M. Sc. Textiles and Apparel Design

Syllabus

UNIVERSITY DEPARTMENT

Program Code: TEXA

2020 – 2021 onwards

BHARATHIAR UNIVERSITY

(A State University, Accredited with "A" Grade by NAAC,
Ranked 13th among Indian Universities by MHRD-NIRF,
World Ranking: Times -801-1000,Shanghai -901-1000, URAP - 982)

Coimbatore - 641 046, Tamil Nadu, India

Program Educational Objectives (PEOs)	
After undergoing the M.Sc. Textiles and Apparel Design programme students will be able to	
PEO1	Become a successful apparel designer by exploring the current market trends globally and to communicate effectively with the society by designing, marketing and visual presentations.
PEO2	Apply domain knowledge in Textiles to create innovative products for specific requirements following global standards and professional ethics.
PEO3	Develop eco-friendly textile products in support of environmental sustainability.

Program Specific Outcomes (PSOs)	
After the successful completion of M.Sc. Textiles and Apparel Design program, the students are expected to	
PSO1	Gain knowledge in selection, identification of fibers, yarn and fabrics for various end uses.
PSO2	Be well trained to work in Garment Industry as production operator or merchandiser.
PSO3	Gain hands on experience in selection of dyes, printing, finishing which will help the students to work in wet processing unit or they can start their own Entrepreneur work.
PSO4	Gain knowledge on technical textiles that will help students towards designing smart, innovative apparels for various applications from sportswear to protective clothing.
PSO5	Ability to test and assess quality parameters of various textile materials as per the global standards at Testing Laboratories.
PSO6	Gain knowledge on CAD application that will help students to design patterns fit for Individuals looking into current fashion trends.
PSO7	Gain knowledge in Research that will help students to create newer designs suitable for present scenario, and current market trends.
PSO8	Apply knowledge about Eco textiles which will help in Selection of right eco fabrics, prints and finishes to save environment.
PSO9	Gain knowledge on quality standards implementation and quality requirements for apparel industry make them suitable to work as quality manager.

Program Outcomes (POs)	
On successful completion of the M. Sc. Textiles and Apparel Design program	
PO1	**Domain knowledge**: Apply the specialized knowledge of textile science to find solution for complex scientific problems related to Textile and Apparel Industry.
PO2	**Problem analysis & innovative solution**: Identify, formulate, review of research literature and analyze complex problems of textiles.
PO3	**Design/development of solutions**: Design solutions for industry needs considering the public health and safety, culture, society and the environment.
PO4	**Conduct Research on complex problems**: Use research-based knowledge including design of experiments, interpretation of data and synthesis of information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, modern technology and IT tools including prediction and modeling to complex scientific activities with an understanding of the limitations.
PO6	**Textile Industry and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional practice
PO7	**Environment and sustainability**: Understand the impact of the scientific and technological solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development pertaining to apparel industry.
PO8	**Individual and team work for project management and finance**: Function effectively as an individual, and as a member or leader in diverse teams, to manage projects in textile and apparel industry.
PO9	**Communication**: Communicate effectively with all the stake holders of textile, apparel industry and the society at large, such as, being able to comprehend and write effective reports, design documentation, make effective presentations and give and receive clear instructions.
PO10	**Life-long learning**: Recognize the need, prepare and engage in independent, life-long learning in the broadest context of technological change in Apparel Industry.

BHARATHIAR UNIVERSITY, COIMBATORE - 641 046
M. Sc. Textiles and Apparel Design Curriculum (University Department)
(For the students admitted during the academic year 2020 – 21 onwards)

Course Code	Title of the Course	Credits	Hours / Week		Maximum Marks		
			Theory	Practical	CIA	ESE	Total
FIRST SEMESTER							
13A	CORE–I Fundamentals of Textile Science and Apparel Designing	4	4	-	25	75	100
13B	CORE – II Technical Textiles	4	4	-	25	75	100
13C	CORE – III Apparel Production Technology	4	4	-	25	75	100
13P	PRACTICAL -I Innovative CAD Designing	3	-	5	30	45	75
13Q	PRACTICAL -II Advanced Draping	4	-	5	40	60	100
1EA	Fashion Concepts and Designing	4	4	-	25	75	100
1EB	Textile Apparel Marketing and Merchandising						
1EC	Applied Physics and Chemistry						
	Supportive I Offered by other Departments	2	2	-	12	38	50
	Mentor/Library/Seminar/ Test	-	2	-	-	-	-
	Total	**25**	**20**	**10**	**182**	**443**	**625**
SECOND SEMESTER							
23A	CORE -IV Advanced Wet Processing	4	4	-	25	75	100
23B	CORE-V Research Methodology & Statistics	4	4	-	25	75	100
23C	CORE -VI Textile Testing	4	4	-	25	75	100
23P	PRACTICAL –III Textile Testing	4	-	5	40	60	100
23Q	PRACTICAL –IV- Advanced Garment Construction	4	-	5	40	60	100
2EA	Social and Psychological Aspects of Clothing	4	4	-	25	75	100
2EB	Textile Industry and Management						
2EC	Textile Biotechnology						
	Supportive II Offered by other Departments	2	2	-	12	38	50

	Mentor/Library/Seminar/ Test	-	2	-	-	-	-
	Total	**26**	**20**	**10**	**192**	**458**	**650**
THIRD SEMESTER							
33A	CORE- VII Apparel Quality Standards and Implementation	4	4	-	25	75	100
33B	CORE -VIII Clothing Appearance and Fit	4	4	-	25	75	100
33C	CORE -IX Eco Textiles and Sustainability	4	4	-	25	75	100
33P	PRACTICAL -V Surface Enrichment and Accessory Making	3	-	5	30	45	75
33Q	PRACTICAL -VI Portfolio Presentation	4	-	5	40	60	100
3EA	Clothing Care and Maintenance	4	4	-	25	75	100
3EB	Home Textiles						
3EC	Nanotechnology in Textiles						
37V	Internship Report and Viva Voce *	2	-	-	50	-	50
	Supportive III Offered by other Departments	2	2	-	12	38	50
	Mentor/Library/Seminar/ Test	-	2	-	-	-	-
	Total	**27**	**20**	**10**	**232**	**443**	**675**
FOURTH SEMESTER							
43P	Practical -VII CAD in Textile Designing	4	-	5	40	60	100
47V	Project work & Viva voce	8	-	-	160	40	200
	Mentor/Library/Seminar/ Test	-	2		-	-	-
	Total	**12**	**2**	**5**	**200**	**100**	**300**
	Grand Total	**90**	**62**	**35**	**806**	**1444**	**2250**
ONLINE COURSES							
	SWAYAM MOOCS**	Min 2					
	Job Oriented Certificate Courses**	4					
	Value Added Courses**	2					

*** Internship for 15 days after II Semester**
****Additional Credits will be included in the Mark sheets**

ELECTIVE PAPER with effect from 2020-2021

	SEMESTER – I	SEMESTER – II	SEMESTER – III
A DESIGNING	Fashion Concepts and Designing	Social and Psychological Aspects of Clothing	Clothing Care and Maintenance
B INDUSTRY & MARKETING	Apparel Marketing and Merchandising	Textile Industry and Management	Home Textiles
C RESEARCH	Applied Physics and Chemistry	Textile Biotechnology	Nanotechnology in Textiles

Supportive papers offered to other Department students:

Subject Code	Title of the Paper	Semester	Credits	Instructional Hours/week	Internal	External	Total Marks
GS88	Clothing Care	I	2	2	12	38	50
GS113	Sustainable Fashion	II	2	2	12	38	50
GS17	Fashion Concepts	III	2	2	12	38	50

Job Oriented Certificate Courses

Title of the Paper	Credits	Instructional Hours	Internal Marks		
			Theory	Practical	Total
Fashion Designer	4	60	40	60	100
Assistant Designer - Home Furnishing	4	60	40	60	100

Value added Courses

Title of the Paper	Credits	Instructional Hours	Internal Marks		
			Theory	Practical	Total
Ayurvastra	2	40	20	30	50
Aari Embroidery	2	40	20	30	50
Mural Painting	2	40	20	30	50
Kalamkari	2	40	20	30	50

Eligibility for Admission

A pass in B.Sc. Costume Design and Fashion / Textiles and Apparel Design / Textiles and Fashion Design / Textile and Clothing or any B.Sc or B.Voc. degree related to Textiles or Fashion or Apparels, B.Sc. Home Science / Physics / Chemistry / Botany / Zoology / Microbiology / Biotechnology / Biochemistry and allied subjects.

Internship & Viva Voce

After completion of first and second semesters of study the students have to undergo Internship for a period of 15 days minimum and Internship report has to be submitted. The Internship report is evaluated by the class Tutor and countersigned by the HOD. This report must be presented by the candidate and reviewed by class Tutor and HOD during Viva Voce Examination.

Industrial Visit

Students are encouraged for an Industrial / Institutional visit and have to submit report for evaluation.

Project work & Viva Voce

The project thesis is the bonafide work carried out by the candidate under the guidance of a faculty authenticated and countersigned by the HOD. This project work must be presented and defended by the candidate and reviewed by external examiner during Viva Voce Examination.

Mark Allotment

The M.Sc. Textiles and Apparel Design theory, practical and supportive courses have the following components:

1. Theory

Maximum Marks – 100 (credits – 4)

Internal Marks: 25

Test	- 15 Marks
Assignment	- 5 Marks
Seminar	- 5 Marks

External Marks: 75

Question paper pattern

Section A - 10x1=10 Marks (Question No. 1 to 10)

Choose the correct Answer. Answer all questions. All questions carry equal marks.

Section B – 5x5 = 25 Marks (Either or type – Question No. 11 to 15)

Answer all questions. All question carry equal marks. Each answer should not exceed 2 pages.

Section C – 5x8 = 40 Marks (Either or type – Question No. 16 to 20)

Answer all questions. All Question carry equal marks. Each answer should not exceed 4 pages.

2. Practical

I) For 4 Credits Maximum Marks = 100

Internal Marks 40 + External Marks 60 = 100 (Total)

Internal Marks 40

Test – 10Marks
Model – 10Marks
Record - 20Marks

Total = 40 Marks

External Marks 60

Experiment & procedure / calculations – 60 marks

II) For 3 Credits Maximum Marks = 75

Internal Marks 30 + External Marks 45 = 75 (Total)

Internal Marks 30

Test – 10Marks
Model – 10Marks
Record - 10Marks

Total = 30 Marks

External Marks 45

Experiment & procedure / calculations – 45 marks

3. Supportive Papers (credits – 2)

Maximum Marks – 50

Internal Marks: 12

Test - 6 Marks

Assignment - 3 Marks

Seminar - 3 Marks

External Marks: 38

Question paper pattern

Section A – 5x1=5 Marks (Question No. 1 to 5)

Choose the correct Answer. Answer all questions. All questions carry equal marks.

Section B – 3x3 = 9 Marks (Either or type – Question No. 6 to 8)

Answer all questions. All Question carry equal marks. Each answer should not exceed 1 page.

Section C – 4x6 = 24 Marks (Either or type – Question No. 9 to 12)

Answer all questions. All Question carry equal marks. Each answer should not exceed 2 pages.

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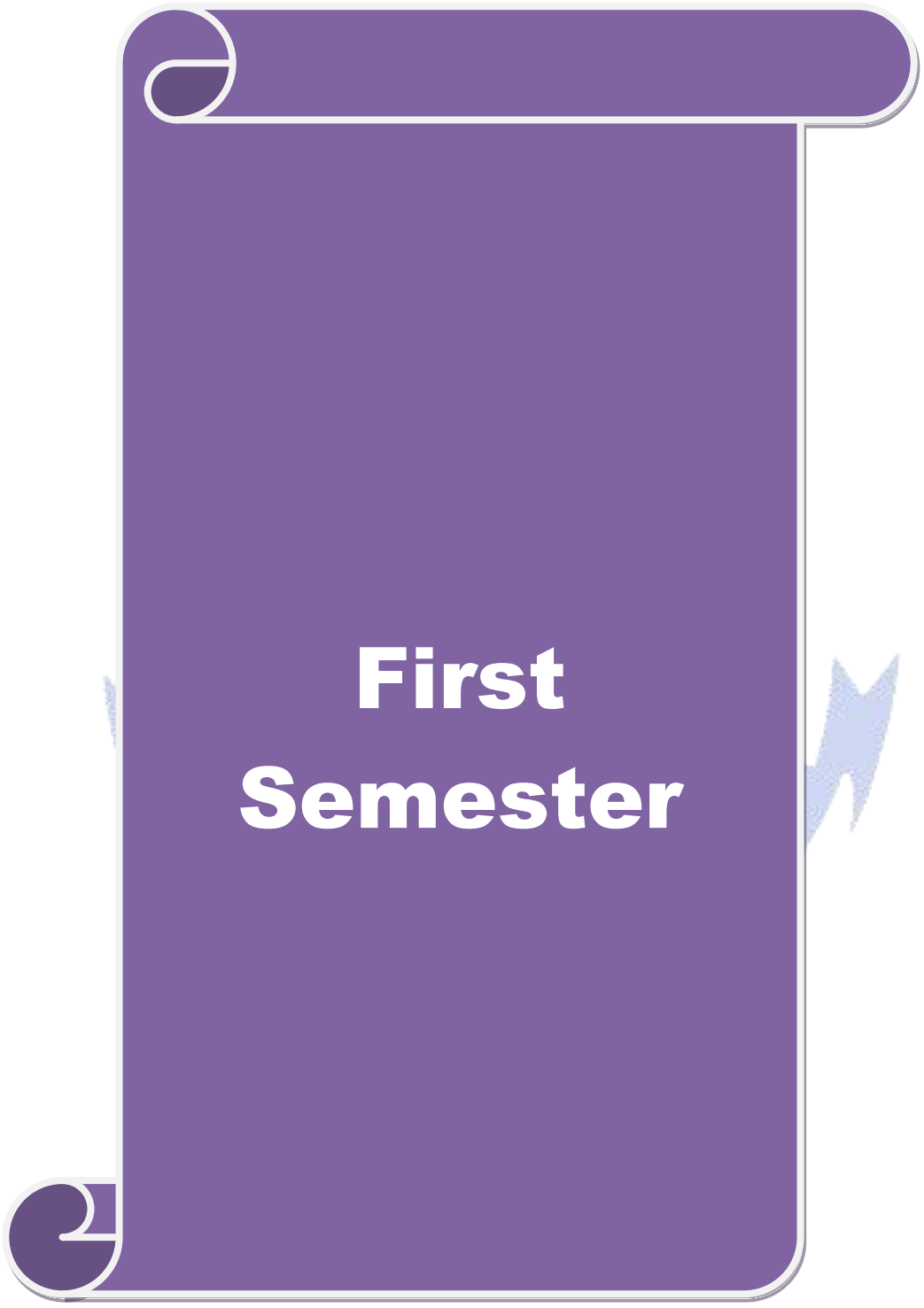
CO-SCHOLASTIC COURSES							
ONLINE COURSES							
	Swayam, MOOC Course etc.,	2	-	-	-	-	-
VALUE ADDED COURSES							
	Value Added Course - I	2	30	-	50	-	50
	Value Added Course - II	2	30	-	50	-	50
CERTIFICATE COURSES							
	Certificate Course - I	4	30-40	-	100	-	100
	Certificate Course - II	4	30-40	-	100	-	100
The scholastic courses are only counted for the final grading and ranking. However, for the award of the degree, the completion of co-scholastic courses is also mandatory.							


First
Semester

Course code	13A	FUNDAMENTALS OF TEXTILE SCIENCE AND APPAREL DESIGNING	L	T	P	C
Core			4	-	-	4
Pre-requisite		Basic knowledge about Fundamentals of Textile science and Apparel Designing	Syllabus Version	2020-2021		

Course Objectives:

The main objectives of this course are to:

1. Study about Natural fiber, Man-made fibers.
2. Learn about Yarn Manufacturing
3. Fabric forming by Weaving , knitting and Non Woven Methods
4. Gain knowledge about seams, plackets
5. Acquire knowledge about Methods of Pattern making

Expected Course Outcomes:

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

1	Name Natural fiber and its Classifications in detail	K1
2	Understand Yarn manufacturing and various methods	K2
3	Analyze Fabric manufacturing by Weaving, knitting and Non Woven	K4
4	Apply seams, plackets and collars	K3
5	Understand about Methods of Pattern making	K2

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create

Unit:1	Textile Fibers	12 hours

Textile fibers: Natural fibers-Cotton, linen, wool, jute and silk. Man-made fibers –Polyester, Nylon, Tencel, viscose. lycra, acrylic, Uses and properties of fibers. Latest development in textile fibers

Unit:2	Yarn Manufacturing	12 hours

Yarn Manufacturing: Yarn manufacturing process**,** classification of yarns and its uses, sewing threads-uses, classification, finishes, characteristic and qualities.

Unit:3	Fabric Manufacturing	12 hours

Weaving: Looms and its classification, Basic weaves and its variation, Latest Techniques in fabric manufacturing, 3D Spacer fabrics.

Knitting: Types of knitting-weft knitting-single jersey, purl, rib, interlock .Warp knitting-Tricot and Raschel. Uses and Properties.

Non-Woven: Non-woven production cycle, Classification of non-woven fabrics, Finishing Methods, Laminates, Bonding and Flocking

Unit:4	Fundamentals of Apparel Production	10 hours

Fundamentals of Apparel Production-Parts and functions of a single needle machine, Seam and Seam finishes, Plackets ,Collars, Pockets, Sleeves and Skirts

Unit:5	Pattern Making	12 hours

Pattern making -Important and principles of taking Body measurements, Methods of pattern making –

Drafting, draping and Flat pattern techniques, Types of paper patterns -Patterns for personal measurements and commercial patterns, Principles of pattern drafting. Layout and its types. Economy of fabric in placing patterns, Adjusting fabrics to patterns. Design and construct any one garment.		
Unit:6	**Contemporary Issues**	**02 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**60 hours**

Text Books	
1	Textile Science, E.P.G. Gohl and L.D. vilensky, 2nd Ed., Guilford, 1984.
2	Technology of short – staple spinning, W.D. Klein,Textile Institute, Manchester, 1998.
3	Principles of weaving, R.Mark and A.T.C Robinson,Textile institute Manchester, 1986.
4	Mechanism of Weaving, N.N. Banner.J. I Vol – I &II Textile Institute, Fairchild, 1990.
5	Handloom weaving technology, Fannin, Allen .A, Green editorial, 1998.
6	Handbook of Nonwovens, 1st edition, S.Russell, Woodhead, 2006.
7	Zarapkar System of cutting, Zarapkar Tailoring College, Navneet, 2010.
8	Practical clothing construction -part I and part-II, Mary Mathews, cosmic press Chennai. 1986
Reference Books	
1	Introduction to Textile Fibers, H.V.S Murthy,WPI,2016
2	Textile Science and clothing technology, Subramanian Senthilkannan Muthu, Springer 2020
3	E.P.G. Gohl, L.D. Vilensky, Textile science, Longman Cheshire Pty Limited, 1983
4	Textiles: Pearson New International Edition, Kadolph S J Pearson Education Ltd, 2013
5	Textbook of Textiles and Clothing, Vatsala, R,Indian Council of Agriculture Research, 2003
6	Textbook of Fabric Science-Fundamentals to Finishing, seems sekhri, PH I Learning Private Limited, 2011.
7	The principles of knitting: Methods and techniques of hand knitting. Hiatt, June Hemmons, Simon & Schuster, 2012.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://nptel.ac.in/courses/116/102/116102026/
2	https://sctevtodisha.nic.in/wp-content/uploads/2019/07/3RD-sem-syallbus-Textile-Tech.pdf
3	https://swayam.gov.in/nd2_cec19_te01/preview
4	http://eacharya.inflibnet.ac.in/data-server/eacharya-documents/53e0c6cbe413016f234436ed_INFIEP_8/9/ET/8_ENG-9-ET-V1-S1__lesson.pdf
5	https://textilelearner.blogspot.com/2020/01/important-questions-and-answers-about.html
6	https://www.craftyarncouncil.com/standards/yarn-weight-system
7	https://www.slideshare.net/prafullnik/yarn-manufacturing-process-carding

8	https://www.youtube.com/watch?v=U1bk4ZI0Qvc
9	http://ugcmoocs.inflibnet.ac.in/ugcmoocs/view_module_ug.php/145

Course Designed By: Dr.M.Sumithra

Mapping with Programme Outcomes										
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	M	S	M	S	S	M	S	S	M	S
CO2	S	S	M	S	M	S	M	S	M	L
CO3	S	S	S	S	M	S	S	S	M	S
CO4	S	S	S	S	S	S	S	S	S	M
CO5	S	S	S	M	S	S	S	S	S	S

*S-Strong; M-Medium; L-Low

Course code	13B	TECHNICAL TEXTILES	L	T	P	C
Core			4	-	-	4
Pre-requisite		Basic knowledge about Textile science	Syllabus Version		2020-2021	

Course Objectives:

The main objectives of this course are to:

1. Learn about fibers and methods used for the production of Technical Textiles
2. Learn in detail about the classifications of Technical Textiles
3. Learn about the application of the Technical Textiles in various fields

Expected Course Outcomes:

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

1	Identify textile fibers used in technical textiles products	K1
2	Understand the various applications of Technical Textiles	K2
3	Apply their knowledge about contribution of technical textiles in various fields	K3
4	Analyse the different types of technical textiles products in the market.	K4
5	Design products for the application of technical textile products in the industry.	K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	Technical Textiles	10 hours

Definition, Classification, Applications, Globalization and Future of Technical Textiles industry. **Technical Fibers:** High – Strength and high-modulus organic fibers, High chemical and combustion - resistant organic fibers, High performance inorganic fibers, Ultra-fine and novelty fibers.

Unit:2	Medical Textiles & Agro Textiles	12 hours

Medical Textiles: Introduction, Fibers used, Properties, Classification- Non – Implantable, Implantable, Extra corporal devices, Health care /Hygiene Products and Applications. Wearable assistants for mobile health monitoring.

Agro Textiles – **-** Introduction, fibers used Types, functions and properties, Characteristics and Applications in Agro products and in its field

Unit:3	Build Tech & Geo Textiles	12 hours

Build Tech: - Introduction, fibers used Types, functions and properties, Characteristics and Applications in Architecture and in Building Construction.

Geo textiles: - Introduction, fibers used Types, functions and properties, Characteristics and Applications in its field

Unit:4	Protective Textiles & Indu Tech	12 hours

Protective Textiles: Introduction, fibers used Types, functions and properties, Characteristics and Applications Fire Protective clothing, Heat – resistant garments, Water proof materials, Ballistic resistant Vests, Biological and chemical Vests, Military Protective clothing. Smart polymers used

in Protective clothing.

InduTech - Introduction, fibers used Types, functions and properties, Characteristics and Applications in its field.

Unit:5	Sports Textiles, Smart and Intelligent Textiles	12 hours

Sports Textiles: Introduction, fibers used, Types, functions and properties, Characteristics and Applications of Sports Tech.

Smart and Intelligent Textiles – Classification - Active smart, passive smart and very smart textiles and - Phase change materials, shape memory polymers, chromic and conductive Materials and its applications in various Wearable technology.

Unit:6	Contemporary Issues	02 hours
Expert lectures, online seminars - webinars		
	Total Lecture hours	**60 hours**

Text Books

1	Hand book of Technical textiles, A. R. Horrocks and S. C. Anand, Wood head publishing ltd, England, 2000
2	Technical Textiles and its Application , Dr.S.Grace Annapoorani , LASER Park Publishing House, India, 2017
3	Textiles for Industrial Applications, R Senthil Kumar, CRC Press, 2013

Reference Books

1	Textile Fibers: Developments and Innovations, Kothari, V., New Delhi: IAFL Publications, 2000.
2	Handbook of Industrial Textiles, Sabit Adanur, Wellington Sears CRC Press ,1995
3	Agro Textiles and its Application, Dr.S.Grace Annapoorani, Wood head publishing ltd, India , 2018

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	http://ugcmoocs.inflibnet.ac.in/ugcmoocs/view_module_ug.php/130
2	https://www.textile Learner blogspot.con
3	https://textilelearner.blogspot.com/2020/03/nfc-embedded-smart-textiles.html
4	https://www.technical-textiles.net
5	https://www.sciencedirect.com/topics/materials-science/smart-textiles

Course Designed By: Dr.S.Grace Annapoorani

Mapping with Programme Outcomes										
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	S	S	S	S	S	S	L	S
CO2	S	S	S	S	M	S	S	S	L	S
CO3	S	S	S	M	S	S	S	S	L	S
CO4	S	M	S	M	M	S	S	S	M	S
CO5	S	M	S	S	S	S	S	S	M	S

*S-Strong; M-Medium; L-Low

Course code	13C	APPAREL PRODUCTION TECHNOLOGY	L	T	P	C
Core			4	-	-	4
Pre-requisite		Basic knowledge about apparel industry	Syllabus Version	2020-2021		

Course Objectives:

The main objectives of this course are to:

1. Give an overview of apparel manufacturing industry.
2. Familiarize students about apparel production processes and finishing.
3. Explain about apparel production planning and control.

Expected Course Outcomes:

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

1	Understand complete functioning of apparel manufacturing industry.	K2
2	Analyze apparel production processes.	K4
3	Analyze finishing and packing.	K4
4	Understand apparel production planning and control.	K2
5	Evaluate plant loading and capacity planning	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	Apparel Manufacturing Industry	12 hours

Nature and Scope. Major functions of apparel manufacturing - Engineering and Management functions. Material flow in apparel industry. Basic types of apparel production process: Make through system, Group system, Whole garment production system, Assembly line system – Progressive bundle system and Unit production system. Apparel trade associations – AEPC, TEA, GEA, AHEA, CMAI, CAA, AEMA. Artificial Intelligence (AI) and its application in apparel industry. Cloud computing in apparel industry.

Unit:2	Spreading, Cutting and Sewing	12 hours

Apparel Production Processes: Introduction to Garment Cutting, Marker Planning, Efficiency of Marker, Methods of Marker Planning, Spreading of the fabric to form a lay, Spreading Requirements, Methods of Spreading, Fabric Packages, Objectives of Cutting, and Methods of Cutting. Automation in spreading, cutting and sewing. Robotics for 3D sewing operations.

Seam & Stitch: Introduction to Seam and Stitch, Stitch Classification, Stitch Structure, Seam Formation, Joining Material, Surface Characteristics, Seam Appearance, Damages (Thermal and Mechanical), Seam Performance, Seam Degradation, Seam Failure and Seam Testing. Sewing thread and selection of sewing thread for different fabrics.

Unit:3	Finishing and Packing	12 hours

Apparel Finishing: Importance of Garment pressing and finishing, Types of Garments, pressing of Garments and Specialty Garment Finishes.

Quality Checking: Inspection, Interactive bar coding, needle detection.

Packaging and ware housing: Types of packing and packing materials, quality specification, merchandise packing and shipping packing. Intra transport, ware housing, computerized storage

systems. Automation in material handling.		
Unit:4	**Production Planning and Control**	**12 hours**
Production Control: Definition, objectives of production control, co ordination of production control department with other departments in the manufacturing organizations. Pre production functions – product acceptance, steps from prototype to production model, order requirements. **Work study**: Definition, Purpose, Techniques of work study. Procedure of work study. Work study in textile and apparel industries. Time and motion study in apparel industry.		
Unit:5	**Plant Loading and Capacity Planning**	**10 hours**
Determination of machinery requirements for a new factory, calculation of labour requirements, application of line balancing techniques – Balance control. Advanced tools and equipment in industrial engineering.		
Unit:6	**Contemporary Issues**	**02 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**60 hours**

Text Books	
1	Apparel Manufacturing Technology, T.Karthick et al, CRC Press, 2016.
2	Garment Manufacturing Technology, Rajkishore Nayak & Rajiv Padhye, Elsevier, 2015.
Reference Books	
1	Industrial Engineering in Apparel Production, V.Ramesh Babu, Elsevier Science & Technology, 2017.
2	Automation in Garment Manufacturing, Ed. Rajkishore Nayak & Rajiv Padhye, Woodhead Publishing, 2017.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://ncert.nic.in/textbook/pdf/lehe203.pdf
2	https://www.youtube.com/watch?v=KV7BvBziXvs
3	http://texmin.nic.in/sites/default/files/Garment%20Study%20-%20Final%20Report%20-%2026.02.2018.pdf
Course Designed By: Dr.K.Amutha	

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	L	M	L	S	M	L	S	S	S
CO2	S	S	S	S	S	L	M	S	S	S
CO3	S	S	S	M	S	L	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	M	S	S	S

*S-Strong; M-Medium; L-Low

Course code	13P	INNOVATIVE CAD DESIGNING	L	T	P	C
Core - Practical			-	-	3	3
Pre-requisite		Basic knowledge about fashion designing using CAD	Syllabus Version		2020-2021	

Course Objectives:

The main objectives of this course are to:

1. Illustrate the various garment design for various seasons
2. Illustrate the various garment design for various occasions
3. Illustrate the various garment design using CAD
4. Preparing specification sheet using CAD
5. Work on individual projects as well as set practical and experimental exercise.

Expected Course Outcomes:

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

1	Apply garment designing by illustration manually	K3
2	Analyze the designing based on a theme	K4
3	Evaluate the designed garment by selected inspiration	K5
4	Create the illustration using CAD software	K6
5	Create specification sheet for the designed garments	K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

1. Fashion illustrations by hand for various seasons and occasions (men and women)
2. Fashion illustrations by hand for various seasons for children
3. Fashion illustrations by hand for various occasions (men, women and children)
4. Fashion illustrations using CAD for various seasons(men, women and children)
5. Preparing the specification sheet using CAD for industrial production

Total hours	**75 hours**

Text Books

1	Basics Textile Design 01: Sourcing Ideas: Researching Colour, Surface, Structure, Texture and Pattern Paperback , Josephine Steed , Frances Stevenson, 2012
2	Print, Make, Wear: Creative Projects for Digital Textile Design Paperback, The People's Print, by Melanie Bowles**,** 2015.
3	CAD in Clothing and Textiles Paperback – Import, Winifred Aldrich, 1994

Reference Books

1	Digital Textile Design, Second edition Paperback ,Melanie Bowles, Ceri Isaac Illustrated, 2012
2	Digital Textile Design: Portfolio Skills (Portfolio Skills: Fashion & Textiles)**,** Melanie

	Bowles, Ceri Isaac, 2009
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://www.coursera.org/courses?query=cad
2	https://onlinecourses.swayam2.ac.in/nou20_cs15/preview
3	https://learning.naukri.com/textile-design-courses-certification-training-by-coursera-st369-tg361-5
4	https://www.compufield.com/high_res_textile_designing_sample9.html
5	https://www.slideshare.net/BusinessVibes_Network/textile-webinar
6	https://www.cita.org.hk/en/event/free-webinar-on-how-to-present-the-3d-garment/
Course Designed By: Dr.M.Jayakumari	

Mapping with Programme Outcomes										
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	M	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	M	M	M	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

*S-Strong; M-Medium; L-Low

Course code	13Q	ADVANCED DRAPING	L	T	P	C
Core - Practical			-	-	4	4
Pre-requisite		Basic knowledge and skill in draping, pattern drafting and sewing.	Syllabus Version		2020-2021	

Course Objectives:

The main objectives of this course are to:

1. Drape creative designs on the dress form.
2. Convert the draped design into garment.
3. Construct the garment and check it's fit.

Expected Course Outcomes:

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

1	Apply draping skills for design development.	K3
2	Creation of draped design by trueing.	K6
3	Create pattern for the draped designs.	K6
4	Apply draped pattern for garment construction.	K3
5	Evaluate the garment for fit.	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Draping and construction of garment for men / women / children's with design variations such as Kimono, Raglan Sleeve Designs, Princess Shapers, Collars, Cowls, Pleats, Flounces, and Ruffles.

1. Preparation of fabric for Draping
2. Draping
3. Converting or Truing the Pattern
4. Pattern Development
5. Construction of Garment
6. Fitting of final garment on dress form

Total hours **75 hours**

Text Book

1	The Art of Fashion Draping, Connie Amaden-Crawford, Bloomsbury Publishing, 2018.

Reference Book

1	Draping: The Complete Course, Karolyn Kiisel, Laurence King Publishing, 2013.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	http://www.universityoffashion.com https://www.youtube.com/channel/UC4E_BMa2yxhsZlGVUFlpf0w
2	https://www.youtube.com/playlist?list=PLn7sj3_E1Tjpjgb188eC2HLYlTq_tvfpu
3	https://www.youtube.com/c/FiFiStyle/featured
4	https://www.youtube.com/playlist?list=PLct6hts5CLMK6tWm1hALcNPmG0YXzv7u8

Course Designed By: Dr. K. Amutha

Mapping with Programme Outcomes										
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	S	L	M	M	L	M	S	S
CO2	S	S	S	L	M	M	L	M	S	S
CO3	S	S	S	M	L	M	M	M	S	S
CO4	S	S	S	L	L	M	L	M	S	S
CO5	S	S	M	L	L	M	L	M	S	S

*S-Strong; M-Medium; L-Low

Course code	1EA	FASHION CONCEPTS AND DESIGNING	L	T	P	C
Elective			4	-	-	4
Pre-requisite		Basic knowledge about Designing Costumes	Syllabus Version		2020-2021	

Course Objectives:

The main objectives of this course are to:

1. Apply knowledge of designs effectively
2. Implement the learned concepts as a designer.
3. Study about the colouring & texture for fashionable design.
4. Develop wardrobe collection for different seasons.
5. Design costumes for different themes.

Expected Course Outcomes:

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

1	Apply designs concepts and techniques effectively	K3
2	Create and Implement the design concepts in dress designing	K6
3	Create and Explore the colouring & texture for designing	K6
4	Create garment designing based on the principles of designs.	K6
5	Apply the illustrated designs on different types of clothing.	K3

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	Basic Elements of Designing	11 hours

Elements Of Design: - Basic Elements - Designing of costumes using elements of design - line, dot, curves, texture, shine, rough, silhouettes, color - Define Application of Principles: Balance, rhythm, harmony, repetition, grading, unity, symmetry.

Unit:2	Color Theory	12 hours

Colour Theory:- Color Theory: Color wheel - primary, secondary, transparency - Techniques of color mixing - Color Contrast and Attributes: interaction, harmony, psychology, mood, culture and expression - Composition: Color, space, movement, balance, asymmetry, rhythm, shapes, proportion - Aspects / temperature of color-warm cool, hot, cold, dark, pale and bright - Application of Principles in garment Designing for latest trends - Dimensions of color- hue, Intensity, value, chroma - Basic color schemes- achromatic, analogues, monochromatic, complimentary, and neutral – Rendering techniques.

Unit:3	Textures and Design	11 hours

Textures and Design - Personal appearance and fit - Textures-types of textures - Textural effects, using textures in designs – Color and texture of the fabric. Design feature, Personal appearance and fit for different figure types

Unit:4	Indian and Global Fashion Designers	12 hours

An overview on Indian and global Fashion designers, Understanding Fashion designer – types – classicist, idealist, influenced, realist and thinking poet. Indian Fashion designers– Haute couture – Manish Malhotra, Wendell Rodricks, Abu Jani and Sandeep Khosla, Tarun Tahiliani, JJ Valaya, Rina Dhaka, Manish Arora , Rohit Bal, Ritu Beri, Ritu Kumar , Omi Gurung, Shilpa Reddy, Vikram Phadnis, Neeta Lulla, Erum Ali, Payal Jain.

Global Fashion designers - France, Italy, America, Britain, Fareast- Contributions of well known designers from France-Agnes, Sophie Albou Italy- Pierre Cardin, Roberto Cavalli America - Adams Adrian, Joseph Abboud. Britain -Basso & Brooke and Fareast Countries - Sandy Powell, Valentino Garavani.

Unit:5	**Designing Costumes for Different Themes**	**12 hours**

To develop wardrobe collection for different seasons and design costumes for different themes.

Unit:6	**Contemporary Issues**	**02 hours**

Expert lectures, online seminars - webinars

	Total Lecture hours	**60 hours**

Text Books

1	Fashion Design, Janice G.Ellinwood, Fairchild Books, colour illustrations, 2011.
2	Fashion Color Harmony, Hibeaki, Publisher Rockford, 2016.
3	The Art of Costume and Personal Appearance‖ By Grace Margaret Morton, 1964.

Reference Books

1	Fashion Rendering with Color, Bina Abling, 2000.
2	Individuality in Clothing Selection and Personal Appearance Hardcover – Import,Suzanne Marshall , Hazel Jackson, M. Sue Stanley Ph.D. , Mary Kefgen , Phyllis Touchie-Specht Fashion –From concept to consumer – Gini Stephens Frings , 6th edition, prentice Hall ,1999.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	https://onlinecourses.nptel.ac.in/noc20_de01/preview
2	https://onlinecourses.swayam2.ac.in/cec19_te01/preview
3	https://www.amazon.in/Swayam-Curtain-Concept-Printed-Curtains/dp/B00MYU5YN2
4	https://slideplayer.com/slide/1521339/
5	https://slideplayer.com/slide/1521428/
6	https://www.eventbrite.com/d/online/fashion--seminars/

Course Designed By: Dr.M.Jayakumari

Mapping with Programme Outcomes										
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S

CO5	S	S	S	S	S	S	S	S	S	S

*S-Strong; M-Medium; L-Low

Course code	**1EB**	**TEXTILE APPAREL MARKETING AND MERCHANDISING**	**L**	**T**	**P**	**C**
Elective			4	-	-	4
Pre-requisite		**Basic knowledge about marketing and merchandising**	**Syllabus Version**		2020-2021	

Course Objectives:

The main objectives of this course are to:

1. Learn about marketing concepts
2. Understand the marketing strategy.
3. Know about the Role of Merchandiser
4. Recognize the need and the ability to understand Display Settings
5. Understand the Process of Entrepreneurship development

Expected Course Outcomes:

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

1	Understand the Perceptions marketing environment	K2
2	Apply the concepts of Apparel and Fashion Merchandising	K3
3	Evaluate the principles of visual merchandising	K5
4	Analyse the Fashion and the communication process	K3
5	Create the Impact of Retail Merchandising & Functions of entrepreneurship	K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**Marketing**	**10 hours**

Marketing Concepts, Marketing Management, Marketing System, Marketing environment, Marketing Organization, Strategic Marketing Process and Augmented reality marketing, Factors influencing buying behavior - Buying process segmentation: Market segmentation - Market Potential - Estimation - Demand Forecasting .Marketing Research: Purpose, Procedure and Applications - Case Study. Marketing of Apparel and Fashion Products. Role of Merchandiser – Types of Merchandises - Export House, Manufacturer, Buying House, Merchandising Correspondence - Orders, handling of orders and dealing with manufacturers - Advertising - Trade fair participation and other methods of sales promotion in merchandising.

Unit:2	**Merchandising**	**12 hours**

Merchandising - Merchandise – definition - Apparel and Fashion Merchandising - Role of Merchandiser – Types of Merchandises. Visual merchandising – Color and Texture, Line and Composition light and Lighting,. Role of lighting in visual merchandising, Colours and types of lightings. Display and Display Settings - Types of display, Types of mannequins. Technology trends in Visual Merchandising-Interactive videos, Mobile Integration, Endless Aisles, and QR Codes, Virtual reality .Application of artificial Intelligence in Visual merchandising

Unit:3	**Fashion Communication**	**12 hours**

Fashion and the communication process: The Theories of fashion adoption need for promotion of

fashion. Fashion writing, editing, advertising, public relations, press laws and media ethics. Visual communication-Fashion photography, window display and multimedia – audio, still images, animation, video footage and interactivity. Communication in practice, Scripting shows, conducting interviews, reporting events, fashion critics, planning PR campaigns, formulating case studies, designing cataloves and brochures. Visualization of décor and ambience, preparing short films/audiovisuals, choreography of fashion event.

Unit:4	Fashion Retailing	12 hours

Retail Merchandising - The Marketing Channel, Retail organization structures, retail merchandising , Retailing Formats - Department stores specialty stores , Retail Locations, Brands and Private Labels, Financial Aspects of Merchandising, Store Layout and Merchandise Presentation, Contemporary Issues

Unit:5	Entrepreneurship Development	12 hours

Entrepreneur – Definition and Functions of entrepreneurship - Types and problems, Characteristics of an entrepreneur, Entrepreneurship development, Process of Entrepreneurship development, Project identification - Project formulation - Feasibility analysis and report. Selection. Project appraisal – Concepts and Methods - Cash flows, Payback period, ROI Methods of minimizing risk. Steps for starting a small scale enterprise. Institutional finance to entrepreneurs - Commercial Banks. Other financial Institutions - IDBI, IFCI, ICICI, IRBI, LIC, UTI, SIDC, SIDBI, EXIM Bank, Role of Government in entrepreneurship development. Entrepreneurship in Textile Industry, Textile and MSM -MSE-Cluster Development Programme (MSE-CDP)

Unit:6	Contemporary Issues	2 hours

Expert lectures, online seminars - webinars

	Total Lecture hours	60 hours

Text Books

1	Visual Merchandising, Tony Morgan, Laurence King, 2011.
2	Marketing Management, Philip Kotler, Printice Halllnc, 1996.
3	How To *Produce Successful Advertising* 3 E, *A. D. Farbey*, 2002
4	Merchandise Buying and Management, John Donnellan, *4th edition,2013*
5	Entrepreneurship development, S. Khanka, S.Chand limited, 2006.

Reference Books

1	Introduction to Fashion Merchandising, Fashion Merchandising Introduction Evelyn Grace, Prentice-Hall, 1978.
2	*Textiles, Sara J. kadolph*, Pearson, 2010
3	Fashion Retailing: A Multi-Channel Approach Paperback , Jay Diamond , Ellen Diamond, Sheri Litt ,March 2015
4	Fashion Communication, Dr.M.Jayakumari, Laser park publications, 2017
5	Entrepreneurship development, C.B. Gupta, N.P. Srinivasan, Sultan Chand &Sons, 1992.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	https://onlinecourses.swayam2.ac.in/cec20_mg06/preview
2	https://onlinecourses.swayam2.ac.in/cec20_ge03/preview
3	https://www.classcentral.com/course/iversity-store-design-visual-merchandising-and-shopper-marketing-3366 ttps://onlinecourses.swayam2.ac.in/cec20_mg01/preview
4	https://www.coursera.org/courses?query=fashion%20design
5	https://onlinecourses.swayam2.ac.in/cec20_mg19/preview
Course Designed By: Dr.M.Jayakumari	

Mapping with Programme Outcomes										
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

*S-Strong; M-Medium; L-Low

Course code	1EC	APPLIED PHYSICS AND CHEMISTRY	L	T	P	C
Elective			4	-	-	4
Pre-requisite		Any science degree	Syllabus Version	2020-2021		

Course Objectives:

The main objectives of this course are to:

1. Learn the chemistry of textile fibres, dyes and detergents.
2. Learn the physical properties of textile polymers and fibres.

Expected Course Outcomes:

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

1	Understand the natural and synthetic polymers in textile fibres.	K2
2	Understand the various dyes used in the textile industry.	K2
3	Understand the detergents and soaps used in textile applications.	K2
4	Analyze the structural properties of textile fibres.	K4
5	Analyze the mechanical and thermal properties of textile fibres.	K4

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	Textile Fibres, Polymers and Natural polymers	12 hours

Textile Fibres: Classification – natural and manmade fibres, Chemical structure and Composition.

Polymers: Introduction – Classification – Types and mechanism of polymerization – Degree of Polymerization – Crystalline vs. amorphous regions. Synthesis and application of polymers: Polyethylene (LDPE & HDPE), Polyacrylonitrile, Polyesters (PET), Polyamides – Nylon 6 and Nylon 66. **Natural polymers:** Natural resins, Polysaccharides, Starch, Glycogen, Cellulose, Preparation and processing of cellulose.

Synthetic fibres: Important requirements of a fibre, Difference between natural and synthetic fibres, Properties of synthetic fibres, Preparation of synthetic fibres, Methods of spinning, application of synthetic fibres, Rayon or artificial silk, Nitrocellulose rayon or pyroxylin, Cuprammonium rayon, Viscose rayon, Properties of viscose rayon, Nylon-6 (Kapron), Various routes of nylon, Nylon -66, Properties of nylon intermediates.Nylon-6 or perlon L. Properties of nylon-66.

Unit:2	Dyes	12 hours

Dyes: Sensation of colour, Colour and constitution, Nomenclature.Dyeing, methods of dyeing, direct dyeing, vat dyeing, mordant dyeing, Substantive dyeing, disperse dyeing, formation of dye on the fibre, dyeing with reactive dyes, dyeing of wool with acid dyes, cross dyeing, basic operation of dyeing, dye intermediates.

Classification of dyes: Classification of dyes based on chemical constitution,nitroso dyes, nitro dyes, azo dyes, acid azo dyes, methyl orange, methyl red.**Classification of dyes based on their mode of application**, acid dyes, basic dyes, direct or substantive dyes, modern or adjective dyes, ingrain or developed dyes, Ice colours, Sulphur dyes, pigment dyes, Solvent or spirit soluble dyes.

Unit:3	Detergents and Soaps	10 hours

Detergents: Principal groups of synthetic detergents, Classification of surface active agents, Anionic detergents.

Soaps: General consideration in soap making, Manufacture of soaps, Metal soaps, Oil to be used soaps, Cleansing action of soaps. Alkyl sulphonates, alkyl aryl sulphonates, Alkyl sulphates, Amide sulphonates, Miscellaneous compounds. Cationic, Non-ionic and Amphoteric detergents. **Surfactants:** Classification and applications of surfactants, Biodegradability of surfactants, Ecofriendly detergent containing enzymes, Ecofriendly detergents-zeolites, Detrimental effects of detergents.

Green chemistry approaches in textile industry.

Unit:4	Structural Properties	12 hours

Crystallinity- % of Crystallinity & orientation of polymer; measurement of crystallinity & orientation – powder XRD analysis. Single fibre structure – Single crystal XRD analysis.
Surface analysis – Optical microscopy, FE-SEM, Energy Dispersive Spectroscopy (EDAX).
Optical properties – Optical absorption or transmittance – UV-Vis-near IR Spectroscopic methods – lower & upper cut-off wavelength, % of transmittance.

Unit:5	Mechanical &Thermal properties	12 hours

Mechanical properties – Tensile strength & Young's modulus, density measurement methods.
Thermal analysis – TG & DTA, DSC, NMR.
Swelling phenomenon of textile fibres – types of swelling – factors influencing swelling – effects of swelling.

Unit:6	Contemporary Issues	02 hours

Expert lectures, online seminars – webinars

	Total Lecture hours	60 hours

Text Books

1	Industrial Chemistry, B.K.Sharma, Krishna Prakashan Media (P) Ltd, Goel Publishing house, 19th edition 2016.
2	Handbook of Tensile Properties of Textile and Technical Fibres, A. R. Bunsell, Elsevier Science, 2009.
3	Crystals and Crystallinity in Polymers: Diffraction Analysis of Ordered and Disordered Crystals, Claudio De Rosa, Finizia Auriemma, Wiley, 2013.

Reference Books	
1	Text book of Organic Chemistry, Soni P L &Chawla H M, S Chand & Co., 2010.
2	Textile Chemistry, Thomas Bechtold& Tung Pham, De Gryuyter, 2019.
3	Chapter 3 Green Chemistry in Textiles, *Sustainable Innovations in Textile Chemistry and Dyes*, S.S. Muthu (ed.), Springer Nature Singapore, 2018.
4	Physical Properties of Textile Fibres, J. W. S. Hearle, W E Morton, Elsevier Science, 2008.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://www.researchgate.net/publication/303389573_Green_chemistry_in_Textile_Industry
2	https://www.researchgate.net/publication/263561504_Green_chemistry_and_the_textile_industry
3	https://pubs.acs.org/doi/pdf/10.1021/ie303627x
4	https://levistrauss.com/wp-content/uploads/2016/11/UC-Berkeley_Haas-Case-Study_Driving-Adoption-of-Green-Chemistry.pdf
Course Designed By: Dr.K.Amutha	

Mapping with Programme Outcomes										
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	M	L	L	M	M	M	M	M	S
CO2	S	M	L	L	M	M	M	M	M	S
CO3	S	M	L	L	M	M	M	M	M	S
CO4	S	S	M	L	S	M	M	M	M	L
CO5	S	S	M	L	S	M	S	M	M	L

*S-Strong; M-Medium; L-Low

Second Semester

Course code	23A	ADVANCED WET PROCESSING	L	T	P	C
Core			4	-	-	4
Pre-requisite		Basic knowledge about Textile Processing	Syllabus Version	2020-2021		

Course Objectives:

The main objectives of this course are to:

1. Learn about the pre and post dyeing wet processing with recent developments.
2. Learn about Textiles dyes and chemicals.
3. Learn about Textile printing and its fixation
4. Learn about Textile finishing and its applications in Textile Industry.
5. Learn about the Bio technology and Effluent Treatment plants

Expected Course Outcomes:

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

1	Apply the pre and post dyeing wet processing in industry	K3
2	Apply the types of Textile dyes and its Classification and chemicals.	K3
3	Create and analyze the Textile printing and its methods and classifications.	K3 & K6
4	Evaluate the process of Textile finishing, classification and its applications using enzymes	K4 & K5
5	Evaluate and explore the techniques of Bio technology and Effluent Treatment plants	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	Preparatory Process	11 hours

Introduction, Fiber – Composition - Typical Sequence of Processes - General Wet Processing Sequence for Cotton, Silk, Wool - Pre-Dyeing preparatory Processing - Desizing Starch - Scouring – Bleaching – Mercerising, Washing, Drying.

Unit:2	Dyeing	12 hours

Classification of Dyes - Dyeing Machines, Influence of Physical and Chemical Structure of Fibers on Dyeability - Types of Dyeing Machine, Jet, HT, Beam Dyeing Machine, Padding Mangle, and Jigger - Recent developments in dyeing, Enzymes used for dyeing.

Unit:3	Printing	12 hours

Styles of Printing - Methods of Printing, Block, Flat, Rotary Screen, engraved Roller, Transfer, Duplex printing, Pigment Printing, Batik, Khadi - Fixation and After Treatment - Print Paste Formulation.

Unit:4	Finishing	12 hours
Necessity for Finishing – Commercial importance of finishing - Mechanical finishes, heat setting, anti shrink, calendaring - Finishing chemicals – Resin finishing, Flame proof & flame retardancy, Soil Release Finish, Foam Finish, Water proof & Repellent - Micro encapsulation techniques in finishing process. **Enzymes & Proteins** – Sources and Applications - Application of enzymes in Textile Chemical Processing - Mechanism of enzyme reactions – Bioscouring - Bio- bleaching, Combined bio - processing, bio washing, bio polishing, Denim fading, anti odour and anti microbial finishes, bio finishing and other applications - Evaluation of enzyme treated fabrics		
Unit:5	**Effluent Treatment Plants**	**11 hours**
Characteristic of textile effluent, Developments in membrane techniques in the effluent treatment - Energy conservation steps in chemical processing - Low wet pick-up techniques - Causes and remedies for water and air pollution – Bio-Technology in textile effluent treatment plants		
Unit:6	**Contemporary Issues**	**02 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**60 hours**

Text Books	
1	Dyeing and Chemical Technology of Textile Fibers, Trotman, E.R., Charles Griffin & Co. Ltd., U. K., 1984.
2	Wet Processing Machineries, R.S.Bhagwat, Mahajan Publications, 2000.
3	Technology of Dyeing, Shenai.V.A, Sevak publications, Mumbai, 1995
4	Textile Printing, Miles. L.W.C, SDC, England, ISBN: 0901956570,1994,
Reference Books	
1	Treatment of Textile Processing Effluents, Manivasakam,N, Sakthi Publication, Coimbatore,1995
2	Chemical Processing of Synthetic Fibers and Blends, Datye K.Vand Vaidya.A.A, John Wiley and Sons, NewYork,1984
3	Finishing of Garments and Knits, NCUTE – Programme series held at Ichalkaranchi, IIT, Delhi,2003.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://swayam.gov.in/nd1_noc20_te09/preview
2	https://swayam.gov.in/nd1_noc20_te02/preview
3	https://www.classcentral.com/course/swayam-textile-finishing-14326
4	https://swayam.gov.in/nd1_noc19_ce32/preview
5	https://www.cottonworks.com/upcoming-webinar-advances-in-sustainable-dyeing/
6	https://www.pall.co.in/en/microelectronics/webinars/wpci2017.html
7	https://www.aatcc.org/events/online/webinars/page/2/
8	https://www.slideshare.net/MushfiqueSakif/difference-between-garments-dyeing-fabric-dyeing
9	https://www.slideshare.net/nishohel/wet-processing-23961418
10	https://www.slideshare.net/sheshir/new-microsoft-office-power-point-presentation-copy-2-

	32667173
11	https://knittingviewsbd.com/everlight-seminar-offers-sustainable-solution-for-textile-wet-processing-industry/
Course Designed By: Dr.M.Jayakumari	

Mapping with Programme Outcomes										
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	M	S	S	M	S	M	S	M	S
CO3	S	M	S	L	M	S	M	S	M	S
CO3	S	M	S	S	M	S	M	S	M	S
CO4	S	M	L	S	M	S	M	S	M	S
CO5	S	M	S	S	M	S	M	S	M	S

*S-Strong; M-Medium; L-Low

Course code	23B	RESEARCH METHODOLOGY AND STATISTICS	L	T	P	C
Core			4	-	-	4
Pre-requisite		Any UG Degree	Syllabus Version		2020-2021	

Course Objectives

The main objectives of this course are to:

1. Give an overview of the research methodology and explain the technique of defining a research problem
2. Organize scientific investigation to solve problem, test hypotheses, develop or invent new products.
3. Explain the art of interpretation and the art of writing research reports.

Expected Course Outcomes

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

1	Know about Research, types and concepts and developing a Research Plan related to Textile Industry.	K1
2	Understand range of quantitative and / or qualitative research techniques to textile related business management and environmental problems.	K2
3	Apply and analyze sampling designs, measurement and scaling techniques and also about different methods of data collections.	K3
4	Develop necessary critical thinking skills in order to evaluate different research approaches utilized in the textile and its related industries.	K4
5	Understand the Role of research Software's in Research evaluation	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	Introduction to Research	08 hours

Meaning Of Research, Types of Research - Significance of Research - Research Process. Defining the Research Problem - Sources, Identification, Selection and Statement, Review of related literature

Unit:2	Research Design	10 hours

Research Design - Meaning, Types of research designs, Basic Principles of experimental designs. Developing a Research Plan related to Textile Industry.
Sampling and its Techniques, Steps in sampling design, criteria for selecting a sampling procedure, Characteristics of a good sample design.

Unit:3	Methods of Data Collection	10 hours

Methods Of Data Collection - Observation, Questionnaire, Interview. Data Processing- Collection, Classification, Tabulation, Graphical Representation and Data Analysis.

Unit:4	Research Report	15 hours

Research Report - Format of research report, Main body of the report, References and appendices, Style of writing, Typing the Report, Pagination, Tables and Figures, Evaluating the report. Plagiarism check.		
Unit:5	**Meaning and Scope Of Statistics**	**15 hours**
Meaning and scope of statistics, Role of Statistics in research Software's and its applications, common software's used for statistical analysis. Measures of central tendency and dispersion. Correlation- Co-efficient of Correlation and its Interpretation, Rank Correlation, Regression equation, Application of Chi-Square test, ANOVA test. (only theory, No problems for exam)		
Unit:6	**Contemporary Issues**	**02 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**60 hours**

Text Books	
1	Research Methodology: Methods and Techniques, C.R. Kothari, Gaurav Garg, New Age International, 4th Edition, 2018
2	An Introduction to Statistical Methods, S P Gupta, Vikas Publishing House, New Delhi, 2009
3.	Research in Education, Best J N, Prentice Hall, Delhi, 1979
Reference Books	
1	Statistical method- An introductory text, J. Medho, New age International publishers, New Delhi, 2005
2	Introduction to Research in Education, Donald Ary, Lucy Cheser Jacobs , Wordsworth Pub Co, 8th edition, 2009
3	Handbook of Research Methodology A Compendium for Scholars & Researchers, Dr. Shanti Bhushan Mishra Dr. Shashi Alok, Educreation Publishing, 2011
4	Research Methodology: A Step by Step Guide for Beginners, Ranjit Kumar, SAGE Publications, 2014
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1.	UGC MOOCs http://ugcmoocs.inflibnet.ac.in/ugcmoocs/view_module_pg.php/838
2	Research Methodology, By Prof. G.S.Bajpa, https://www.classcentral.com/course/swayam-research-methodology-17760
3	Introduction to Research , By Prof. Prathap Haridoss | IIT Madras https://swayam.gov.in/nd1_noc19_ge21/preview
4.	https://www.classcentral.com/course/swayam-introduction-to-research-5221
Course Designed By: Dr.S.Grace Annapoorani	

Mapping with Programme Outcomes										
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	S	S	S	S	S	M	M	S
CO2	M	S	S	S	S	S	S	M	M	M

CO3	S	S	S	S	S	S	S	M	M	M
CO4	M	S	S	M	M	S	S	S	S	M
CO5	M	L	L	S	S	M	L	L	L	S

*S-Strong; M-Medium; L-Low

Course code	**23C**	**TEXTILE TESTING**	**L**	**T**	**P**	**C**
Core			4	-	-	4
Pre-requisite		**Basic knowledge about textile materials and test parameters.**	**Syllabus Version**		**2020-2021**	

Course Objectives:

The main objectives of this course are to:

1. Learn about the importance of textile testing and its role in quality control.
2. Demonstrate the testing methods and instruments for testing of textiles.
3. Learn about the national and international standards for textile testing.

Expected Course Outcomes:

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

1	Understand the importance of textile testing and its role in quality control.	K2
2	Apply various testing methods and instruments for testing of textiles.	K3
3	Understand the national and international standards for textile testing.	K2
4	Evaluate the properties of textile materials by testing.	K5
5	Evaluate the quality of textile materials based on test results.	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**Introduction to Textile Testing**	**12 hours**

Textile testing – definition – objectives; Types – destructive and non-destructive. Selection of samples for testing: fiber - zoning, core sampling, random draw and cut square methods, yarn – random sampling and fabric sampling. Standard atmosphere for testing - Measurement of Moisture regain - Conditioning oven & Shirley Moisture meter. Preparation of samples for testing: conditioning and pre-conditioning.
Sources of textile testing standards: ISO, BIS, BSI, AATCC, ASTM, ANSI.

Unit:2	**Fiber Testing**	**12 hours**

Conventional Testing methods: Cotton fiber length - Baer Sorter, Fineness - Sheffield micronaire, Maturity - Caustic soda swelling, Strength - Pressley bundle strength tester and Stelometer. Determination of trash and lint in cotton - Shirley trash analyser.
Computerized testing methods: HVI, AFIS, Cottonscope, MDTA4

Unit:3	**Yarn Testing**	**12 hours**

Yarn numbering systems: direct and indirect; Conversion of count from one system to another;

Instruments for count determination – wrap reel and balance, quadrant balance, Beesley balance. **Yarn strength testing**: Principles of CRT, CRL, CRE – Single yarn strength tester – UT J, UT R, Lea strength tester.
Yarn twist: definition, direction of twist, twist multiplier, measurement of yarn twist.
Yarn Evenness: classification of variation, methods of measuring evenness, Uster evenness tester-UT 6. **Yarn faults**: classification- Uster Classimat 3 & 5.
Yarn hairiness: S3 value, UHL400.

Unit:4	**Fabric Testing-1**	**12 hours**

Physical Parameters: Length, width, count (EPIxPPI), crimp, weight (GSM), cover factor, thickness, air and water permeability, Fabric dimensional stability to domestic washing and drying.
Mechanical Parameters: Tensile strength, tearing strength, bursting strength, peel bond strength.
Handle and comfort parameters: Fabric abrasion, pilling, drape, stiffness, crease resistance / crease recovery, sensory testing, thermo-physiological testing, thermal comfort, FTT - Fabric Touch Tester.

Unit:5	**Fabric Testing-2**	**10 hours**

Fabric flammability testing: vertical and inclined plane.
Colour fastness: laundering**,** dry cleaning, crocking, perspiration, sunlight and hot pressing.
Seam testing: seam strength, seam slippage.
Accessories Testing: Zipper, Buttons, Sewing thread.

Unit:6	**Contemporary Issues**	**02 hours**

Expert lectures, online seminars - webinars

	Total Lecture hours	**60 hours**

Text Books

1	A Practical Guide to Textile Testing, Amutha.K, CRC Press, 2016
2	Textile Testing, Raul Jewel, APH Publishing Corporation, 2005
3	Advanced Textile Testing Techniques, Sheraz Ahmad et al., CRC Press, 2017.

Reference Books

1	Fabric Testing, Ed. Jinlian Hu, Woodhead Publishing Ltd., 2008.
2	Principles of Textile Testing: An Introduction to Physical Methods of Testing Textile Fibers, Yarns and Fabrics, J.E.Books, Butter worths, 1986

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	https://nptel.ac.in/courses/116/102/116102029/#
2	https://nptel.ac.in/courses/116/102/116102049/
3	https://www.services.bis.gov.in:8071/php/BIS_2.0/dgdashboard/published/subcommtt?depid=NzE%3D
4	https://www.iso.org/committee/48148.html

Course Designed By: Dr.K.Amutha

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	L	M	L	S	M	L	S	S	S
CO2	S	S	S	S	S	L	M	S	S	S
CO3	S	S	S	M	S	L	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	M	S	S	S

*S-Strong; M-Medium; L-Low

Course code	**23P**	**TEXTILE TESTING**	**L**	**T**	**P**	**C**
Core - Practical			-	-	4	4
Pre-requisite		**Basic knowledge about textile materials and test parameters, sampling and test specimen preparation.**	Syllabus Version		2020-2021	

Course Objectives:

The main objectives of this course are to:

1. Test the quality parameters of the textiles using suitable instruments.
2. Evaluate the quality based on the test results.
3. Gain practical experience on the quality of textiles.

Expected Course Outcomes:

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

1	Understand textile testing.	K2
2	Apply knowledge and skill of textile testing.	K3
3	Analyze various quality parameters of textile materials.	K4
4	Evaluate the quality of materials based on the results.	K5
5	Analyze the suitability of materials for specific end use.	K4

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Testing and Evaluation of:
1.Yarn Count, lea strength hand CSP
2. Single Yarn Strength
3.Twist of yarn
4.Fabric parameters- EPI, PPI, Thickness, GSM
5.Stiffness of fabric
6.Abrasion Resistance of fabric
7.Crease Recovery of fabric
8.Drape of fabric
9.Pilling of fabric
10.Tensile Strength of fabric
11.Tear Strength of fabric
12.Bursting Strength of fabric

13.Colour Fastness to Washing and Crocking of fabric 14.Colour Fastness to Perspiration of fabric 15.Dimensional Stability of fabric to washing and drying	
Total hours	**75 hours**

Text Books	
1	A Practical Guide to Textile Testing, Amutha.K, CRC Press, 2016
2	Textile Testing, Raul Jewel, APH Publishing Corporation, 2005
3	Advanced Textile Testing Techniques, Sheraz Ahmad et al., CRC Press, 2017.
Reference Books	
1	Fabric Testing, Ed. Jinlian Hu, Woodhead Publishing Ltd., 2008.
2	Principles of Textile Testing: An Introduction to Physical Methods of Testing Textile Fibers, Yarns and Fabrics, J.E.Books, Butterworths, 1986
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://www.youtube.com/playlist?list=PLCC58838EBECB7149
2	https://www.youtube.com/channel/UCXw7428MTvquxKUZEOr4EAA/videos?view=0&sort=dd&flow=grid
3	https://www.youtube.com/channel/UCGqWXJgzpXyyu283QbdYiFQ/videos
Course Designed By: Dr.K.Amutha	

Mapping with Programme Outcomes										
Cos	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	L	M	L	S	M	L	S	S	S
CO2	S	S	S	S	S	L	M	S	S	S
CO3	S	S	S	M	S	L	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	M	S	L	S	S	S	S

*S-Strong; M-Medium; L-Low

Course code	23Q	ADVANCED GARMENT CONSTRUCTION	L	T	P	C
Core - Practical			-	-	4	4
Pre-requisite		Basic knowledge in garment construction	Syllabus Version		2020-2021	

Course Objectives:

The main objectives of this course are to:

1. Study about Machine adjustments in stitches
2. Learn about specialized work wear
3. Learn about industry method of inner wear
4. Develop need based garment
5. Develop garment accessory making

Expected Course Outcomes:

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

1	Understand Machine adjustments for stitches	K2
2	Create specialized work wear	K6
3	Apply industry method of inner wear garments	K3
4	Examine need based garment	K4
5	Evaluate garment accessory making	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

1. **Machine Adjustments**: Single Needle Lock Stitch Machine (SNLS) – Select fabrics of different construction and modify the stitches per inch and study the effects.
2. Design and construct **Uniform Clothing** for people like Policemen / Army / Navy / Doctors /Industry Workers
3. Design and construct **Innerwear** for men / women /children
4. Design and construct **Garment for Special people** / Bed ridden patients
5. Design and Construct **Accessories**: Gloves / Cap / Socks / Veils / Belt / Bow / Tie / Bags

Total hours	**75 hours**

Text Books	
1	Zarapkar System of cutting, Zarapkar Tailoring College, Navneet, 2010.
2	Reader's Digest Complete Guide to Sewing, Reader's Digest Association, 1982.
3	Basic Fashion Design-Ireland, Patrick john, London, B.T. Batsford, 1972.
4	Lifestyle Fashion styles, Samuel, K, Orbis Book Publishing Corporation Ltd. 1986.
5	Inside Fashion design, 2nd Edition Sharon Lee Tate, Mona Shafer Edwards, Harper and row, 1984.
6	Garment construction, Anita Tyagi, Sonali, 2012.
7	Garment technology, Aftab Ahmed Khan, Random, 2013.
8	Metric pattern cutting for mens wear, Winifred Aldrich, 5 th edition, wiley India Pvt.Ltd, Reprint 2015.
9	Couture sewing techniques, Anita Tyagi, Sonali,2014.
10	Garment manufacturing technology, Rajkishore nayak, Rajiv padhye, Woodhead, 2015.
Reference Books	
1	Pattern Magic, Tomoko Nakamichi, Laurence king, 2011.
2	Advanced Garment Construction Guide, Dr.M.Sumithra Woodhead publishing India in Textiles, 2020
3	Mertic pattern cutting for women's wear, Wiley, Winifred Aldrich,5th Edition, 2015.
4	Indian garment design course book, Mr. Ashish Kashyap, Ms. Rashmi Sharan and Ms. Rishika Jalali in coordination with Ms. Rupika Jain, Usha international limited, edition 2011
5	Design idea and accessories, Bhargav R, .first B.Jain, 2005.
6	Pattern Cutting, Melliar,B.T. Batsford, 1968.
7	Fabric Sewing Guide, Claire Shaeffers,K.P books, 2009.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=827
2	https://www.my-mooc.com/en/mooc/designing-and-creating-skirts/
3	https://www.classcentral.com/course/swayam-understanding-design-17831
4	https://www.edx.org/professional-certificate/hkpolyux-fashion-design-and-creation
Course Designed By: Dr.M.Sumithra	

Mapping with Programme Outcomes										
Cos	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	L	S	S	M	M	S	S	M	M	L
CO2	S	M	S	S	S	S	S	S	S	M
CO3	L	M	S	S	M	S	S	M	S	S
CO4	M	S	S	S	S	S	S	S	S	M
CO5	S	M	S	M	M	S	S	M	S	M

*S-Strong; M-Medium; L-Low

Course code	2EA	SOCIAL AND PSYCHOLOGICAL ASPECTS OF CLOTHING	L	T	P	C
Elective			4	-	-	4
Pre-requisite		Basic knowledge on Clothing & Apparels	Syllabus Version		2020-2021	

Course Objectives:

The main objectives of this course are to:

1. Learn about the origin of clothing.
2. Study the clothing comfort and factors.
3. Gain knowledge on garment fit and comfort.

Expected Course Outcomes:

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

1	Understand about the origin of clothing	K2
2	Understand the psychological aspects in clothing comfort	K2
3	Understand and analyze the thermal transmission characteristics of fabrics	K2
4	Design garments with clothing comfort for various purposes	K3
5	Design garments with suitable and appealing fit	K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	Origin of Clothing	12 hours

Theories of clothing – theory of modesty, immodesty, protections, adornment, combined need theory, other theories in fashion - Relation between clothing and other disciplines - (a) Physical Health - (b) Mental Health - Clothing and first impressions

Unit:2	Psychology and Comfort	10 hours

Psycho- Physiological Factors of Clothing Comfort - Psychophysics and clothing comfort - Wear trail techniques - Psychological aspects of aesthetic comfort.

Unit:3	Thermal Transmission	13 hours

Introduction - Thermo- regulations in human body - Thermal distress - Thermoregulation through clothing system - Thermal comfort of clothing - Transient heat flow and warm- cool touch of fabrics - Measurement of thermal transmission characteristics - Parameters for expressing thermal characteristics - Thermal transmission characteristics of fabrics

Unit:4	Relation Between Clothing and the Wearer	13 hours
Personality and self concept - Motivation in clothing choices - Individual values, interests and attitudes related to clothing - Behavior and clothing choices, practices and effect and clothing on the individual - Clothing and Society - Clothing and social behavior - Clothing influenced by religion and culture - Clothes and conformity - Clothes and occupation - Uniforms in schools and college - Clothes and colour and impact of colour.		
Unit:5	**Garment Fit and Comfort**	**10 hours**
Introduction - Body dimensions and pattern - Garment fit and comfort relationship – Factors related to garment fit - Measurement of garment fit		
Unit:6	**Contemporary Issues**	**02 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**60 hours**

Text Books	
1	The Psychology of Fashion (The Psychology of Everything) 1st Edition by Carolyn Mair, Taylor & Francis, 2018
2	Clothing appearance and fit science and technology, J.Fan, W.Yu and Hunter, 2004
3	Science in Clothing Comfort, by Apurba Das, R. Alagirusamy, Woodhead Publishing India, 2010
Reference Books	
1	Social Psychology of Dress Bundle Book + Studio Access Card, *Edition – 1st, Sharron J. Lennon, Kim K. P. Johnson, Nancy A. Rudd*, 2017
2	Fashion: The History Of Clothes Hardcover – Illustrated, Jacqueline Morley, 2015
3	Thermal Analysis of Textiles and Fibers, 1st Edition, Editors: Michael Jaffe Joseph D. Menczel , Woodhead Publishing , 2020
4	Clothing as Material Culture, Susanne Kuchler, Daniel Miller, 2005
5	The Social Psychology of Clothing: Symbolic Appearances in Context, Susan B. Kaiser, 1996
6	Improving Comfort In Clothing by Song G, Woodhead Publishing Ltd., January 2011
7	The Thermal Behaviour of Textiles, Vol. 8, No. 3, K. Slater, Textile Progress
8	Comfort Properties of Textiles, Textile Progress, Vol. 9, No. 4, 1977, K. Slater, 1976.
9	Quality control: Fabric comfort – V. K. Kothari
10	M. Yoneda and S. Kawabata, Analysis of Transient Heat Conduction and its Application-Part I, J. Text. Mach. Soc. of Japan, Vol. 29, No. 4, 1983,
11	Textiles for Cold Weather Apparel by J T Williams, Elsevier, 2009,
12	Protective Clothing: Managing Thermal Stress, Hardcover – Import, by F. Wang (Editor), Chuansi Gao (Editor), Woodhead Publishing Series in Textiles, 2014
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	Science of Clothing Comfort https://nptel.ac.in/courses/116102047/
2	P-07 - M-15-Garment Assembly and Fit https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=827
3	Clothing Comfort https://www.scribd.com/document/251745219/Clothing-Comfort
Course Designed By: Dr.K.Sangeetha	

Mapping with Programme Outcomes										
Cos	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	S	L	L	S	M	L	L	M
CO2	S	S	S	M	L	M	M	M	L	M
CO3	S	S	S	M	S	S	M	M	L	M
CO4	S	S	S	M	L	M	L	L	L	L
CO5	S	S	S	M	M	M	L	L	L	L

*S-Strong; M-Medium; L-Low

Course code	**2EB**	**TEXTILE INDUSTRY AND MANAGEMENT**	**L**	**T**	**P**	**C**
Elective			4	-	-	4
Pre-requisite		**Basic knowledge about textile industry in India**	**Syllabus Version**		**2020 - 2021**	

Course Objectives:

The main objectives of this course are to:

1. Study about origin, growth, development and economical status of textile industry.
2. Learn about Government plans for technological developments in fibre and spinning industry for improving the economy.
3. Technical developments in garment industry

Expected Course Outcomes:

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

1	Understand origin, growth and development of textile industry with economy.	K2
2	Analyze government plans for technological developments in fibre and spinning industry in Indian economy.	K4
3	To Analyze the necessity of Indian textile associations	K4
4	Analyze technical developments through government policies.	K4
5	Analyze sales order using tally	K4

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**Textile Industry**	**12 hours**

Origin, Growth and Development and economical status of Indian Textile Industry - Cotton, Wool, Silk – Rayon, nylon, polyester, acrylic, Man-Made Textiles, Readymade garments. Technological developments in Fiber, Yarn and Fabric Industry for improving the economy, Significance and uses.

Unit:2	**Textile Economics**	**12 hours**

Five year plans for the textile Industry - Recent plan and previous 5 Five year plans- Role of Textile Industry in Indian economy - Concept of GATT, MFA, WTO, AlC, Globalization & its impacts.

Unit:3	**Textile Associations & Organizations**	**12 hours**

Indian textile associations, SIMA, SITRA, SISPA, South Indian Spinners Association, Association of Man - Made Fibre Industry of India, Association of Synthetic Fibre Industry, Indian Spinners' Association, All India Texturisers' Association, National Textile Corporation Ltd, Confederation of Indian Textile Industry (CITI), The Cotton Corporation of India Ltd, The Clothing Manufacturers Association of India, Textile Machinery Manufacturers' Association (India), Indian Textile Accessories & Machinery Manufacturers' Association (ITAMMA), Federation of All India Textile Manufacturers Association (FAITMA), Federation of Indian Export Organization.

Unit:4	**Government Policies and Startups**	**12 hours**

Government policies for textile industries. Institutional support to entrepreneurs - Need for support - NSIC, NIESUBD,NEBD, PMEGP ,SIDO, SSIDC, SISI, SFC, DIC, TCO, TIIC, Kadhi and Village Industries Commission(KVIC), Industrial Estates. Five Government Schemes for Retail Businesses- Raw Material Assistance, Infrastructure Development Scheme, MUDRA Loans. Developing Training & Plug and Play Infrastructure - Start-up Warehouse ,Mobile Application Centre, United Nation Technology & Innovation Lab (UNTIL), . IoT Centre:, Entrepreneurs' Centre (Plug & Play Infrastructure).Incubation Centers-Common Working Space, Test and demonstration facilities, Mediation & Network, Training & Coaching, Business Support.

Unit:5	**Industry Management and Accounting**	**10 hours**

Inventory Management Techniques: Process and Tools-Sales Management-Aspects of Sales Management, Manage Sales with Tally.ERP 9, Sales order processing in Tally.ERP 9 – A efficient sales management tool-sales order, To enable sales order processing in Tally, Components of sales order report - Stock Group , Stock Item, Group Summary, All Orders.

Unit:6	**Contemporary Issues**	**02 hours**

Expert lectures, online seminars - webinars

	Total Lecture hours	**60 hours**

Text Books

1	An Introduction to Textile Economics, Benjamin Woolf Hirsh, Peter Ellis, Textile Trade Press, 1973.
2	Official guide to financial accounting using Tally ERP 9 with GST, Tally education pvt ltd, 2018.
3	Tally ACE, Tally education Pvt Ltd, 2019.

Reference Books

1	Textiles-Fiber to fabric, Bernard P Corbman, 6th edition, Mc Graw Hill Book Co, Singapore, 1983.
2	Tally GURU Vol.2, Tally education pvt ltd, 2019.
3	Startup India: Policies abound but limited impact on ground, Anu Thomas ,ET online, 2017

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	Indian Textile Journal- Business Press P. Ltd, Maker Tower B-18 floor, Cuff parade, Mumbai -400009

2	Textile Magazine, Magazine House, 710 Mount Road, Chennai
3	Textile trends, East land Publications Pvt Ltd, 44 Chittranjan Avenue, Calcutta-12.
4	Hosiery and Textile Journal-International Magazine Home-164 Modi Street, Fort, Mumbai
Course Designed By: Dr.M.Jayakumari	

Mapping with Programme Outcomes										
Cos	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	S	S	M	S	S	S	S	S
CO2	S	S	S	S	M	M	M	M	M	M
CO3	M	M	M	S	S	S	S	S	S	S
CO4	S	S	S	S	S	M	M	S	M	S
CO5	M	M	M	M	S	S	S	S	S	S

*S-Strong; M-Medium; L-Low

Course code	2EC	TEXTILE BIOTECHNOLOGY	L	T	P	C
Elective			4	-	-	4
Pre-requisite		Any science degree	Syllabus Version		2020-2021	

Course Objectives:

The main objectives of this course are to:

1. To know about the enzymes suitable for textile industry
2. To learn about the microbes in textile technology
3. To learn about the Bio-processing of Textiles
4. To learn about the manufacturing of Bio-functional Textiles
5. To know about the Biotechnology Application in Textile Industry

Expected Course Outcomes:

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

1	Understand the industrially important enzymes for processing the textiles	K2
2	Understand the role of microbes in textile	K2
3	Apply suitable enzymes in Textile processing	K3
4	Create Bio-functional Textiles	K6
5	Understand Biotechnology Application in Textile Industry	K2

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	Enzymes in Textiles	12 hours

Enzymes – General Terminology, Nomenclature and Classification; Enzymes in Textile industry – Amylases, Cellulases, Pectinases, Catalases, Proteases; Enzymes in treatment of textile dye effluent – Lignin peroxidases and Manganese peroxidases in degradation of azo dyes; Enzyme Engineering – Site-directed mutagenesis and Directed Evolution; Production of industrially important enzymes – Amylases, Cellulases, Lipases, Proteases: Subtilisin; Extraction of enzymes – soluble and membrane-bound. Purification of enzymes; Quantification of enzymes – colorimetric, spectrophotometric and spectrofluorometric assays; Biological assays.

Unit:2	Microbes in Textiles	12 hours
Microorganisms in textile industry –Bacteria (*Bacillus*), Yeast (*Saccharomyces*) and Fungi (*Aspergillus*); Methods of culturing microorganisms – Culture media types, Isolation of pure cultures.Nutritional types of microorganisms. Fermentation media – Formulation – Carbon, Nitrogen sources, Minerals, Growth factors, Antibiotics and Antifoams; Microbial growth–Batch, Continuous, Fed-batch cultures, Growth Curve, Measurement of microbial growth. Growth control–Physical Methods, Chemical agents; Downstream processing– Precipitation, Filtration, Centrifugation, Cell disruption, Chromatography – Adsorption, Ion-exchange, Gel permeation, Affinity, Reverse phase and HPLC.		
Unit:3	**Bio-processing of Textiles**	**12 hours**
Isolation of enzymes; Application of enzymes in Textile processing – Bio scouring, Bio desizing, Bio bleaching, Bio degumming, Bio stiffening, Denim fading; Special finishes: Nano particle preparation and micro encapsulation of bio/natural extractions for anti bacterial, anti fungal, fragrance finish.; Methods of Finishing: Dip and dry, pad dry cure, plasma treatment, ultrasonic atomizer.		
Unit:4	**Bio-functional Textiles**	**12 hours**
Introduction, types, manufacturing and applications of bio-functional textiles; Electrospun nanofibers as Bio-medical devices; Evaluation of bio-functional effects and safety, future trends.		
Unit:5	**Biotechnology Application in Textile Industry**	**10 hours**
Natural fibres: Transgenic cotton, wool, DNA profiling of animal hair fibres; Novel fibres: Protein polymers, spider silk, other new fibre sources: chitins and chitosan, bacterial cellulose, corn fibre, polyester fibres; Biofabrics: Dyes and intermediates from micro-organisms: Naphthoquinone dye, anthroquinones, indigo; Treatment of textile waste water: Bioremediation – Bacteria (*Bacillus*, *Staphylococcus*, *Pseudomonas* and other bacteria), Yeast (*Saccharomyces*, *Candida*), Fungi (*Aspergillus*, *Trichosporon*, *Galactomyces*) and Microalgae (*Chlorella*, *Spirogyra*) for decolouration, metal and toxin removal.		
Unit:6	**Contemporary Issues**	**02 hours**
Expert lectures, online seminars – webinars		
	Total Lecture hours	**60 hours**

Reference Books/Articles:

1	Advances in textile biotechnology Nierstrasz, V., & Cavaco-Paulo, A. (Eds.) Elsevier,2010.
2	Enzymes, Bio chemistry, Biotechnology Clinical Chemistry, Trever Palmer. Affliated East - West Press Ltd, New Delhi, 2004.
3	Principles of fermentation technology. Stanbury, P. F., Whitaker, A., & Hall, S. J. Third Edition. Elsevier, 2017.
4	Principles of fermentation technology, Stanbury, P. F., Whitaker, A., & Hall, S. J, Second Edition. Elsevier, 2003.
5	Lehninger principles of biochemistry , Nelson, D. L., Lehninger, A. L., & Cox, M. M. Macmillan, 2008 .
6	Biochemistry , U. Satyanarayana and U. Chakrapani, Arunabha Sen Books and Allied P Ltd, Kolkata, Third Edition, 2006.
7	Textile processing with enzymes, Cavaco-Paulo, A., & Gubitz, G. (Eds.), Elsevier. 2003.
8	Application of enzymes in the textile industry: a review, Mojsov, K., 2011.
9	Microbiology, Prescott, L. M., Harley, J. P., & Klein, D. A., 5th International Edition, 2002.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	http://nopr.niscair.res.in/bitstream/123456789/24929/1/IJFTR%2026%281-2%29%20202-205.pdf
2	http://nopr.niscair.res.in/bitstream/123456789/11382/1/IJMS%2040%281%29%20130-133.pdf
3	http://content.inflibnet.ac.in/data-server/eacharya-documents/53e0c6cbe413016f234436f5_INFIEP_17/31/ET/17-31-ET-V1-S1__l-31_theory_biological_assay_of_fermentation_products.pdf
4	http://nopr.niscair.res.in/bitstream/123456789/24631/1/IJFTR%2029%282%29%20239-259.pdf
5	http://nopr.niscair.res.in/bitstream/123456789/1290/1/JSIR%2066%288%29%20%282007%29%20611-614.pdf
6	http://nopr.niscair.res.in/bitstream/123456789/44961/1/IJCT%2025%284%29%20315-323.pdf
7	http://nopr.niscair.res.in/bitstream/123456789/11324/1/IJBT%202%283%29%20382-386.pdf
8	http://nopr.niscair.res.in/bitstream/123456789/24930/1/IJFTR%2026%281-2%29%20206-213.pdf
9	https://advances.sciencemag.org/content/3/5/e1601984.full
10	https://upcommons.upc.edu/bitstream/2117/131927/1/biofunctional-textiles.pdf
11	https://www.frontiersin.org/articles/10.3389/fmicb.2016.02087/full
12	http://nopr.niscair.res.in/bitstream/123456789/24930/1/IJFTR%2026%281-2%29%20206-213.pdf
Course Designed By: Dr.K.Sangeetha	

Mapping with Programme Outcomes										
Cos	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	L	L	L	L	L	S	L	L	L
CO2	S	L	L	L	L	L	S	L	L	L
CO3	L	S	S	L	M	S	S	L	L	S
CO4	L	S	S	M	S	S	S	L	L	S
CO5	S	L	L	L	S	M	S	L	L	S

*S-Strong; M-Medium; L-Low

Third Semester

Course code	33A	APPAREL QUALITY STANDARDS AND IMPLEMENTATION	L	T	P	C
Core			4	-	-	4
Pre-requisite		Basic knowledge about textile and apparel industry and quality requirements	Syllabus Version		2020-2021	

Course Objectives:

The main objectives of this course are to:

1. Study about national and international standards pertaining to textile industry.
2. Demonstrate Eco standards pertaining to fabric and apparel.
3. Study about quality management of apparel industry.

Expected Course Outcomes:

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

1	Understand the national and international standards pertaining to textile industry.	K2
2	Analyze the eco standards pertaining to fabric and apparel.	K4
3	Apply quality management in apparel industry.	K3
4	Evaluate eco-parameters of textile materials.	K5
5	Analyze inspection and pollution control in apparel industry.	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	Quality Standards	12 hours

Introduction to quality standards, importance, benefits, levels and sources of quality standards. ISO Standards for the Apparel Industry - ISO 9000 & ISO 14000 standards, OEKO Tex 100 standard, Made in Green, STeP, GOTS standards, ANSI standards, Textile Exchange standards, Cradle to Cradle certified standards.

Unit:2	Eco Parameter Testing	12 hours

Sensitizing dye stuffs, allergic dyes, carcinogenic amines, red-listed chemicals as per Eco specifications. Dry cleaning Agents, Ozone depleting chemicals, pH value, formaldehyde content, heavy metal content, Pesticides and herbicides, azo dye stuffs, Diperse dyes, Nickel, Pentachlorol

phenols, colour fasteners, brighteners, softening agents.		
Unit:3	**Quality Implementation System**	**10 hours**
SA8000 Standard, 5S, TQM, Lean manufacturing, Six Sigma lean manufacturing, The Higg Index by Sustainable Apparel Coalition (SAC), Product Life cycle management.		
Unit:4	**Inspection in Apparel Industry**	**12 hours**
Garment defects - cutting defects, sewing defects, assembly defects, pressing, finishing and packaging defects. Inspection procedures -raw materials, in process, and final inspection. Quality control in final Inspection – AQL: Levels 1.5, 2.5, 4.0, 6.5. Cost of Quality (CoQ) and customer returns.		
Unit:5	**Pollution Control**	**12 hours**
Hazardous chemicals, 11 flagship chemicals, Substances of very high concern (SVHC), Restricted Substances List (RSL), Manufacturing Restricted Substances List (MRSL). Zero Liquid Discharge (ZLD), Zero Discharge of Hazardous Chemicals (ZDHC), Detox Campaign.		
Unit:6	**Contemporary Issues**	**02 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**60 hours**

Text Books	
1	Managing Quality in Apparel Industry, Pradip V Mehta & Sathish K.Bhardwaj, New Age International, 1998.
2	Sustainability in the Textile Industry- Chapter 5 Standards and Certificates, K.Amutha, Springer Publication,2017.
3	Sustainable Fibers and Textiles – Chapter 12 Sustainable Chemical Management and Zero Discharges, K.Amutha, Woodhead Publishing, 2017.
4	Eco-testing of Apparel Products, K.Amutha, Woodhead Publishing, Green Apparels Chapter 10, 2019.
Reference Book	
1	The Fundamentals of Quality Assurance in the Textile Industry, Stanley Bernard Brahams, CRC Press, 2016.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://nptel.ac.in/courses/116/102/116102019/
2	https://www.iso.org/obp/ui/#iso:std:iso:14001:ed-3:v1:en
3	https://www.iso.org/obp/ui/#iso:std:iso:9001:ed-5:v1:en
4	https://youtu.be/_hs54V3x1VQ
Course Designed By: Dr.K.Amutha	

Mapping with Programme Outcomes										
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**

CO1	S	L	M	L	S	M	L	S	S	S
CO2	S	S	S	S	S	L	M	S	S	S
CO3	S	S	S	M	S	L	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	M	S	S	S

*S-Strong; M-Medium; L-Low

Course code	**33B**	**CLOTHING APPEARANCE AND FIT**	**L**	**T**	**P**	**C**
Core			4	-	-	4
Pre-requisite		**Basic Knowledge about clothing and fit**	**Syllabus Version**		**2020-2021**	

Course Objectives:

The main objectives of this course are to:

1. Learn about perceptions of body appearance and its relations to clothing
2. Understand the Assessment of clothing appearance and fit.
3. Know about the concepts of Virtual reality,3D Body scanning, Sizing systems
4. Recognize the need and the ability to understand cosmetic textiles
5. Understand Human Anthropometrics ,Impact of physical appearances, rejuvenating the fashion and clothing curriculum

Expected Course Outcomes:

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

1	Understand the Perceptions of body appearance and its relations to clothing	K2
2	Apply the concepts of assessment of clothing appearance and fit, Virtual Reality,3D Body scanning, Sizing systems	K3
3	Evaluate the principles of cosmetic textiles in textile industry.	K5
4	Analyse the Human Anthropometrics and systems	K3
5	Create the Impact of physical Appearance on attributions of specific traits	K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**Perception of Body Appearance and its Relation to Clothing**	**10 hours**

Introduction – Beauty - Facial attractiveness, body physical attractiveness, body image, modification of body appearance by dressing, fabric properties related to clothing appearance &

fit.

Unit:2	Assessment of Clothing Appearance	12 hours

Introduction - Assessment of fabric surface smoothness, seam appearance, crease retention, appearance retention of finished garments, and reliability of subjective assessment. Objective evaluation of fabric wrinkling, fabric pilling, seam pucker, overall garment appearance

Unit:3	Assessment of Clothing Fit	12 hours

Definition of fit - Influences on clothing fit, testing methods for dimensional fit, subject rating scales, subjective fitting guide, Virtual reality – Body cloths trial. **3-d Body Scanning** – Introduction - global development of body scanners, principles and operations of body scanning technologies, bench marking. Challenges of 3D body scanning. Garment drape - measurement of fabric drape

Unit:4	Textiles and Cosmetics	12 hours

Cosmetic Textile-Development of cosmetic textiles using microencapsulation technology-air suspension coating-pan coating-emulsion hardening process-cosmetic textile products-advantages and disadvantages**.**

Unit:5	Appearance Management Through Clothing	12 hours

Human Anthropometrics and Sizing Systems- Terms and definitions - Traditional anthropometry, Historical development of sizing system. Impact of physical appearance on attributions of specific traits –Body languages and clothes for presentations –Rejuvenating the fashion and clothing curriculum.

Unit:6	Contemporary Issues	02 hours

Expert lectures, online seminars - webinars

	Total Lecture hours	60 hours

Text Books

1	Clothing Appearance and Fit Science and Technology, J.Fan, W.Yu and Hunter, Woodhead, 2004
2	Functional Textiles for Improved Performance Protection and Health, N.Pan and G.Sun, Woodhead, 2011
3	Anthropometry Apparel Sizing and Design, Deepti Gupta and Norsaadah Zakaria, Woodhead, 2014

Reference Books

1	Fashioning Models: Image, Text and Industry, Joanne Entwistle and Elizabeth Wissinger, Bery in an Imprint Bloomsbury, 2012
2	Body Language, Allan Pease, Manjul Publishing House, 2014.
3	Fabric Testing, Jinlian Hu,Woodhead,2008

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	https://swayam.gov.in/nd1_noc19_te08/preview
2	http://ugcmoocs.inflibnet.ac.in/ugcmoocs/view_module_ug.php/145
3	http://vr.cs.uiuc.edu/vrbook.pdf

4	https://www.fiber2fashion.com/industry-article/877/e-fit-the-latest-technology-for-perfect-fit
5	https://pciaw.org/covid-19/pciaw-sizing-wardrobe-management-webinar-in-partnership-with-gerber-technology-update/
6	https://www.academia.edu/36250951/CLOTHING_FIT_AND_COMFORT_ppt
7	https://www.slideshare.net/amandeepsarao/appearance-grooming
8	https://www.slideserve.com/arne/dress-and-appearance
Course Designed By: Dr.M.Jayakumari	

Mapping with Programme Outcomes										
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	M	M	M	S	M	S	S	S
CO2	M	S	S	S	S	S	M	S	S	M
CO3	S	S	S	S	S	M	S	S	S	S
CO4	M	S	M	M	S	S	S	S	S	S
CO5	S	S	S	S	S	M	S	S	S	S

*S-Strong; M-Medium; L-Low

Course code	33C	ECO TEXTILES AND SUSTAINABILITY	L	T	P	C
Core			4	-	-	4
Pre-requisite		Basic knowledge of Textiles and Apparels	Syllabus Version	2020-2021		

Course Objectives:

The main objectives of this course are to:

1. Understand about Eco textiles and its importance.
2. Explain the types of Ecology and structure of Eco system.
3. Gain knowledge about natural fibers, dyes and finishes.
4. Learn about Eco testing and eco standards.

Expected Course Outcomes:

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

1	Understand the importance of Ecology and Structure of Eco system	K2
2	Apply various technique to extract the natural fibers for making eco textiles	K3
3	Extract and apply natural dyes and finishes for eco textiles	K6
4	Gain knowledge on Eco testing and Eco standards	K2
5	Gain knowledge on Sustainability concepts	K2

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	Eco-Textiles	10 hours

Introduction & needs for eco-textiles & its importance. Ecology - Production ecology, Human ecology & Disposal ecology**.** Structure and stability of the ecosystem. Toxicology of textile dyes. German ban on toxic dyes, chemicals and auxiliaries.

Unit:2	Natural Fibers	12 hours

Importance of natural fibers in textiles - Major fibers used in textiles - cotton, jute, linen and silk. Minor fibers used in textiles - sisal, pineapple, coir, nettle. Protein - soya, spider silk etc., Extraction or preparation methods of natural fiber-retting, & its methods, decortications by hand and machine. Recent findings of natural fibers in textile industry.		
Unit:3	**Natural Dyes**	**13 hours**
History, importance. Types of Natural dyes- plant, animals and minerals- madder, indigo, catechu, myrobalan, pomegranate, lac, alum, Extraction methods & application methods. Mordants, Mordanting types, pre, meta and post mordanting. Characteristics of natural dyed fabrics. Commercially available natural dyes, recent development in Natural dyes.		
Unit:4	**Natural Finishes**	**13 hours**
Need for natural finishes. Traditional plants & herbs used in natural finishing. Various plant Components, extraction methods and application. Recent natural finishes on textiles for various applications. Process adopted for eco-friendliness. Enzyme technology, Foam technology, Super critical carbon-di-oxide dyeing & Plasma technology – Glow-discharge method, Corona discharge ,Method & Dielectric barrier discharge method.		
Unit:5	**Eco Standards for Textiles and Sustainability**	**10 hours**
Eco Standards for Textile. Eco-Auditing and Eco-labelling, Eco mark on textiles. Sustainability - definition, history, importance, primary goals, concepts, principles and dimensions, textiles circular economy, Recycling of textiles, The connection between supply, demand and sustainability, a sustainable future.		
Unit:6	**Contemporary Issues**	**02 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**60 hours**

Text Books	
1	Eco Textiles and Sustainability, K.Sangeetha, Laser Park Publishing House, 2017
2	Sustainable Textiles: Life Cycle and Environmental Impact, Richard Blackburn, Wood head Pub.Ltd., 2009
3	Eco Textiles, Miraftab M. and Horrocks R., Wood head Pub.Ltd, Cambridge, 2007
Reference Books	
1	Biobased Products and Industries, Charis M. Galanakis, Elsevier, 2020
2	The Impact and Prospects of Green Chemistry For Textile, Shahid UI-Islam, Bhupendra Singh Butola, Elsevier, 2018
3	Environmental Aspects of Textile Dyeing, Christier.M., Woodhead Pub. Ltd, Cambridge, 2007
4	Bio-Textiles as Medical Implants, M W King, B S Gupta, Rguidoin, Woodhead Publishing, 2013
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	Textile Fibers https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=827
2	Natural Fibers https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=827
3	Natural Dyes and Mordents https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=827

4	Textile Finishing https://nptel.ac.in/courses/116102054/
5	Standards and Specifications, Eco Standards https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=827
Course Designed By: Dr.K.Sangeetha	

Mapping with Programme Outcomes										
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	M	M	M	L	M	S	L	L	M
CO2	M	S	L	M	L	M	S	L	L	M
CO3	M	M	S	M	L	M	S	L	L	M
CO4	S	M	M	M	L	M	S	L	L	M
CO5	S	M	M	M	L	M	S	L	L	M

*S-Strong; M-Medium; L-Low

Course code	**33P**	**SURFACE ENRICHMENT AND ACCESSORY MAKING**	**L**	**T**	**P**	**C**
Core - Practical			-	-	3	3
Pre-requisite		**Basic knowledge in surface enrichment and accessory making**	**Syllabus Version**		**2020-2021**	

Course Objectives:

The main objectives of this course are to:

1. Design products for printing
2. Gain knowledge about Dyeing
3. Produce smocking and embroidery
4. Samples for applique work
5. Create accessory Making

Expected Course Outcomes:

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

1	Choose printing	K1
2	Understand about dyeing	K2
3	Develop smocking and embroidery in fabrics	K3
4	Analyze applique work	K3
5	Evaluate accessory making	K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

1. **Printing** – a) Screen, Block, b) Spray, Stencil c) Texture printing by combining any three different types of textures.
2. **Dyeing** - resist & discharge - a) Tie & dye b) batik
3. **Smocking** - Smocking with different techniques.
   Embroideries - Designing and making of any three traditional embroideries
4. **Applique work**- basics, hand applique, machine applique, bias tape appliqué, reverse,

reverse applique techniques 5. **Accessory making** for special purposes (Any five) Bags , Shoes, Purse, Hats, Wallet, Umbrella, Helmet, Pouch cover, Turbans, Mobile cover.	
Total hours	**75 hours**

Text Books	
1	Indian Embroidery – It's variegated charms, Pandit, S., Latest edition. Vinu Bai Patel, Baroda, 2020.
2	The History of Costume, Kemper Rachel H, Nowsweet,1977.
3	Household Textiles and laundry work, Deulkar. D. Atmaram and sons, 1965.
4	Attractive Embroidery Designs, Ritu, Indica, 1995.
5	Embroidery, Nirmal C. Mistry, Naganeeth, 1999.

Reference Books	
1	Dress at the Court of King Henry VIII, Hayward, Maria , Maney,2007.
2	Handwoven Fabrics of India, Jyotindra Dhamija, Jasleen, Jain, Mapin, Latest edition-1989.
3	Life styles, Fashion Styles, Kathryn Samuel, Macdonald,1986.
4	Modern Embroidery: 35 stylish and contemporary hand-sewn designs Laura Strutt, CICO Books, 2019.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://digitaldefynd.com/best-jewelry-making-courses/
2	https://www.mybluprint.com/article/yes-way-applique-heres-how-to-use-it-to-boost-your-quilts-wow-factor
3	https://angelleadesigns.com/tutorials/how-to-make-and-apply-appliques/
4	https://www.youtube.com/watch?v=ORPoGK_kEiE&list=PLy4TfQu3_JVF2H9n4UC859p4pqi7FgS2i&index=185
5	https://www.youtube.com/watch?v=Sjm-0oPuwsE

Course Designed By: Dr.M.Sumithra

Mapping with Programme Outcomes										
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	S	M	M	S	S	S	S	M
CO2	S	S	S	S	M	S	M	S	S	M
CO3	S	S	S	S	S	S	S	M	S	S
CO4	M	S	S	S	M	M	M	S	L	M
CO5	S	S	S	M	M	S	L	S	S	S

*S-Strong; M-Medium; L-Low

Course code	33Q	PORTFOLIO PRESENTATION	L	T	P	C
Core - Practical			-	-	4	4
Pre-requisite		Basic knowledge in sketching and about theme selection	Syllabus Version		2020-2021	

Course Objectives:

The main objectives of this course are to:

1. Design and develop portfolio with sketches, Concept, Mood Boards on basis of theme.

Expected Course Outcomes:

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

1	Develop portfolio on par with the design /theme requirement	K2
2	Make a design collection by utilizing all designing and technical skills	K3
3	Create a portfolio for exhibiting the design collection in a creative manner.	K6
4	Develop various boards like theme board, mood board, story board, colour board, fabric swatch board, patten board and flat pattern	K6
5	Compile and present the portfolio effectively	K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Portfolio Presentation	**75 hours**

Portfolio Presentation for any 4 Theme with the following components

1. Name Board
2. Designer Profile
3. Customer Profile
4. Mood Board
5. Inspiration Board
6. Fashion Illustration – 5 (front & back sketches)
7. Colour Board
8. Fabric Board
9. Design Development / Story Board
10. Accessory Board
11. Garment Construction Board
12. Photo shoot collection board

Total hours	**75 hours**

Reference Book

1	Portfolio Presentation for Fashion Designers., Linda Tain, PDF –e BOOK
2	Portfolio Presentation for Fashion Designers Paperback, Linda Tain , Fairchild Publications 2010
3	Design Your Fashion Portfolio Paperback – 1 Steven Faerm, A & C Black Publishers Ltd**,** 2012

Related Online Content [MOOC, SWAYAM, NPTEL, Websites etc.]

1	https://www.bloomsbury.com/in/portfolio-presentation-for-fashion-designers-9781501322976/

Course Designed By: Dr.S.Grace Annapoorani

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	S	M	S	S	S	S	S	L	S	S
CO2	S	M	S	M	S	S	M	L	M	M
CO3	S	M	S	M	S	S	M	L	S	S
CO4	M	S	S	L	S	S	M	L	M	L
CO5	M	M	M	L	M	M	M	L	M	L

*S-Strong; M-Medium; L-Low

Course code	3EA	CLOTHING CARE AND MAINTENANCE	L	T	P	C
Elective			4	-	-	4
Pre-requisite		Basic knowledge on Textiles & their properties	Syllabus Version	2020-2021		

Course Objectives:

The main objectives of this course are to:

1. Know about the water types and purification
2. To learn about the maintenance of clothing and stain removal
3. Understand the care labels and packing

Expected Course Outcomes:

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

1	Gain knowledge about clothing care	K2
2	Know about various process in maintenance of clothing	K3
3	Evaluating the best method for clothing maintenance	K5
4	Create a best method for caring their wardrobe	K6
5	Study about the packing sector in textile industry	K2

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	Water and its Types	13 hours

Water- types- soft water-hard water- purification of water. Soaps, detergents – types – manufacturing – properties		
Unit:2	**Laundering**	**13 hours**
Laundering – objects – methods - laundering of white - coloured, cotton, silk, wool, synthetic fabrics, lace materials, carpets. Clothing storing- mending - darning- seasonal care.		
Unit:3	**Dry Cleaning**	**12 hours**
Dry cleaning - chemicals used - sequence - method - commercial dry cleaning. Washing machines – types - working principles.		
Unit:4	**Ironing And Pressing**	**10 hours**
Ironing and pressing - hot air, steam, permanent pressing, tumble drier –hydro extractor – working principle.		
Unit:5	**Stain Removal**	**10 hours**
Stain - classification – removal of known and unknown stains - rules in removing fresh and old stains. Stain removers - grease solvents – absorbents - washing soda - borax. Care labels – importance- symbols – uses. Packing – importance – care of import & export packing.		
Unit:6	**Contemporary Issues**	**02 hours**
Expert lectures, online seminars – webinars		
	Total Lecture hours	**60 hours**

Text Books

1	Care and Maintenance of Textile Products Including Apparel and Protective Clothing Kindle Edition by Rajkishore Nayak , Saminathan Ratnapandian, Textile Institute Professional Publications, 2018
2	Household Textile & Laundry Work by Durga Deulkar, 2011
3	Fundamentals of Textiles and their Care, by Dantyagi, 1996

Reference Books

1	How to Take Care of Your Clothes: Advice from the Ancestors, Claire Leavey Edited and Updated for Modern Living (Retro Metro Techno books) – Import, 2012
2	Field Guide to Stains: How to Identify and Remove Virtually Every Stain Known to Man Book by Melissa Wagner, Nancy Armstrong, and Virginia M. Friedman, 2002
3	Laundry: The Home Comforts Book of Caring for Clothes and Linens, Cheryl Mendelson , 2010
4	Care Labeling in Garments, R.Senthilkumar, 2016
5	Textiles and their care, Anuradha Sharma, 2010

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	Chemical Technology I – Web Course - https://nptel.ac.in/courses/103/107/103107082/

2	Water Supply Engineering https://nptel.ac.in/courses/105/105/105105201/
Course Designed By: Dr.K.Sangeetha	

Mapping with Programme Outcomes										
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	S	M	M	L	S	M	L	L
CO2	S	S	S	M	M	M	S	M	L	L
CO3	S	S	S	S	L	M	M	M	M	M
CO4	S	S	S	S	L	L	M	L	L	L
CO5	S	S	S	S	L	S	M	M	M	M

*S-Strong; M-Medium; L-Low

Course code	**3EB**	**HOME TEXTILES**	**L**	**T**	**P**	**C**
Elective			4	-	-	4
Pre-requisite		**Basic knowledge about home textile products**	**Syllabus Version**		**2020-2021**	

Course Objectives:

1. Learn about Home Textiles in India.
2. Different Types of Home Textile production and Application in seating
3. To acquire knowledge about windows
4. To understand Table and bed Linens and its types
5. To be aware of Functional requirement for the application of Home Textiles in Floor Coverings

Expected Course Outcomes:

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

1	Understand Home textiles and its products	K2
2	Evaluate different types of home textile manufacturing and applications	K5
3	Apply windows applications and end uses	K3
4	Analyze Table and bed Linens	K4
5	Evaluate Functions of Home textiles	K5

K1 – Remember; **K2** – Understand; **K3** – Apply; **K4** – Analyze; **K5** – Evaluate; **K6** – Create

Unit:1	**Home Textile in India**	**12 hours**

Home Textile in India: Introduction, history, exports – Trends in home textile industry – Domestic and Global market for home textiles, Major production centers in India.
Home Textile Products – Role of fabric in interior furnishing – Properties required – Factors affecting that selection of fabrics – Different fibers used, Standard sizes, Fabric requirement and cost calculations.

Unit:2	**Seating and Bed Linens**	**12 hours**

Seating: Structures, lay out, Range & size – Material used – Manufacturing – Double cloth – loop pile – cut pile – cushion foam – multi layer sheets – seat covers – types &materials.
Bed Linens – Definitions – design & size – Bed spread designs – chenille and organic bed spreads – dimensions – Bed sheets – types – fitted sheets – manufacturing process – bed skirts – types – mattress – domestic and international market for bed linens – pillows – Quilt:types– Machine, Hand quilting – Knotted and tied – Trapunto – Shadow trapunto – export and import contributions – process sequence for bed linen – scope in global market.Machine, Hand quilting – Knotted and tied – Trapunto – Shadow trapunto – export and import contributions – process sequence for bed linen – scope in global market.

Unit:3	**Windows and Wall Coverings**	**12 hours**

Windows: Basic sizes, Lay outs, Materials – Voiles, Nets – Sun filters – Semi sheers – Reflective textiles – Draperies – Types – Valances – Types – Shades – Types – Swags — Headings – Types- Distribution Channels – Curtains – Introduction – Types of curtains – Characteristics of curtain fabrics.
Wall Coverings: Requirements, benefits, types – carpet as wall covering – Materials and manufacturing of fabrics – Application, end use – colour concepts.

Unit:4	**Linens**	**12 hours**

Table Linens – Place mats and table cloths – Definition – Placemats – Varieties of placemats – Making process flow – Instruction – tips & warnings – Reversible placemats – Stone placemats– table cloths – Types, material &manufacturing.
Kitchen Linens – Introduction – Material used – Kitchen products – Oven mitten – Pot holder – Apron – Napkins – Doilies – Kitchen mats – Dining table cloth – teacozy–kitchen curtain– Table runner – Kitchen rugs – Types of stitches and seamsused.
Bath Linen: Categories – bath robe – Sizes & design elements – Terry towels – Classification – Ranges – Fiber used – Standard sizes – Manufacturing flow chart – Construction of terry towels Market share – Production centers.

Unit:5	**Floor Coverings**	**10 hours**

Floor Coverings: Definitions – Fiber used – Types of carpets – Comparison of carpets – broad loom carpets — Benefits of carpets and rugs – Carpet cushions – Manufacturing Process –Rugs-Types of rugs – Knots and oriental rugs – Embroidered rugs – Natural leather rugs–Advances- Earth carpets – Thinking carpets – Magic carpets – Lawn carpets.

Unit:6	**Contemporary Issues**	**02 hours**
Expert lectures, online seminars – webinars		
	Total Lecture hours	**60 hours**

Text Books

1	Home Textiles, Gopalakrishnan.D and T.Karthik, Astral. 2020
2	Performance of Home textiles, Subrata Das, Woodhead, 2010

3	Traditional Knowledge of Household, Ghosh, Ashis Kumar, Daya, 2011.
4	Home furnishing,V.Ramesh Babu, S.Sunderesan,Woodhead, 2018.
5	Performance of Home Textiles, Subrata Das, Woodhead, 2018.
Reference Books	
1	Inside Today's Home Hot, Rinehart and Winston, Faulkner 1965.
2	Home Management, Varghese, M.A., Ogale, M.M, and Srinivasan , K., New Age Internationa,2017.
3	Interior Design and Decoration', Premavathy, Parveen Pannu, CBS Publishers and Distributors 1st Edition, 2013
4	Art in Every Day Life, Harriet Goldstein, Goldstein Press, 2007
5	Know Your Home Furnishings, Virginia Hencken Elsasser and Julia Sharp, Fairchild Books; 2nd Edition, 2016.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=827
2	https://shodhganga.inflibnet.ac.in/bitstream/10603/102467/11/11_chapter%203.pdf
3	https://www.businesswireindia.com/welspun-secures-patent-for-new-line-of-augmented-reality-home-decor-50283.html
4	https://textilelearner.blogspot.com/2014/08/fabrics-for-interior-home-textile.html
5	https://www.fiber2fashion.com/industry-article/84/home-textiles-market-in-asia
6	https://ihmkolkata.blogspot.com/2013/05/wall-coverings.html
Course Designed By: Dr.M.Sumithra	

Mapping with Programme Outcomes										
Cos	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	S	S	M	S	M	M	S	M
CO2	M	L	M	L	L	S	M	S	S	M
CO3	M	S	S	M	M	S	M	S	S	M
CO4	S	S	S	M	M	S	M	S	M	S
CO5	S	M	S	S	L	S	S	M	S	M

*S-Strong; M-Medium; L-Low

Course code	3EC	NANOTECHNOLOGY IN TEXTILES	L	T	P	C
Elective			4	-	-	4
Pre-requisite		Any science degree	Syllabus Version		2020-2021	

Course Objectives:

The main objective of this course is to:

1. Provide an insight about the basics of nanotechnology and to guide the students to apply nanotechnology techniques in various textile applications.

Expected Course Outcomes:

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

1	Remember the basics of Nanoscience, and textile structures and its applications in textiles.	K1
2	Understand the technological production of nanofibers.	K2

3	Apply the knowledge of Nano particles , Carbon Nanotubes and Nano Composites for various Textiles end use	K3
4	Get familiarized with the new concepts of Nanocoatings and Surface Modification Techniques	K4
5	Evaluate and create nano based textile products for various applications	K5&K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**Nanoscience, and Textile Structures**	**12 hours**

Nanoscience –Introduction-evolution of nanotechnology-history of nanomaterials-definition of nanomaterials – one, two and three dimensional nanomaterials – Natural nanomaterials
Synthesis of nanomaterials: Top-down and bottom-up approaches – "green" synthesis of nanoparticles.
Properties: Size dependent properties.

Unit:2	**Nano fibre Production and Properties**	**12 hours**

Electrospinning – Working Principle – Instrumentation - Parameters - types of electrospinning – Multi-jets from single needle**,** Multi-jets from multiple needles, Multi-jets from needleless systems

Potential approaches - Bubble electrospinning – Electro blowing - Electrospinning by porous hollow tube- Electrospinning by microfluidic manifold- Roller electrospinning- Melt electrospinning

Electro conductive, antistatic, Anti-bacterial and anti-microbial, self- sterilizing Durable/ Anticorrosive, Moisture absorbent, Self- cleaning/ dirt and water repellent, UV protective, Fireproof and Flame retardant, Nano-filtration, Fragrence and odor control, Stain Resistive, Improved tensile strength.

Unit:3	**Nano particles , Carbon Nanotubes and Nano composites in Textiles**	**12 hours**

Nano particles - Preparation of nano-sized materials- Vapour phase reaction- commercially nano-particles- metals and metal oxides nano-particles- polymer and polymer nano-composites- Clay nano-particles, carbon nano particles-polymer nano-whiskers.
Nano-particles in functional textile finishing- Wrinkle resistance- stain resistance- water repellency- anti-static performance- anti-bacterial effect- ultra violet protection.
Carbon nanotubes: structure and properties- synthesis- electric arc discharge- laser ablation method- chemical vapor deposition- nanotube purification-applications of carbon nanotubes in textile and its related products.
Nano-composites: Classification of nanocomposites- Non-polymer based nanocomposites, polymer based nanocomposites.

Unit:4	**Nanocoatings and Surface Modification Techniques**	**12 hours**

Introduction to Nanocoatings: Importance of nanocoatings- finding the perfect solvent, applications of nanocoatings.
Abrasion & wear resistant Nanocoatings -Thermal barrier and flame retardant Nanocoatings-Anti-microbial Nanocoatings: Thermal barrier and flame retardant Nanocoatings**.**

Unit:5	**Nanomaterials for Textiles and Cosmetics Applications**	**10 hours**

Textiles - Nano-filled polypropylene fibers -Bionics- Swim-suits with shark-skin-effect, Soil repellence, Lotus effect – Nano finishing in textiles (UV resistant, antibacterial, hydrophilic, self-cleaning, flame retardant finishes) -Modern textiles; Lightweight bulletproof vests and shirts, Color changing property, Waterproof and Germ proof, Cleaner kids clothes, wrinkle free, Wired and Ready to Wear. Military textiles
Cosmetics – Formulation of Gels, Shampoos, Hair-conditioners (Micellar self-assembly and its manipulation) -Sun-screen dispersions for UV protection using Titanium oxide – Color cosmetics

Unit:6	**Contemporary Issues**	**02 hours**

Expert lectures, online seminars – webinars

Total Lecture hours	**60 hours**
Text Books	
1	Brown, P.J., Stevens, K.: Nanofibers and Nanotechnology in Textiles. Woodhead Publishing Limited, Cambridge, 2007
2.	Ramakrishna, S., Fujihara, K., Teo, W.E., Lim, T.C., Ma, Z.: Electrospinning and Nanofibers. World Scientific Printers, Singapore, 2005
3.	Alfred Ruiden, Elements of Polymer Science and Engineering, Elsevier Science, 1998.
4.	Mahltig B.,Textor T., "Nanosols & textiles", World scientificpublishers, 2012
Reference Books	
1.	Nanocomposites - New Trends And Developments Edited by Farzad Ebrahimi, Published by InTech, 2012
2.	Mai Y-W., "Polymer Nano composites", Wood head publishing, 2006
3.	See ram Ramakrishna, "An introduction to electro spinning and Nanofibers", World Scientific Publishing Co, 2005
4.	Chang W.N., "Nanofiber fabrication, performance and applications", Nova Science, 2009
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://www.coursera.org/learn/nanotechnology
2	https://www.udemy.com/course/nanotechnology/
3	https://textilecourse.blogspot.com/2020/01/application-nanotechnology-textile.html
4.	https://www.my-mooc.com/en/categorie/nanotechnology
5.	https://technicaltextile.net/articles/nano-textiles-2968
6.	www.nanophase.com
7.	www.ccmr.comell.edu
8.	www.nanotex.com
9.	www.azonano.com
10.	www.nQl.co.uk
11.	https://www.nanowerk.com/spotlight/spotid=19451.php
Course Designed By: Dr.S.Grace Annapoorani	

Mapping with Programme Outcomes										
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	S	S	S	S	S	S	L	S
CO2	S	M	M	S	M	M	M	S	L	S
CO3	S	M	M	M	S	M	M	L	L	S
CO4	S	M	S	M	M	M	M	L	L	S
CO5	S	M	S	S	S	S	S	S	L	S

Fourth

Course code	43P	CAD IN TEXTILE DESIGNING	L	T	P	C
Core - Practical			-	-	4	4
Pre-requisite		Basic knowledge about computer aided textile design	Syllabus Version		2020-2021	

Course Objectives:

The main objectives of this course are to:

1. Learn about Textile Weaves
2. Implementation of weaves on designed garments.
3. Design the Motifs for Home textiles.
4. Learn about 3D studios softwares.
5. Application of developed designs using software.

Expected Course Outcomes:

On the successful completion of the course, student will be able to:		
1	Understand the Basics of TUKA Software	K2
2	Apply the classification of Textile Weaves	K3
3	Evaluate and Designing the weaves using CAD	K5
4	To create Textile motifs using Tuka Cad	K6
5	To create a Textile designing project using tuka cad software	K6
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		
1. To Draft pattern of the garments for Men, Women and children. 2. To Draft pattern of the designed garments and Pattern layout using tuka software 3. To analyse the marker efficiency of the drafted pattern using specification sheet 4. Designing fabrics for Plain, Rib, Twill, Satin and Sateen Weaves. 5. To create the Dobby and Jacquard Weave using Tuka software.		
Total hours		**75 hours**
Text Books		
1	CAD in Clothing and Textiles Paperback, Winifred Aldrich Import, 1994	
2	Woven Textile Design, Jan Shenton, Published by Laurence King Publishing, 2014	
3	Dress Pattern Designing: The Basic Principles of Cut and Fit**,** Natalie Bray, BSP Professional Books, 1986.	
Reference Books		
1	Pattern cutting and Making up**,** Martin Shoben and Janet P Ward, 1987.	
2	Designing Patterns – A Fresh Approach to Pattern Cutting**,** Hilary Campbell, 1980.	
3	The Complete Technology Book on Textile Spinning, Weaving, Finishing and Printing (2nd Revised Edition) Paperback – 1, NIIR Board of Consultants & Engineers, 2016	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
1	https://swayam.gov.in/nd2_nou20_cs15/preview	
2	http://www.nptelvideos.in/2012/12/computer-aided-design.html	
3	https://www.cita.org.hk/en/event/free-webinar-on-how-to-present-the-3d-garment/	
4	https://www.youtube.com/watch?v=1aagPr6vJ04	
5	https://www.slideshare.net/BusinessVibes_Network/textile-webinar	
Course Designed By: Dr.M.Jayakumari		

Mapping with Programme Outcomes										
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**
CO1	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	S	S
CO5	S	S	S	S	S	S	S	S	S	S

*S-Strong; M-Medium; L-Low

Supportive

Course code	GS88	CLOTHING CARE	L	T	P	C
Supportive			2	-	-	2
Pre-requisite		Any UG Degree	Syllabus Version	2020-2021		

Course Objectives:

The main objectives of this course are to:

1.To Learn about classification of Textile Fibers and their characteristics
2.To learn about wardrobe planning
3. Different types of washing care for the various materials
4.Stain removal and its classification
5. Requirement for the care labeling system

Expected Course Outcomes:

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

1	Remember about Textile Fibers and their characteristics	K1
2	Understand about wardrobe planning	K2
3	Select care Labeling system and its uses	K3

4	Classify stain removal and principles	K4
5	Evaluate Care Labels	K5

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**Textile Fibers**	**5 hours**

Textile Fibers: Introduction, Classification, General care of different fibers – Cotton, linen, wool, silk, nylon, polyester, acrylics, rayon, acetate

Unit:2	**Wardrobe**	**5 hours**

Wardrobe - Definition and wardrobe planning. **Clothing Selection-** Factors to be considered for clothing selection.

Unit:3	**Laundering**	**6 hours**

Laundering: Water, detergents, laundry equipments – Household and commercial, laundry procedure for various fiber fabrics – Cotton and linen, woolens, silk and synthetics.
Dry Cleaning: Definition, dry-cleaning operations and materials.

Unit:4	**Stain Removal**	**6 hours**

Stain Removal: Identification and classification of stains, general procedures of stain removal, principles of stain removal, classification of stain removers.

Unit:5	**Care Labels**	**6 hours**

Care Labels: Various systems of care labelling, washing, bleaching, drying, ironing, and dry-cleaning instructions. Placement of labels on garments.

Unit:6	**Contemporary Issues**	**02 hours**

Expert lectures, online seminars - webinars

Total Lecture hours	**30 hours**

Text Books

1	Care and Maintenance of Textile Products Including Apparel and Protective Clothing, Rajikishore Nayak and Saminathan Ratnapandian, CRP press, 2018.
2	Fabric Care**,** D. Noemia Souza, New AgeInternational, 1998.
3	Fundamentals of Textiles and their Care,Susheela Dantygai , Orient Longmann, 1980.
4	Family Clothing -Tate of Glession, John Wiley & Sons I n c, Illinois, 1996.

Reference Books

1	Household Textiles and Laundry Work,–Durga Duelkar, Amla ram & Sons,2001
2	Textiles fabrics and their Selection, Wingate I B, Prentice-Hall, Inc, 1946.
3	Science in clothing comfort, Apurba das and R.Alagirusamy,woodhead,2010.
4	Clothing Care Manual, Isabel Makwara Mupfumira, NyaradzoJinga, Strategic Book,2014.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	https://syam-uat-node2.appspot.com/cec_practicecourse33/preview

2	https://www.classcentral.com/course/swayam-textile-study-4327ttps://www.vuframe.com/industries/fashion/
3	http://ugcmoocs.inflibnet.ac.in/ugcmoocs/view_module_ug.php/130https://www.coatsrmation-Hub/Care-Labels#The_International_Care_Labelling_System
4	https://www.youtube.com/watch?v=gUk7h3nQ4KY
5	http://www.ctc-phaseout.com/Stain-Removal-TA.pdf
6	https://sewguide.com/fabric-care-symbols/
Course Designed By: Dr.M.Sumithra	

Course code	**GS113**	**SUSTAINABLE FASHION**	**L**	**T**	**P**	**C**
Supportive			2	0	0	2
Pre-requisite		**Any UG Degree**	**Syllabus Version**		**2020-2021**	

Course Objectives:

The main objectives of this course are to:

1. Learn about sustainability of Fashion industry.
2. Learn about ethical fashion.
3. Learn about Eco textiles and Eco friendly fashion labels.

Expected Course Outcomes:

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

1	Understand sustainability of fashion industry.	K2
2	Analyze ethical fashion.	K4

3	Analyze eco-textiles and eco-friendly fashion labels.	K4
4	Evaluate sustainable fashion products.	K5
5	Create upcycled / downcycled products.	K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	**Sustainability in Fashion**	**6 hours**

Introduction: Fashion, Sustainability, Pillars of sustainability, Sustainable fashion – meaning and importance.

Unit:2	**Fashion and Clothing**	**5 hours**

Clothing lifecycle, clothing care, fast and slow fashion, clothes repair and re-use

Unit:3	**Ethical Fashion**	**6 hours**

Concepts of recycling and upcycling. Carbon footprint, water footprint and energy consumption of fashion industry.

Unit:4	**Green Consumerism**	**6 hours**

Eco-textiles, green consumerism and waste reduction, consumer responsibility towards sustainable fashion. 3Rs – Reduce, Reuse and Recycle.

Unit:5	**Sustainable Fashion Brands and Labels**	**5 hours**

Sustainable fashion designers, sustainable fashion brands, Eco-friendly fashion labels

Unit:6	**Contemporary Issues**	**02 hours**

Expert lectures, online seminars - webinars

Total Lecture hours	**30 hours**

Text Books

1	Sustainable Fashion Handbook, Black, S, Thames and Hudson, 2013.
2	Re-Fashioned- Cutting Edge Clothing from Upcycled Materials, Brown S, Lawrence King Publishing, 2013.
3	Fashion and Sustainability-Design for Change, Fletcher K, Lawrence King Publishing, 2012.

Reference Books

1	Cut up Couture- Edgy Upcycled Garments to Sew, Yamase K, Interweave, 2012.
2	Sustainable Fashion and Textiles- A Design Journey, Fletcher K, Lawrence King Publishing, 2008.
3	Sustainable Luxe- A Guide to Feel Good Fashion, Phillips J, Create Space Publishing, 2013.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	https://www.coursera.org/learn/sustainable-fashion
2	https://www.edx.org/course/circular-fashion-in-a-sustainable-clothingindustry
3	https://www.my-mooc.com/en/mooc/sustainable-fashion/
4	https://www.sustainablefashionmatterz.com/what-is-sustainable-fashion

Course Designed By: Dr.K.Amutha

Course code	GS17	FASHION CONCEPTS	L	T	P	C
Supportive			4	-	-	4
Pre-requisite		Any UG Degree	Syllabus Version		2020-2021	

Course Objectives:

The main objectives of this course are to:

1. Understand and adapt the ethics of fashion
2. Design and apply the fashion techniques
3. Understand the colour harmony in fashion design
4. Create their designs based on the inspirations.
5. Evaluate the design created based on the principles of design.

Expected Course Outcomes:

On the successful completion of the course, student will be able to:		
1	Apply and exhibit the ethics of fashion	K3
2	Apply the fashion and designing techniques	K3
3	Analyse the colour harmony in fashion design	K3
4	Create garment designs based on the Elements of Design	K6
5	Evaluate Application of colour and Principles of design in dress	K5
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Unit:1	**Fashion and Style**	**11 hours**
Definition –Fashion, style, fad and classic. Color chart-Prang colour chart, Value chart and Intensity chart		
Unit:2	**Elements of Design**	**12 hours**
Illustrate garment designs for the Elements of Design –Line, Colour, Texture, Shape or Form and Size		
Unit:3	**Principles of Design**	**12 hours**
Illustrate garment designs for the Principles of Design - Balance in dress, Harmony in dress, Emphasis in dress, Proportion in dress and Rhythm in dress		
Unit:4	**Colour Harmony**	**12 hours**
Illustrate the Colour Harmony in Dress Design -Monochromatic colour harmony, Analogous colour harmony, Complimentary colour harmony, Double Complimentary colour harmony, Split Complimentary colour harmony and Triad colour harmony		
Unit:5	**Application of Colour and Principles of Design in Dress**	**11 hours**
Application of colour and Principles of design in dress - Harmony through colour, Emphasis through colour, Proportion through colour, Rhythm through colour and Balance through colour.		
Unit:6	**Contemporary Issues**	**02 hours**
Expert lectures, online seminars - webinars		
	Total Lecture hours	**60 hours**

Text Books

1	Elements of Fashion and Apparel Design By, G. J. Sumathi, New Age International, 2007
2	Art in everyday life, Harriet Goldstein, Macmillan, 2007.
3	Fashion design, The art of style, Jen Jones, Capstone, 2007.

Reference Books

1	Costumes throughout the Ages, Charlotte Chilton, Feb 21, 2020.
2	History of Costume (World of culture), Rachel H. Kemper, News week, 1977.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]

1	http://ugcmoocs.inflibnet.ac.in/ugcmoocs/view_module_ug.php/145
2	https://onlinecourses.nptel.ac.in/noc20_hs81/preview
3	https://onlinecourses.nptel.ac.in/noc20_de01/preview
4	https://slideplayer.com/slide/1521307/
5	https://slideplayer.com/slide/1521626/
6	https://www.pinterest.ca/
7	https://www.slideshare.net/NanoMarkets/smart-textile-markets-20162023-slides
Course Designed By: Dr.M.Jayakumari	

JOB ORIENTED CERTIFICATE COURSE

Fashion Designer (AMH/Q1201), NSQF Level 5	
Name of the Department	Textiles and Apparel Design
Name of the Faculty Member i/c With Complete Address with Phone and e-mail	**Dr. K. Amutha,** Assistant Professor, Dept. of Textiles and Apparel Design, Bharathiar University, Coimbatore – 46 Email: amuthatad@buc.edu.in Mb: 9159440734
Inter / Intra Department Course	Inter/Intra Department Course
Duration of the Course	60 hours
Eligibility	12th Standard
Number of Candidates to be Admitted	25
Mode of the Course	Regular
Collaboration with Company (if Yes, Full Address of the Company Address , Name of the Contact Person, Phone, e-mail etc.)	K.P.R Mill Limited 'Corporate Office', Shrivari Srimat, 1045, Avinashi Road, Coimbatore - 641 018 Phone : 0422-2207777 (50 lines) Fax : 0422 – 2207778
Registration Procedure	

Job Opportunities: Designer in apparel industry, freelance designer, fashion boutique.

The objectives of the Course are:

The main objectives of this course are to:

1	Learn fashion designing concepts.
2	Understand elements of fashion.
3	Develop new designs.
4	Understand and implement the design development process.
5	Follow the national and international requirements in designing.

Course Content	Lecture & Internship	
Module 1	Fashion design research & Determine key criteria for design brief-key criteria for design brief. (theory)	**4 hours**
Module 2	Internship	**8 hours**
Module 3	Confirm design-Specify design-Implement design. (theory)	**4 hours**
Module 4	Internship	**8 hours**
Module 5	Design development process-design development process. (theory)	**4 hours**
Module 6	Internship	**8 hours**
Module 7	The work area, tools and machines and computers. (theory)	**4 hours**
Module 8	Internship	**8 hours**
Module 9	Health, safety and security requirements at work. (theory)	**4 hours**
Module 10	Internship	**8 hours**

Books

1	Fashion Design Course, Steven Faerm, Barron's, 2010.

2	Fashion Design Essentials, Jay Calderin, Rockport Publishers, 2012.
References	
1	How to be a Fashion Designer, Lesley Ware, TikiPapier, Dorling Kindersley Limited, 2018.
2	The Fundamentals of Fashion Design, Richard Sorger, Jenny Udale, AVA Publishing, 2006.
Related Online Contents	
1	https://www.coursera.org/learn/fashion-design
2	https://www.edx.org/professional-certificate/hkpolyux-fashion-design-and-creation
3	https://www.oxfordhomestudy.com/courses/fashion-courses-online/fashion-designing-online-courses-free
4	https://www.arts.ac.uk/subjects/fashion-business/short-courses/fashion-management/fashion-trend-forecasting-online-short-course-lcf

JOB ORIENTED CERTIFICATE COURSE

Assistant Designer – Home Furnishing (AMH/1220), NSQF Level 4	
Name of the Department	Textiles and Apparel Design
Name of the Faculty Member i/c With Complete Address with Phone and e-mail	**Dr. K. Amutha**, Assistant Professor, Dept. of Textiles and Apparel Design, Bharathiar University, Coimbatore – 46 Email: amuthatad@buc.edu.in Mb: 9159440734
Inter / Intra Department Course	Inter/Intra Department Course
Duration of the Course	60 hours
Eligibility	12th Standard
Number of Candidates to be Admitted	25
Mode of the Course	Regular
Collaboration with Company (if Yes, Full Address of the Company Address , Name of the Contact Person, Phone, e-mail etc.)	K.P.R Mill Limited 'Corporate Office', Shrivari Srimat, 1045, Avinashi Road, Coimbatore - 641 018 Phone : 0422-2207777 (50 lines) Fax : 0422 – 2207778
Registration Procedure	
Job Opportunities: Designer in home furnishing industry, freelance designer.	
The objectives of the Course are:	
The main objectives of this course are to:	
1	Understand trends in design development.
2	Apply knowledge of fabrics, trims and accessories for selection of suitable materials.
3	Develop proto sample with tech pack.
4	Understand and implement the design development process.
5	Learn the industry and organizational requirements.
Course Content	Lecture & Internship

Module 1	Research on design trends and consolidating forecast to develop design. (theory)	**4 hours**
Module 2	Internship	**8 hours**
Module 3	Fabrics, trims and accessories based on attribute making them suitable for the product class that is to be developed	**4 hours**
Module 4	Internship(theory)	**8 hours**
Module 5	Proto sample -Techpack, developing proto sample and getting it approved (theory)	**4 hours**
Module 6	Internship	**8 hours**
Module 7	Design development processes and Complete documentation of design development processes. (theory)	**4 hours**
Module 8	Internship	**8 hours**
Module 9	Hazards and risks associated with the process, medical emergencies	**4 hours**

	and evacuation process. Industry and organizational requirements. (theory)	
Module 10	Internship	**8 hours**

Books	
1	Fashion Design Course, Steven Faerm, Barron's, 2010.
2	Fashion Design Essentials, Jay Calderin, Rockport Publishers, 2012.
References	
1	How to be a Fashion Designer, Lesley Ware, TikiPapier, Dorling Kindersley Limited, 2018.
2	The Fundamentals of Fashion Design, Richard Sorger, Jenny Udale, AVA Publishing, 2006.
Related Online Contents	
1	https://www.coursera.org/learn/fashion-design
2	https://www.edx.org/professional-certificate/hkpolyux-fashion-design-and-creation
3	https://www.oxfordhomestudy.com/courses/fashion-courses-online/fashion-designing-online-courses-free
4	https://www.arts.ac.uk/subjects/fashion-business/short-courses/fashion-management/fashion-trend-forecasting-online-short-course-lcf

Value Added Course

VALUE ADDED COURSES

AYURVASTRA	
Name of the Department	**Textiles and Apparel Design**
Name of the Faculty Member i/c With Complete Address with Phone and e-mail	**Dr.K.SANGEETHA,** Professor and Head, Textiles and Apparel Design, Bharathiar University, Coimbatore. 9894013466 sangeethatad@buc.edu.in
Inter / Intra Department Course	Inter / Intra Department Course
Duration of the Course	40 hours
Eligibility	Any graduates
Number of Candidates to be Admitted	25
Registration Procedure	By contacting the department through email or in person.

Job Opportunities:

1. Can become a producer of Ayurvastra, and sell it to customers.
2. Can become a producer of Ayurvastra, and supply to Ayurvastra shops.
3. Can work as a technical guide in Ayurvastra producing industries.

The objectives of the Course are:

The main objectives of this course are to:

1	To learn about Ayurvastra and their medicinal values, Role of ayurvastra in health care.
2	To learn about Herbs used for ayurvastra and their components and its qualities.
3	To learn about the production of Ayurvastra.

Course Content	Lecture / Practical / Project / Internship

Module 1	Ayurvastra and their medicinal values, Role of ayurvastra in health care (theory)	**3 hours**
Module 2	Herbs used for ayurvastra and their components and its qualities (theory)	**3 hours**
Module 3	Collection and preparation methods of various materials for making ayurvastra. (practical)	**6 hours**
Module 4	Preparation of fabric for making ayurvastra and its types (theory)	**2 hours**
Module 5	Preparation of fabric for making ayurvastra (practical)	**5 hours**
Module 6	Kasayam preparation methods and making ayurvastra (theory)	**3 hours**
Module 7	Kasayam preparation and making ayurvastra (practical)	**7 hours**

Module 8	Finishing methods of ayurvastra (theory)	**3 hours**
Module 9	Finishing ayurvastra (practical)	**5 hours**
Module 10	Usage, Packing and care of Ayurvastra(theory)	**3 hours**

Books

1	Ayurvastra -- A Fabric For Natural Healing, Dr. (Mrs.) Farida P. Minocheherhomji, Laxmi book publication, Maharastra, ISBN -9781365231414.
2	Rasayana: Ayurvedic Herbs for Longevity and Rejuvenation, Puri, H. S. Taylor & Francis, London, 2003.

References

1	Ayurvastra: A Way to Sustainable Living, Aggarwal R Trends Textile Eng Fashion Technol. 1(1).TTEFT.000501. DOI: 10.31031/TTEFT. 01.000501, 2018.
2	Ayurvastra – Herbal Clothing (A new technology to heal naturally), Jyothirmai S, Sasmita Panda, Vol-2 Issue-4 2016 IJARIIEISSN(O)-2395-4396, 2016
3	Ayurvastra: A miracle mediherbal cloth, Mamta, Rani Anita, International Journal of Phytomedicines and related industries, Vol. 7 Issue 1, 2015
4	A survey of Ayurvedic Textile- ayurvastra, Rachit Bhatnagar, Dr. V.P. Singh international journal of innovative research in technology(www.ijirt.org) , ISSN: 2349-6002, volume 4 ,issue 2 ,page(s):281-283, :ijirt144716_paper.pdf, 2017

VALUE ADDED COURSE

AARI EMBROIDERY		
Name of the Department	**Textiles and Apparel Design**	
Name of the Faculty Member i/c With Complete Address with Phone and e-mail	**Dr.S.Grace Annapoorani** Professor, Dept .of Textiles and Apparel Design, Bharathiar University, Coimbatore-46 9500509797 gracetad@buc.edu.in	
Inter / Intra Department Course	Inter / Intra Department Course	
Duration of the Course	40 hours	
Eligibility	Any graduates	
Number of Candidates to be Admitted	25	
Registration Procedure	By contacting the department through email or in person	
Job Opportunities: Independent entrepreneur, Aari designer , Embroidery Designer		
The objectives of the Course are:		
The main objectives of this course are to:		
1	Enable the trainees to learn basics in embroidery.	
2	Design and develop wedding / party wears ,garments	
3	Get well trained in Aari Embroidery	
4	Develop wall hangings, bags and other products using Aari embroidery stitches.	
5	Enhance their employability skills	
Course Content	Practical / Project / Internship	
Module 1	Punching, Design Transforming and Tracing methods	**4 hours**
Module 2	Basic Stitches for Hand Embroidery	**6 hours**
Module 3	Hand Aari- Practice of frame fitting for hand aari	**4 hours**
Module 4	Practicing of locking, starting and finishing and chain stitch	**4 hours**
Module 5	Types of hand aari stitches	**10 hours**
Module 6	Practicing zardozi / embellishment (tikli, gota, patti, kundan, pipes, makaish)	**12 hours**
Book		
1	Aari Embroidery Designs Book - Mirror Work Tracing Neck Designs for Blouses and Kurtis, Narmatha, Ganga Publisher Ltd, 2010	
Reference		
1	Embroidery Designs, Nirmala C Mistry, KRF publications New Delhi, 1999	
Related Online Contents		
1	http://aarinaari.com/	
2	https://bharatskills.gov.in/pdf/E_Books/SOT1sem_TT.pdf	

3	http://www.dsource.in/resource/aari-hand-work

VALUE ADDED COURSE

MURAL PAINTING	
Name of the Department	**Textiles and Apparel Design**
Name of the Faculty Member i/c With Complete Address with Phone and e-mail	**Dr.M. Sumithra** Assistant Professor, Dept. of Textiles and Apparel Design, Bharathiar University, Coimbatore – 46 Mb: 8870233330 Email: sumitad@buc.edu.in
Inter / Intra Department Course	Inter / Intra Department Course
Duration of the Course	40 hours
Eligibility	Any graduates
Number of Candidates to be Admitted	25
Registration Procedure	By contacting the department through email or in person
Job Opportunities: Entrepreneur, Graphic Designer, Boutique Manager, Fashion Designer	
The objectives of the Course are:	
The main objectives of this course are to:	
1	Show Kerala mural
2	Demonstrate mural painting
3	Develop painting
4	Analyze different design
5	Prove design on garments
Course Content	Lecture / Practical / Project / Internship

Module 1	Colour theme of Kerala mural, its application(theory)	**4 hours**
Module 2	The basic designs and their application(theory)	**4 hours**
Module 3	Painting the basic patterns on cloth	**4 hours**
Module 4	Painting a peacock on cloth	**4 hours**
Module 5	Painting a ladies face on cloth	**4 hours**
Module 6	Painting God ‘s face on a cloth	**4 hours**
Module 7	Painting a swan on a silk cloth (a dark coloured cloth)	**4 hours**
Module 8	Painting a design on a cloth bag	**4 hours**

Module 9	Painting a design on a canvas	**4 hours**
Module 10	Painting directly on a shirt or any garment	**4 hours**

Books	
1	Glimpses of Nazraney Heritage,O Menachery, George, Saras, 2005.
2	Temple Arts of Kerala: A South Indian Tradition. ,Bernier, R. M, New S. Chand. 1982.
References	
1	Uses of Plants and Plant Products in Traditional Indian Mural Paintings,KNayar, T. S.; Binu, S.; Pushpangadan, ". *Economic Botany*.1999.
2	Indian court painting, 16th-19th century.,Kossak, Steven, The Metropolitan Museum of Art, 1997.
Related Online Contents	
1	https://www.pinterest.com/pin/551831760587206315/
2	https://www.livehistoryindia.com/living-history/2019/07/17/the-vibrant-murals-of-kerala
3	http://keralamuralpainting.com/

VALUE ADDED COURSE

KALAMKARI	
Name of the Department	**Textiles and Apparel Design**
Name of the Faculty Member i/c With Complete Address with Phone and e-mail	**Dr.M.Jayakumari,** Assistant Professor, Department of Textiles and Apparel Design, BharathiarUniversity,Coimbatore. Email: jkkumaritad@buc.edu.in Ph:9500360911
Inter / Intra Department Course	Inter Department course
Duration of the Course	40 hrs
Eligibility	UG Degree
Number of Candidates to be Admitted	25
Registration Procedure	By contacting the department through email or in person
Job Opportunities: Entrepreneur, own boutique, Retailers, Entrepreneur, Own boutique, Retailers and Fashion designers.	
The objectives of the Course are:	
The main objectives of this course are to:	
1	Understand our culture and textiles that was practiced from generations to generations.
2	Evaluate and adopt a craft and bring to the forefront of modern world and mainstream home and lifestyle fashion.
3	Analyse the Traditional crafts which have often been described as historically eco sensible.
4	Dealt with conversion of materials into products, using primarily hand skills with simple tools.
5	Employ the local traditional wisdom.
Course Content	Lecture / Practical / Project / Internship

Module 1	An opportunity to learn two distinctive styles of kalamkari art in India(theory)	**4 hours**
Module 2	The Magical Kalam made of bamboo dipped in to the dye solution, creates calligraphic effect, since the fabric belongs to painted textiles, one can explore self through connecting with tradition.(theory)	**4 hours**
Module 3	Create a Kalamkari fabric which is also known as healing fabric,	**4 hours**

	as the colors, motifs, compositions and the narration of magical forms create an aura that heals an individual physically and spiritually	
Module 4	Evaluate its sustainability and to learn its harmless environment and surrounding.	**4 hours**
Module 5	Create Kalamkari designs which are drawn generally by free hand using a pen and further the filling is also completely done with hand.	**4 hours**
Module 6	Create Kalamkari art which is generally done using earthy colors like mustard, indigo, rust, green and black.	**4 hours**
Module 7	Kalamkari on clothes use natural and mineral dyes. They are both hand painted and block printed on clothes. Besides, it is also involves weaving..	**4 hours**
Module 8	The typical Kalamkari art has figures with round shapes and border designs	**4 hours**
Module 9	Three styles of kalamkari namely the kalahasti, the machlipatnam style and the karrupur style	**4 hours**
Module 10	Kalamkari paintings have also hit the fashion industry. Its unique effect is used in garments, bedsheets, curtains etc.	**4 hours**

Books

1	Kalamkari & traditional design heritage of indiapaperback – 1, 2007
2	Design Resource Kalamkari Work - Srikalahasti Hand Painted Stories, Prof. BibhuduttaBaral, Divyadarshan C. S. and Tejesh J. NID Campus, Bengaluru

References

1	Kalamkari, the Art of Painting with Natural Dyes,Sharad Chandra Independent Researcher
2	Retracing Kalamkari's journey: from classic to a contemporary textile art Soma GhoshSalar Jung Museum, Hyderabad, Ministry of Culture, Govt. of India.

Related Online Contents

1	http://www.dsource.in/resource/kalamkari-work-srikalahasti
2	www.dsource.in
3	https://issuu.com/shefalika/docs/kalamkari_coffee_table_book

Annexure

M. Sc. TEXTILES AND APPAREL DESIGN

Syllabus

(With effect from 2020-2021)

Program Code: TEXA

DEPARTMENT OF TEXTILES AND APPAREL DESIGN
Bharathiar University
(A State University, Accredited with "A" Grade by NAAC and
13th Rank among Indian Universities by MHRD-NIRF)
Coimbatore 641 046, INDIA

BHARATHIAR UNIVERSITY, COIMBATORE - 641046

DEPARTMENT OF TEXTILES AND APPAREL DESIGN

MISSION

- To serve as a knowledge and skill hub for the professional development of students.
- To impact theoretical and practical training in advanced areas of Textiles and Apparel studies.
- To serve the textile industry and the society with creative research outcomes for further developments.
- To develop the competency of students in textiles and apparel for their excellence in career.

List of SWAYAM / MOOC /NPTEL Online Courses

S.NO	COURSE NAME	DURATION	CREDITS
1.	NPTEL- Science of Clothing Comfort	4 WEEKS	6
2.	Organic Farming For Sustainable Agricultural Production	4 WEEKS	4
3.	MOOC- Fashion And Sustainability, Understanding Luxury Fashion in a Changing World	4 WEEKS	2.5
4.	How to Build a Sustainable Fashion Business	8 WEEKS	4
5.	Environmental Protection And Sustainability	8 WEEKS	4
6.	Digital Arts	8 WEEKS	4
7.	The Art Of Photography	4 WEEKS	2
8.	Portfolio and Risk Management	4 WEEKS	2
9.	Entrepreneurial Operation: Launching A Startup	4 WEEKS	2
10.	Swayam- Advertising	4 WEEKS	2
11.	Coursera- Graphic Design Specialization	4 WEEKS	2
12.	Photography	4 WEEKS	2
13.	Creative Entrepreneur	4 WEEKS	2
14.	Modern Arts And Ideas	5 WEEKS	2.25
15.	Art And Ideas Teaching With Themes	5 WEEKS	2.25
16.	Abstract Painting	8 WEEKS	4
17.	Fundamental And Graphic Design	4 WEEKS	2
18.	Creating a Portfolio	4 WEEKS	2
19.	Video Processing	12 WEEKS	6
20.	Science of Clothing Comfort	12 WEEKS	6
21.	Technical Textiles	12 WEEKS	6
22.	Innovation business models &entrepreneurship	8 WEEKS	4
23.	Research Methodology	8 WEEKS	4
24.	Entrepreneurship & IP strategy	8 WEEKS	4
25.	Introduction to retail management	6 WEEKS	2
26.	Sustainability science	12 WEEKS	6
27.	Computer aided design/Computer aided manufacturing	6 WEEKS	2
28.	Entrepreneurship: Do your venture	6 WEEKS	2
29.	Introduction to research	8 WEEKS	4

30.	Textile Finishing	12 WEEKS	6

BU MOOC COURSES

Course code		TECHNICAL TEXTILES AND ITS APPLICATIONS	L	T	P	C
BU MOOC			2	-	-	2
Pre-requisite		Basic knowledge in Textile science	Syllabus Version		2020-2021	

Course Objectives:

The main objectives of this course are to:

1. Learn about fibers and methods used for the production of Technical Textiles
2. Learn in detail about the classifications of Technical Textiles
3. Learn about the application of the Technical Textiles in various fields

Expected Course Outcomes:

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

1	Identify textile fibers used in technical textiles products	K1
2	Understand the various applications of Technical Textiles	K2
3	Apply their knowledge about contribution of technical textiles in various fields	K3
4	Analyse the different types of technical textiles products in the market.	K4
5	Design products for the application of technical textile products in the industry.	K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	Technical Textiles & Fibers	06 hours

Technical Textiles: Introduction, Meaning, Definition, Classification, Scope of Technical Textiles Applications of technical textiles.

Technical Fibers: Developments in natural fibers, High – Strength and high-modulus organic fibers, High chemical and combustion - resistant organic fibers, High performance inorganic fibers, Ultra-fine and novelty fibers.

Unit:2	Medical Textiles	06 hours

Medical Textiles: Introduction, Fibers used, Properties, Classification- Non – Implantable, Implantable, Extra corporal devices, Health care /Hygiene Products and Applications.

Unit:3	Agro Textiles	06 hours

Agro Textiles – **-** Introduction, fibers used Types, functions and properties, Characteristics and Applications in Agro products and in its field

Unit:4	Protective Textiles	06 hours

Protective Textiles: Introduction, fibers used Types, functions and properties, Characteristics and Applications in various Protective clothing.

Unit:5	Smart and Intelligent Textiles	06 hours

Smart and Intelligent Textiles – Classification - Active smart, passive smart and very smart textiles and - Phase change materials, shape memory polymers, chromic and conductive Materials and its applications in various Wearable technology.

Unit:6	**Contemporary Issues**	**02 hours**
Expert lectures, online seminars – webinars		
	Total Lecture hours	**30 hours**

Text Books	
1	Hand book of Technical textiles, A. R. Horrocks and S. C. Anand, Wood head publishing ltd, England,2000
2	Technical Textiles and its Application,Dr.S.Grace Annapoorani, LASER Park Publishing House, India ,2017
3	Textiles for Industrial Applications , R SenthilKumar, CRC Press,2013
Reference Books	
1	V. Textile Fibers: Developments and Innovations. Kothari, New Delhi: IAFL Publications, 2000.
2	Handbook of Industrial Textiles, Sabit Adanur, Wellington Sears CRC Press, 1995
3	Dr.S.Grace Annapoorani- Agro Textiles and its Application, Wood head publishing ltd, India, 2018
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	http://ugcmoocs.inflibnet.ac.in/ugcmoocs/view_module_ug.php/130
2	https://www.textile Learner blogspot.con
3	https://textilelearner.blogspot.com/2020/03/nfc-embedded-smart-textiles.html
4	https://www.technical-textiles.net
5	https://www.sciencedirect.com/topics/materials-science/smart-textiles

Course Designed By: Dr.S.Grace Annapoorani

Course code		ATTIRE DESIGNING	L	T	P	C
BU MOOC			2	0	0	2
Pre-requisite		Basic knowledge about designing	Syllabus Version	2020-2021		

Course Objectives:

1. Study about body measurements and its principles
2. To understand about pattern making methods
3. To acquire knowledge about Fitting
4. To be aware about lay out planning
5. To learn Fashion Designing

Expected Course Outcomes:

on the successful completion of the course, student will be able to:

1	Understand Body Measurements	K2
2	Understand different types of pattern making methods	K2
3	Analyze principles of fit and alterations	K4
4	Classify Layout types	K4
5	Apply color theory	K3

K1 – Remember; **K2** – Understand; **K3** – Apply; **K4** – Analyze; **K5** – Evaluate; **K6** – Create

Unit:1	Body Measurements	7 hours

Body measurements –Importance and principles of taking body measurements, standardizing the **Body measurements**, commercial patterns.

Unit:2	Pattern Making	6 hours

Pattern Making -Methods of Drafting, draping . flat pattern techniques and pattern grading

Unit:3	Fitting And Pattern Alteration	5 hours

Fitting and pattern alteration-good fit, principles of good fit, pattern alteration, general principles of pattern alterations

Unit:4	Lay Out Planning	5 hours

Lay out planning- definition, types of lay outs, economy of fabrics in placing patterns, adjusting fabric to patterns.

Unit:5	Fashion Designing	5 hours

Fashion Designing-Elements ,principles of design and colour

Unit:6	Contemporary Issues	02 hours

Expert lectures, online seminars – webinars

	Total Lecture hours	**30 hours**
Text Books		
1	Zarapkar System of cutting, Zarapkar Tailoring College, Navneet, 2010.	
2	Pattern Making for Fashion Design, ,Armstrong, H, Harpes and Row, 2009	
3	Metric Pattern Cutting for Menswear, Winifred Aldrich, Wiley-Blackwell; 5th Edition,2011	
4	Design Elements, Color Fundamentals: A Graphic Style Manual for Understanding How Color Affects Design, Aaris Sherin, Rockport , 2012.	
5	Fashion designing and technology, Anmol roy, Sonali Publications, 2011.	
Reference Books		
1	A Complete Guide to Fashion Designing, Jenny Davis, Abhishek Publications, Chandigarh, First Edition, 2006.	
2	Introduction to Fashion Technology, Pooja Khurana and Monika Sethi, Laxmi, 2007.	
3	Fashion design process innovation and practice, Kathryn Mc kelvey and Janine munslow, Wiley, 2012.	
4	Elements of Fashion and Apparel Design, Sumathi, G.J, New Age International ,2002.	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]		
1	https: https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=827 //www.slideshare.net/DharmendraKumar344/pattern-making-study-material	
2	httphttps://www.slideshare.net/sarwatshabbir/flat-pattern s://nptel.ac.in/content/storage2/courses/109104075/pdf_lectures/lecture3.pdf	
3	https:/ https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=827 /www.tigercolor.com/color-lab/color-theory/color-theory-intro.htm	
4	hhttps://www.universityoffashion.com/disciplines/draping/ ttps://www.my-mooc.com/en/mooc/design-principles-an-introduction/	
5	https://www.my-mooc.com/en/mooc/designing-and-creating-skirts/ration-a-multi-method-approach-to-	
Course Designed By: Dr.M.Sumithra		

Course code		SUSTAINABLE FASHION	L	T	P	C
BU MOOC			2	0	0	2
Pre-requisite		Basic knowledge about fashion and sustainability	Syllabus Version		2020-2021	

Course Objectives:

The main objectives of this course are to:

1. Learn about sustainability of Fashion industry.
2. Learn about ethical fashion.
3. Learn about Eco textiles and Eco friendly fashion labels.

Expected Course Outcomes:

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

1	Understand sustainability of fashion industry.	K2
2	Analyze ethical fashion.	K4
3	Analyze eco-textiles and eco-friendly fashion labels.	K4
4	Evaluate sustainable fashion products.	K5
5	Create upcycled / downcyled products.	K6

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Unit:1	Sustainability in Fashion	6 hours

Introduction: Fashion, Sustainability, Pillars of sustainability, Sustainable fashion – meaning and importance.

Unit:2	Fashion and Clothing	5 hours

Clothing lifecycle, clothing care, fast and slow fashion, clothes repair and re-use

Unit:3	Ethical Fashion	6 hours

Concepts of recycling and upcycling. Carbon footprint, water footprint and energy consumption of fashion industry.

Unit:4	Green Consumerism	5 hours

Eco-textiles, green consumerism and waste reduction, consumer responsibility towards sustainable fashion. 3Rs – Reduce, Reuse and Recycle.

Unit:5	Sustainable Fashion Brands and Labels	6 hours

Sustainable fashion designers, sustainable fashion brands, Eco-friendly fashion labels

Unit:6	Contemporary Issues	02 hours

Expert lectures, online seminars - webinars

Total Lecture hours	**30 hours**

Text Books	
1	Sustainable Fashion Handbook, Black, S, Thames and Hudson, 2013.
2	Re-Fashioned- Cutting Edge Clothing from Upcycled Materials, Brown S, Lawrence King Publishing, 2013.
3	Fashion and Sustainability-Design for Change, Fletcher K, Lawrence King Publishing, 2012.
Reference Books	
1	Cut up Couture- Edgy Upcycled Garments to Sew, Yamase K, Interweave, 2012.
2	Sustainable Fashion and Textiles- A Design Journey, Fletcher K, Lawrence King Publishing, 2008.
3	Sustainable Luxe- A Guide to Feel Good Fashion, Phillips J, Create Space Publishing, 2013.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]	
1	https://www.coursera.org/learn/sustainable-fashion
2	https://www.edx.org/course/circular-fashion-in-a-sustainable-clothingindustry
3	https://www.my-mooc.com/en/mooc/sustainable-fashion/
4	https://www.sustainablefashionmatterz.com/what-is-sustainable-fashion
Course Designed By: Dr.K.Amutha	