, 2nd ed., McGraw Hill, 1995.
2. Marsh J.T., “Introduction to Textile Finishing” Vol. II, New Age, 1996
3. Heywood D.,”Textile Finishing”, Woodhead Publishing Ltd.,2003 ISBN 090195681
4. Shenai V.A., “Technology of Finishing”, Vol. X, Usha, 1998
5. Schindler W.D and Hauser P., “Chemical Finishing of Textiles”, Wood head Publications, ISBN: 1855739054.
6. Yin-Ling Lam , Chi-Wai Kan & Chun-Wah Marcus Yuen, "Developments in functional finishing of cotton fibres – wrinkle-resistant, flameretardant and antimicrobial treatments", Textile Progress, Vol. 44, Nos. 3 - 4, September-December 2012,175–249.
7. Jones B. W., “Garment Dyeing: Ready to Wear Fashion from the Dyehouse”, Textile Progress, Vol. 19, No. 2, 1988, ISBN 1870812131.
8. Roshan Paul (Ed.), "Denim – Manufacture, Finishing and Applications", Woodhead Publishing, 2015.
9. Reife A. and Freeman H.S., “Environmental Chemistry of Dyes and Pigments”, Wiley, 1996, ISBN: 0471589276

Course Outcomes	Statement	Program Outcome														
		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	PSO 3
CO1	Understand the preparatory process in chemical processing	3	3	2	2	-	-	-	-	3	-	-	2	2	1	2
CO2	Explain the classes, machines, stages, and application of dyes	3	3	2	2	-	-	-	-	2	-	-	2	2	1	2
CO3	Discuss about the ingredients, types and machines and faults of printing	3	2	1	1	-	-	-	-	2	-	-	1	1	1	2
CO4	Understand the various methods and application of finishing	2	3	2	2	-	-	-	-	2	-	-	2	2	-	2
CO5	Understand and measure the strength of colour and colour difference	2	3	2	2	-	-	-	-	3	-	-	2	1	-	2
Overall CO		3	3	2	2	-	-	-	-	3	-	-	2	2	1	2

GE3451 ENVIRONMENTAL SCIENCES AND SUSTAINABILITY L T P C
2 0 0 2

UNIT - I : ENVIRONMENT AND BIODIVERSITY 6

Definition, scope and importance of environment – need for public awareness. Eco-system and Energy flow– ecological succession. Types of biodiversity: genetic, species and ecosystem diversity– values of biodiversity, 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.

UNIT – II: ENVIRONMENTAL POLLUTION 6

Causes, Effects and Preventive measures of Water, Soil, Air and Noise Pollutions. Solid, Hazardous and E-Waste management. Case studies on Occupational Health and Safety Management system (OHASMS). Environmental protection, Environmental protection acts.

UNIT – III: RENEWABLE SOURCES OF ENERGY. 6

Energy management and conservation, New Energy Sources: Need of new sources. Different types new energy sources. Applications of- Hydrogen energy, Ocean energy resources, Tidal energy conversion. Concept, origin and power plants of geothermal energy.

UNIT - IV: SUSTAINABILITY AND MANAGEMENT 6

Development , GDP ,Sustainability- concept, needs and challenges-economic, social and aspects of sustainability-from unsustainability to sustainability-millennium development goals, and protocols-Sustainable Development Goals-targets, indicators and intervention areas Climate change- Global, Regional and local environmental issues and possible solutions-case studies. Concept of Carbon Credit, Carbon Footprint. Environmental management in industry-A case study.

UNIT - V: SUSTAINABILITY PRACTICES 6

Zero waste and R concept, Circular economy, ISO 14000 Series, Material Life cycle assessment, Environmental Impact Assessment. Sustainable habitat: Green buildings, Green materials, Energy efficiency, Sustainable transports. Sustainable energy: Non-conventional Sources, Energy Cycles-carbon cycle, emission and sequestration, Green Engineering: Sustainable urbanization-Socio-economic and technological change.

TOTAL: 30 PERIODS

TEXT BOOKS:

1. Anubha Kaushik and C. P. Kaushik's "Perspectives in Environmental Studies", 6th Edition, New Age International Publishers ,2018.
2. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, 2016.
3. Gilbert M.Masters, 'Introduction to Environmental Engineering and Science', 2nd edition, Pearson Education, 2004.
4. Allen, D. T. and Shonnard, D. R., Sustainability Engineering: Concepts, Design and Case Studies, Prentice Hall.
5. Bradley. A.S; Adebayo, A.O., Maria, P. Engineering applications in sustainable design and development, Cengage learning.
6. Environment Impact Assessment Guidelines, Notification of Government of India, 2006.
7. Mackenthun, K.M., Basic Concepts in Environmental Management, Lewis Publication, London, 1998.

REFERENCE BOOKS:

1. R.K. Trivedi, 'Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards', Vol. I and II, Enviro Media. 38 .
2. Cunningham, W.P. Cooper, T.H. Gorhani, 'Environmental Encyclopedia', Jaico Publ., House, Mumbai, 2001.

3. Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT. LTD, New Delhi, 2007.
4. Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press, 2005.
5. Erach Bharucha "Textbook of Environmental Studies for Undergraduate Courses" Orient Blackswan Pvt. Ltd. 2013.

FT3411 COMPUTER AIDED FASHION DESIGNING LABORATORY **L T P C**
0 0 2 1

COURSE OBJECTIVES

- To train the students in CAD used for designing of garments.

LIST OF EXPERIMENTS

1. Introduction to tools and workspace of image editing software & vector software
2. Development of motifs suitable for printed textile and woven textile
3. Development of woven fabrics designs – plain, twill, satin and denim
4. Development of technical diagrams –T-shirt and trousers
5. Illustration of Kid's romper (all over print)
6. Illustration of Kid's frock (lace)
7. Illustration of Men's T-shirt with a chest print design
8. Illustration of Men's Basic formal shirt (checks and plaids)
9. Illustration of Men's Basic trouser (solid combos)
10. Illustration of Women's long dress (all over print)
11. Illustration of children's school uniform.
12. Illustration of Women's maternity wear with functionality.

TOTAL: 60 PERIODS

COURSE OUTCOMES

Upon completion of this course the student will have practical experience on garment designing and illustrating the same.

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS

Computer with image editing software and sketching software - 15Users.

Color Printer - 01No.

Course Outcomes	Statement	Program Outcome														
		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	PSO 3
CO1	To learn how to develop textile print design	1	1	1	1	3	-	-	-	2	2	2	3	3	2	3
CO2	To learn how to develop fabric design	1	1	1	1	3	-	-	-	2	2	2	3	3	2	3
CO3	To learn how to develop technical drawings	1	1	1	1	3	-	-	-	2	2	2	3	3	2	3
CO4	To learn how to illustrate different kid's garments	1	1	1	1	3	-	-	-	2	2	2	3	3	2	3
CO5	To learn how to illustrate different men's and women's garments	1	1	1	1	3	-	-	-	2	2	2	3	3	2	3
Overall CO		1	1	1	1	3	-	-	-	2	2	2	3	3	2	3

FT3412 BASICS OF PATTERN MAKING AND GARMENT CONSTRUCTION LABORATORY

L	T	P	C
0	0	3	1.5

COURSE OBJECTIVES

- To train the students in pattern making of apparels.
- To train the students in fundamentals of garment construction.

LIST OF EQUIPMENTS

1. Measuring the dress form kid's, male and female.
2. Drafting and grading the basic pattern set for kid's top, male shirt and female top.
3. Drafting and grading the basic pattern set for kid's bottom, male trouser and female skirt & trouser
4. Techniques of pattern making (slash and spread, pivoted technique)
5. Developing basic patterns using Draping methods – Bodice, Bodice with dart variations, Sleeve
6. Developing patterns using Draping methods – Skirt, Cowl Necklines
7. Developing patterns using Draping methods – Men's trousers
8. Preparing samples for stitches – slip basting, slip stitch, running, back, overcasting, hemming, even basting,
9. Preparing samples for seams and seam finishes – Plain seam, double top stitch seam, lapped seam, slot seam, French seam, flat felt seam, pinked finish, edge stitched finish.
10. Preparing samples for Fullness - Darts, Tucks, Pleats, Gathers
11. Preparing samples for Necklines – Bias facing, Bias Binding and Fitted facing
12. Preparing samples for plackets – Continuous Bound Placket, Two Piece Placket, Fly Opening.

TOTAL: 60 PERIODS

COURSE OUTCOMES

Upon completion of this practical course, the student would have practical experience on

- Pattern making of garments
- Develop samples using various stitch classes and seams.
- Develop various garment components.

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS

Working surface – pattern making / cutting table (polished or laminated top)	– 5 Nos.
Rulers – 12" and 36"	– 15 Nos.
Tailor's square – 24" x 14"	– 15 Nos.
Curve rules – French curves, hip curves and vary form curve	– 15 Nos.
Pattern notcher, tracing wheel, awl	– 5 Nos.
Measuring tape	– 30 Nos.
Pattern weights	– 10 Nos.
Dress forms (Full and Half) – Men, Women and children	– 1 set each
High speed industrial sewing machines	
Single needle lock stitch machine	–15 Nos.

Course Outcomes	Statement	Program Outcome														
		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	PSO 3
CO1	To learn how to take basic body measurements and then drafting and grading of basic patterns	3	2	3	2	2	-	-	-	2	-	2	3	3	3	3
CO2	To learn the different techniques of pattern making and prepare different patterns	3	2	3	2	2	-	-	-	2	-	2	3	3	3	3
CO3	To understand and learn the draping method and prepare different patterns	3	2	3	2	2	-	-	-	2	-	2	3	3	3	3
CO4	To learn how to prepare samples for seams and stitches	3	2	3	2	2	-	-	-	2	-	2	3	3	3	3
CO5	To learn how to prepare samples for fullness, necklines and plackets	3	2	3	2	2	-	-	-	2	-	2	3	3	3	3

Overall CO	3	2	3	2	2	-	-	-	2	-	2	3	3	3	3

FT3413 TEXTILE CHEMICAL PROCESSING LABORATORY **L T P C**
0 0 3 1.5

OBJECTIVES:

To train the students in pre-treatment and wet processing of textile materials

LIST OF EXPERIMENTS

1. Identification of fibres
2. Analysis of blend composition in the yarn of the fabric
3. Desizing and scouring of cotton fabric.
4. Peroxide Bleaching of Cotton Yarn/Fabric.
5. Degumming of silk.
6. Identification of dyes
7. Dyeing of Cotton using Reactive & Vat dyes.
8. Dyeing of silk yarn / fabric with acid dyes
9. Dyeing of polyester using disperse dyes.
10. Dyeing of polyester and cotton blend
11. Determination of wash, light, perspiration and rubbing fastness of dyed fabrics.
12. Printing of cotton fabric using direct style.
13. Water proof and Flame retardant finishing of cotton.
14. Resin and softener finishes.
15. Analysis and interpretation of spectrophotometer data for dyed fabrics

TOTAL: 45 PERIODS

Course Outcomes

CO1	Investigate and identify fibers and dyes
CO2	Acquiring knowledge on bleaching, dyeing and printing process
CO3	Estimation and application of chemicals and dyes for processing the textile materials
CO4	Apply the different types of finishes for the chemical processing
CO5	Evaluate on fastness properties of dyed materials.

LAB EQUIPMENTS

LIST OF EQUIPMENT FOR BATCH OF 30 STUDENTS

1. Stainless vats (500 ml) -30 Nos.
2. Water bath -2 Nos.
3. Stirrer -1 No.
4. Steam ager -1 No.
5. Pilot padding mangle -1 No.
6. HTHP Beaker dyeing machine -1 No.
7. Pilot curing chamber -1 No.
8. Fastness tester for Washing, Light, Perspiration & Rubbing -1 No.
9. Printing table -1 No.

Course Outcomes	Statement	Program Outcome														
		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	PSO 3
CO1	Investigate and identify fibers and dyes	2	1	1	2	3	-	-	-	3	-	-	-	3	1	2
CO2	Acquiring knowledge on bleaching, dyeing and printing process	2	1	1	2	3	-	-	-	3	-	-	-	2	1	1
CO3	Estimation and application of chemicals and dyes for processing the textile materials	2	1	1	2	3	-	-	-	3	-	-	-	2	1	1
CO4	Apply the different types of finishes for the chemical processing	2	1	1	2	3	-	-	-	3	-	-	-	2	1	1
CO5	Evaluate on fastness properties of dyed materials.	2	1	2	2	3	-	-	-	3	-	-	-	3	1	1
Overall CO		2	1	1	2	3	-	-	-	3	-	-	-	2	1	1