

SONA COLLEGE OF TECHNOLOGY, SALEM-5

(An Autonomous Institution)

B.Tech-Fashion Technology

CURRICULUM and SYLLABI

[For students admitted in 2021-2022]

B.E / B.Tech Regulation 2019

Approved by BOS and Academic Council meetings

Sona College of Technology, Salem

(An Autonomous Institution)

Courses of Study for B.E./B.Tech. Semester I under Regulations 2019 (CBCS)

Branch: Fashion Technology

S.No.	Course Code	Course Title	L	T	P	C	Category	Total Contact Hours
Theory								
1.	U19ENG101D	English for Engineers - I	2	0	0	2	HS	30
2.	U19MAT102C	Calculus and Statistics	3	1	0	4	BS	60
3.	U19PHY103D	Engineering Physics - I	3	0	0	3	BS	45
4.	U19CHE104F	Chemistry for Textile Technologists - I	3	0	0	3	BS	45
5.	U19FTY107	Textile Science: Fibres and Yarns	3	0	0	3	PC	45
Practical								
6.	U19PCL108B	Physics and Chemistry Laboratory	0	0	2	1	BS	30
7.	U19FTL116	Fibre and Yarn Analytical Laboratory	0	0	2	1	PC	30
8.	U19CFTL117	Computer basics for Fashion Technology Laboratory	0	0	2	1	PC	30
9.	U19GE101	Basic Aptitude - I	0	0	2	0	EEC	30
Total Credits						18		
Optional Language Elective*								
10.	U19OLE1101	French	0	0	2	1	HS	30
11.	U19OLE1102	German						30
12.	U19OLE1103	Japanese						30

*Students may opt for foreign languages viz., German/French/Japanese with additional one credit (Not accounted for CGPA calculation)

Approved By

Chairperson, Science and Humanities BoS	Chairperson, Fashion Technology BoS	Member Secretary, Academic Council	Chairperson, Academic Council & Principal
Dr. M. Renuga	Dr. D. Raja	Dr. R. Shivakumar	Dr. S. R. R. Senthil Kumar

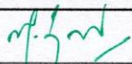
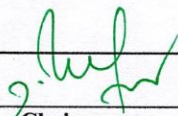
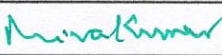
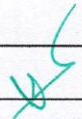
Copy to:-HOD/ Fashion Technology, First Semester BE FT Students and Staff, COE

Sona College of Technology, Salem – 636 005
(An Autonomous Institution)
Courses of Study for BE/B Tech Semester II under Regulations 2019 (CBCS)
Branch: Fashion Technology

S.No	Course Code	Course Title	L	T	P	C	Category	Total Contact Hours
Theory								
1	U19MAT202E	Probability and Statistical Quality Control	3	1	0	4	BSC	60
2	U19PHY203E	Engineering Physics - II	3	0	0	3	BSC	45
3	U19CHE204C	Chemistry for Textile Technologists - II	3	0	0	3	BSC	45
4	U19BEE206A	Basics of Mechanical and Electrical Engineering	3	0	0	3	ESC	45
5	U19FT201	Woven Fabric Manufacture and Structure	3	0	0	3	PCC	45
6	U19EGR206B	Engineering Graphics for Fashion Designing	1	0	2	2	ESC	45 (15L+30P)
Practical								
7	U19ENL215	English for Engineers - II	0	0	2	1	HSC	30
8	U19FT202	Woven Fabric Structure and Textile CAD Laboratory	0	0	2	1	PCC	30
9	U19GE201	Basic Aptitude – II	0	0	2	0	EEC	30
Total Credits						20		
Optional Language Elective*								
10	U19OLE1201	French	0	0	2	1	HSMC	30
11	U19OLE1202	German						
12	U19OLE1203	Japanese						

*Students may opt for foreign languages viz., German/French/Japanese with additional one credit (Not accounted for CGPA calculation)

Approved by

			
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Copy to:-HOD/ Fashion Technology, Second Semester BE FT Students and Staff, COE

Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester III under Regulations 2019
Branch: Fashion Technology

S. No	Course Code	Course Title	Lecture	Tutorial	Practical	Credit	Total Contact Hours
Theory							
1	U19MAT301E	Operations Research and Statistical Methods	3	1	0	4	60
2	U19FT301	Knitted Fabric Manufacture and Structure (lab integrated)	3	0	2	4	75
3	U19FT302	Chemical Processing of Textiles and Garments (Lab Integrated)	3	0	2	4	75
4	U19FT303	Fashion Art and Design	3	0	0	3	45
5	U19FT304	Pattern Making and Garment Construction - I	3	0	0	3	45
6	U19GE304	Mandatory Course : Constitution of India	2	0	0	0	30
Practical							
7	U19FT305	Pattern Making and Garment Construction Laboratory - I	0	0	2	1	30
8	U19FT306	Digital Fashion Design Laboratory	0	0	4	2	60
9	U19ENG301	Communication Skills Laboratory	0	0	2	1	30
10	U19GE301	Soft Skills and Aptitude – I	0	0	2	1	30
Total Credits						23	

Approved By

Chairman, Fashion Technology BoS

Dr.D.Raja

Member Secretary, Academic Council

Dr.R.Shivakumar

Chairperson, Academic Council & Principal

Dr.S.R.R.Senthil Kumar

Copy to:-

HOD/Fashion Technology, Third Semester B.Tech FT Students and Staff, COE

Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester IV Regulations 2019
Branch: Fashion Technology

S. No	Course Code	Course Title	Lecture	Tutorial	Practical	Credit	Total Contact Hours
Theory							
1	U19GE402	Mandatory Course: Environment and Climate Science	2	0	0	0	30
2	U19FT401	Pattern Making and Garment Construction - II	3	0	0	3	45
3	U19FT402	Garment Production Machinery and Equipment (Lab Integrated)	3	0	2	4	75
4	U19FT403	Problem Solving using Python Programming (Lab Integrated)	3	0	2	4	75
5	U19FT404	Textile and Apparel Quality Evaluation	3	0	0	3	45
6	U19FT405	Textile Materials for Fashion Design	3	0	0	3	45
Practical							
7	U19FT406	Pattern Making and Garment Construction Laboratory – II	0	0	2	1	30
8	U19FT407	Textile and Apparel Quality Evaluation laboratory	0	0	2	1	30
9	U19GE401	Soft Skills and Aptitude – II	0	0	2	1	30
10	U19FT408	Mini Project - I	0	0	2	1	30
11	U19FT409	In-Plant Training	2 Weeks			1	2 Weeks
Total Credits						22	

Approved By

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Dr.D.Raja

Member Secretary, Academic Council
Dr.R.Shivakumar

Chairperson, Academic Council & Principal
Dr.S.R.R.Senthil Kumar

Copy to:-

HOD/Fashion Technology, Fourth Semester B.Tech FT Students and Staff, COE


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Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester V under Regulations 2019
Branch: Fashion Technology

S. No	Course Code	Course Title	Lecture	Tutorial	Practical	Credit	Total Contact Hours
Theory							
1	U19FT501	Apparel Manufacturing	3	0	0	3	45
2	U19FT502	Apparel Production Planning and Control	3	0	0	3	45
3	U19FT503	Apparel Merchandising (Lab Integrated)	3	0	2	4	75
4	U19FT504	Functional Garments	3	0	0	3	45
5	U19FT904	Professional Elective - Principles of Management	3	0	0	3	45
6	noc23_mg110	NPTEL – Product and Brand Management	3	0	0	3	12 weeks
Practical							
7	U19FT505	Apparel Manufacturing Laboratory	0	0	2	1	30
8	U19FT506	Digital Pattern Development and Marker Planning Laboratory	0	0	2	1	30
9	U19GE501	Soft Skills and Aptitude – III	0	0	2	1	30
10	U19FT507	Mini Project - II	0	0	2	1	30
11	U19FT508	In-Plant Training	2 weeks			1	2 Weeks
Total Credits						24	

Approved By


Chairperson, Fashion Technology BoS
Dr.D.Raja


Member Secretary, Academic Council
Dr.R.Shivakumar


Chairperson, Academic Council & Principal
Dr.S.R.R.Senthil Kumar

Copy to:-

HOD/Fashion Technology, Fifth Semester B.Tech FT Students and Staff, COE

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Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester VI Regulations 2019
Branch: Fashion Technology

S. No	Course Code	Course Title	Lecture	Tutorial	Practical	Credit	Total Contact Hours
Theory							
1	U19FT601	Clothing Size, Fit and Comfort	3	0	0	3	45
2	U19FT602	Fashion Visual Merchandising	3	0	0	3	45
3	U19FT603	Industrial Engineering in Garment Production	3	0	0	3	45
4	U19FT911	Professional Elective - Fashion Forecasting	3	0	0	3	45
	U19FT912	Professional Elective - Value Engineering in the Apparel Industry					
5	U19FT917	Professional Elective - Advances in Garment Production	3	0	0	3	45
	U19FT919	Professional Elective - Fashion Retail Store Operations					
6	U19BM1001	Open Elective - Hospital Management	3	0	0	3	45
	U19CE1002	Open Elective - Municipal Solid Waste Management					
	U19CE1003	Open Elective - Energy Efficiency and Green Building					
	U19CS1001	Open Elective - Big Data Analytics					
	U19CS1003	Open Elective - Internet of Things					
	U19EC1006	Open Elective - Mobile Technology and its Applications					
	U19EE1002	Open Elective - Energy Conservation and Management					
	U19EE1003	Open Elective - Innovation, IPR and Entrepreneurship Development					
	U19EE1004	Open Elective - Renewable Energy Systems					
	U19ME1002	Open Elective - Industrial Safety					
U19ME1004	Open Elective - Renewable Energy Sources						

Practical							
7	U19FT604 ✓	3D Virtual Fit analysis Laboratory	0	0	2	1	30 ✓
8	U19FT605 ✓	Industrial Engineering in Garment Production Laboratory	0	0	2	1	30 ✓
9	U19GE601 ✓	Soft Skills and Aptitude – IV	0	0	2	1	30 ✓
10	U19FT606 ✓	Mini Project - III	0	0	2	1	30 ✓
Total Credits						22 ✓	

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Approved By

[Signature]
 Chairperson, Fashion Technology BoS
 Dr.D.Raja

[Signature]
 Member Secretary, Academic Council
 Dr.R.Shivakumar

[Signature]
 Chairperson, Academic Council & Principal
 Dr.S.R.R.Senthil Kumar

Copy to:-

HOD/Fashion Technology, Sixth Semester B.Tech FT Students and Staff, COE

Sona College of Technology, Salem-5**List of Professional Electives B.E/B.Tech under Regulation 2019****Department: - Fashion Technology**

S.No	Course Code	Course Name	L	T	P	C
1.	U19FT901	Fashion Evolution and Traditional Indian Textiles	3	0	0	3
2.	U19FT902	Apparel Work Study	3	0	0	3
3.	U19FT903	Total Quality Management in Apparel Industry	3	0	0	3
4.	U19FT904	Principles of Management	3	0	0	3
5.	U19FT905	Digitalization in Fashion Industry	3	0	0	3
6.	U19FT906	Intimate Apparel	3	0	0	3
7.	U19FT907	ERP and MIS in Apparel Industry	3	0	0	3
8.	U19FT908	Sourcing and Sampling	3	0	0	3
9.	U19FT909	Fashion Advertising and Sales Promotion	3	0	0	3
10.	U19FT910	Home Textiles	3	0	0	3
11.	U19FT911	Fashion Forecasting	3	0	0	3
12.	U19FT912	Value Engineering in the Apparel Industry	3	0	0	3
13.	U19FT913	Apparel Logistics and Supply Chain Management	3	0	0	3
14.	U19FT914	Fashion Brand Management	3	0	0	3
15.	U19FT915	Wearable Technology	3	0	0	3
16.	U19FT916	Design of Leather Wear and Accessories	3	0	0	3
17.	U19FT917	Advances in Garment Production	3	0	0	3
18.	U19FT918	Apparel and Fashion Marketing	3	0	0	3
19.	U19FT919	Fashion Retail Store Operations	3	0	0	3
20.	U19FT920	Sustainability in Apparel Industry	3	0	0	3
21.	U19FT921	Fashion Photography	3	0	0	3
22.	U19FT922	Lean Manufacturing in Apparel Industry	3	0	0	3
23.	U19FT923	Global Trade and export documentation	3	0	0	3
24.	U19FT924	Luxury Brand Management	3	0	0	3
25.	U19FT925	Leather Technology	3	0	0	3
26.	U19FT926	Fashion styling	3	0	0	3
27.	U19FT927	Entrepreneurship Development and Management of Apparel Industry	3	0	0	3
28.	U19FT928	Social Compliance in Apparel Industry	3	0	0	3
29.	U19FT929	Digital Fashion Marketing	3	0	0	3
30.	U19FT930	Industrial Safety and Human Resource Management	3	0	0	3

SONA COLLEGE OF TECHNOLOGY, SALEM-5

DEPARTMENT OF FASHION TECHNOLOGY

LIST OF PROFESSIONAL ELECTIVES FOR HONORS DEGREE

Date: 11.05.2023

S.No	Vertical 1: Fashion Design and Product Development	Vertical 2: Advanced Apparel Manufacturing	Vertical 3: Fashion Brands and Retail Management	Vertical 4: Apparel Merchandising and Marketing	Vertical 5: Functional Garments
1.	High Fashion Designing	Production Improvement Techniques and Low Cost Automation	Fashion Brand Management	Sourcing and Vendor Management	Textile Materials for Functional Garments
2.	Boutique Management	Lean Manufacturing in Apparel Industry	Fashion Retail Store Operations	Apparel Logistics and Supply Chain Management	Design and Engineering of Functional Garments
3.	Jewellery Design	Value Engineering in the Apparel Industry	E-Commerce in Fashion	Apparel and Fashion Marketing	Protective Clothing
4.	Sustainable Fashion Designing	Knitwear Manufacturing Technology	Fashion Retail Management	Apparel Sampling Process	Sports Clothing
5.	Fashion Styling	ERP and MIS in Apparel Industry	Pricing and Finance Management	Total Quality Management in Apparel Industry	Medical Textiles
6.	Knitwear Design and Product Development	Sustainable Manufacturing	International Business Management	Global Trade and Export Documentation	E- Textiles
7.	Leatherwear and Accessories	Automation and Robotics in Apparel Industry	Supply Chain Management	Social Compliance in Apparel Industry	Basics of Wearable Electronics
8.	Project Work - Fashion Design	Project Work - Advanced Apparel Manufacturing	Project Work - Fashion Brands and Retail Management	Project Work - Apparel Merchandising and Marketing	Project Work - Functional Garments

SONA COLLEGE OF TECHNOLOGY, SALEM-5
DEPARTMENT OF FASHION TECHNOLOGY
Honours Degree- Verticals & Courses

(Offered to UG students admitted during AY 2021- 2022 onwards, Regulation 2019)

Vertical 1. Fashion Design

S.No	Course code	Course Name	L	T	P	C
1	U19FT2001	High Fashion Designing	2	0	2	3
2	U19FT2002	Boutique Management	3	0	0	3
3	U19FT2003	Jewellery Design	2	0	2	3
4	U19FT2004	Sustainable Fashion Designing	3	0	0	3
5	U19FT926	Fashion Styling	3	0	0	3
6	U19FT2005	Knitwear Design and Product Development	2	0	2	3
7	U19FT2006	Leatherwear and Accessories	2	0	2	3
8	U19FT2007	Project Work - Fashion Design	0	0	6	3
Maximum of two SWAYAM courses in Fashion Design vertical identified by Department consultative committee						

Vertical 2 - Advanced Apparel Manufacturing

S.No	Course code	Course Name	L	T	P	C
1	U19FT2008	Production Improvement Techniques and Low Cost Automation	3	0	0	3
2	U19FT922	Lean Manufacturing in Apparel Industry	3	0	0	3
3	U19FT912	Value Engineering in the Apparel Industry	3	0	0	3
4	U19FT2009	Knitwear Manufacturing Technology	3	0	0	3
5	U19FT907	ERP and MIS in Apparel Industry	3	0	0	3
6	U19FT2010	Sustainable Manufacturing	3	0	0	3
7	U19FT2011	Automation and Robotics in Apparel Industry	3	0	0	3
8	U19FT2012	Project Work - Advanced Apparel Manufacturing	0	0	6	3
Maximum of two SWAYAM courses in Advanced Apparel Manufacturing vertical identified by Department consultative committee						

Vertical 3: Fashion Brands and Retail Management

S.No	Course code	Course Name	L	T	P	C
1	U19FT914	Fashion Brand Management	3	0	0	3
2	U19FT919	Fashion Retail Store Operations	3	0	0	3
3	U19FT2013	E-Commerce in Fashion	3	0	0	3
4	U19FT2014	Fashion Retail Management	3	0	0	3
5	U19FT2015	Pricing and Finance Management	3	0	0	3
6	U19FT2016	International Business Management	3	0	0	3
7	U19FT2017	Supply Chain Management	3	0	0	3
8	U19FT2018	Project Work - Fashion Brands and Retail Management	0	0	6	3
Maximum of two SWAYAM courses in Fashion Brands and Retail Management vertical identified by Department consultative committee						

Vertical 4: Apparel Merchandising and Marketing

S.No	Course code	Course Name	L	T	P	C
1	U19FT2019	Sourcing and Vendor Management	3	0	0	3
2	U19FT913	Apparel Logistics and Supply Chain Management	3	0	0	3
3	U19FT918	Apparel and Fashion Marketing	3	0	0	3
4	U19FT2020	Apparel Sampling Process	3	0	0	3
5	U19FT903	Total Quality Management in Apparel Industry	3	0	0	3
6	U19FT923	Global Trade and Export Documentation	3	0	0	3
7	U19FT928	Social Compliance in Apparel Industry	3	0	0	3
8	U19FT2021	Project Work - Apparel Merchandising and Marketing	0	0	6	3
Maximum of two SWAYAM courses in Apparel Merchandising and Marketing vertical identified by Department consultative committee						

Vertical 5: Functional Garments

S.No	Course code	Course Name	L	T	P	C
1	U19FT2022	Textile Materials for Functional Garments	3	0	0	3
2	U19FT2023	Design and Engineering of Functional Garments	3	0	0	3
3	U19FT2024	Protective Clothing	3	0	0	3
4	U19FT2025	Sports Clothing	3	0	0	3
5	U19FT2026	Medical Textiles	3	0	0	3
6	U19FT2027	E- Textiles	3	0	0	3
7	U19FT2028	Basics of Wearable Electronics	3	0	0	3
8	U19FT2029	Project Work - Functional Garments	0	0	6	3
Maximum of two SWAYAM courses in Functional Garments vertical identified by Department consultative committee						

SONA COLLEGE OF TECHNOLOGY, SALEM-5

DEPARTMENT OF FASHION TECHNOLOGY

Minor Degree- Verticals & Courses

(Offered to UG students admitted during AY 2021- 2022 onwards, Regulation 2019)

Minor Vertical 1. Fashion Design						
S.No	Course code	Course Name	L	T	P	C
1	U19FT1001	Fundamentals of Fashion Design	3	0	0	3
2	U19FT2030	Fashion Illustration	1	0	4	3
3	U19FT2031	Surface Ornamentation	2	0	2	3
4	U19FT2032	Fashion Accessories	2	0	2	3
5	U19FT2033	CAD in Fashion	1	0	4	3
6	U19FT921	Fashion Photography	3	0	0	3
7	U19FT2034	Jewellery Making	3	0	0	3
8	U19FT2035	Fashion Portfolio and Product Development	1	0	4	3
Maximum of two SWAYAM courses in Fashion Design vertical identified by Department consultative committee						

Minor Vertical 2. Apparel Industrial Automation						
S.No	Course code	Course Name	L	T	P	C
1	U19FT1002	Garment Manufacturing Technology	3	0	0	3
2	U19FT2036	Basics of Garment Production Machinery and Equipment	3	0	0	3
3	U19FT2037	Advanced Manufacturing Technology	3	0	0	3
4	U19FT2038	Computer Integrated Manufacturing	3	0	0	3
5	U19FT2039	Basics of Smart Textiles and Garments	3	0	0	3
6	U19FT2040	Design and Development of Smart Garments	3	0	0	3
7	U19FT2041	Apparel Production System	3	0	0	3
8	U19FT2042	Project Work - Apparel Industrial Automation	1	0	4	3
Maximum of two SWAYAM courses in Apparel Industrial Automation vertical identified by Department consultative committee						

Sona College of Technology, Salem

(An Autonomous Institution)

Courses of Study for B.E./B.Tech. Semester I under Regulations 2019 (CBCS)

Branch: Fashion Technology

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Theory								
1.	U19ENG101D	English for Engineers - I	2	0	0	2	HS	30
2.	U19MAT102C	Calculus and Statistics	3	1	0	4	BS	60
3.	U19PHY103D	Engineering Physics - I	3	0	0	3	BS	45
4.	U19CHE104F	Chemistry for Textile Technologists - I	3	0	0	3	BS	45
5.	U19FTY107	Textile Science: Fibres and Yarns	3	0	0	3	PC	45
Practical								
6.	U19PCL108B	Physics and Chemistry Laboratory	0	0	2	1	BS	30
7.	U19FTL116	Fibre and Yarn Analytical Laboratory	0	0	2	1	PC	30
8.	U19CFTL117	Computer basics for Fashion Technology Laboratory	0	0	2	1	PC	30
9.	U19GE101	Basic Aptitude - I	0	0	2	0	EEC	30
Total Credits						18		
Optional Language Elective*								
10.	U19OLE1101	French	0	0	2	1	HS	30
11.	U19OLE1102	German						30
12.	U19OLE1103	Japanese						30

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U19ENG101D - ENGLISH FOR ENGINEERS – I

Common to FT

L T P C

2 0 0 2

Course Outcome: At the end of course, the students will be able to

1. Frame sentences correctly with accuracy.
2. Write emails and formal letters
3. Prepare reports and proposals
4. Draft memos for professional purposes
5. Recommend suggestions / solutions to problems, give instruction, make notes, prepare checklists

	Course Outcomes	Programme Outcomes												Pso1	Pso2
		1	2	3	4	5	6	7	8	9	10	11	12		
1	Frame sentences correctly with accuracy	2	1	1	1	1	2	3	2	2	3	3	3	3	3
2	Write emails and formal letters	3	2	2	3	3	3	3	2	3	3	3	3	3	3
3	Prepare reports and proposals	3	3	2	3	3	3	3	2	3	3	3	3	3	3
4	Draft memos for professional purposes	1	1	1	2	2	1	2	2	1	3	1	1	1	1
5	Recommend suggestions / solutions to problems, give instruction, make notes, prepare checklists	2	1	1	3	2	2	3	3	3	3	2	3	3	3

UNIT – I

- General Vocabulary- Parts of speech, Prefixes and Suffixes, Active and Passive voices
- Email - fixing an appointment, Cancelling appointments, conference details, hotel accommodation, order for equipment, training programme details, paper submission for seminars and conferences

UNIT – II

- Adjectives, comparative adjectives, Prepositions and dependent prepositions
- Letter Writing - Business communication, quotations, placing orders, complaints, replies to queries from business customers, inviting dignitaries, accepting and declining invitations
- Resume / CV

UNIT – III

- Tenses, Modal verbs and probability
- Proposal: establishing a lab, introducing a subject in the curriculum, training programme for students

UNIT – IV

- Concord, If conditionals, Collocations
- Technical report writing - feasibility reports, accident reports, survey reports

UNIT - V

- Cause and effect expressions, Pronouns, Adverbs
- Technical Writing: recommendations, checklists, instructions, note making and memo

TOTAL: 30 hours

TEXT BOOK

- Technical English I & II, Dr. M. Renuga et al. Sonaversity, 2016

U19MAT102C - CALCULUS AND STATISTICS

L T P C
3 1 0 4

Course Outcomes: At the end of the course, the students will be able to

COURSE OUTCOMES

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

1. apply the various differentiation techniques to the algebraic and transcendental functions
2. apply the various integration techniques to the algebraic and transcendental functions
3. represent the data in the form of diagram and graph and analyze them
4. apply the concepts of measure of central tendency, dispersion and skewness to the given data and analyze the results
5. apply the concepts of correlation and regression to the data and analyze the result.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3		3								2			3
CO2	3	3		3								2			3
CO3	3	3		3								2			3
CO4	3	3		3								2			3
CO5	3	3		3								2			3

UNIT – I DIFFERENTIAL CALCULUS

12

Ordinary Differentiation: Rules of differentiation – Derivatives of elementary functions – Differentiation of inverse functions – Logarithmic differentiation – Differentiation of implicit functions – Successive differentiation of simple functions.

Partial Differentiation: Total derivative – Euler’s theorem – Differentiation of implicit functions.

UNIT – II INTEGRAL CALCULUS

12

Definite and indefinite integrals – Substitution rule – Integration by parts – Bernoulli’s formula – Integration of rational functions by partial fraction – Double integral in Cartesian coordinates – Change of order of integration.

UNIT – III COLLECTION AND REPRESENTATION OF DATA

12

Collection of data – Primary and secondary data – Diagrammatic representation – Simple, subdivided and multiple bar diagrams – Pie diagram – Pictograph – Graphs of frequency distribution – Histogram – Frequency polygon – Frequency curve – Cumulative frequency curve.

UNIT – IV MEASURES OF CENTRAL TENDENCY, DISPERSION AND SKEWNESS 12

Measure of central tendency (Simple arithmetic mean, median, mode) – Quartile's – Measure of dispersion (range, inter-quartile range, quartile deviation, mean deviation, standard deviation, coefficient of variation) – Skewness – Karl Pearson's coefficient of skewness.

UNIT – V CORRELATION AND REGRESSION 12

Simple and rank correlations – Multiple and partial correlations – Linear regression – Multiple and partial regressions – Curve fitting (straight line and parabola).

Theory: **45 Hours**

Tutorial: **15 Hours**

Total: **60 Hours**

TEXT BOOKS:

1. S. Narayanan and T. K. Manicavachagom Pillay, "Calculus – volume I and II", S. Viswanathan Publishers, 2016.
2. S. P. Gupta, "Statistical Methods", Sultan Chand and Sons Publishers, 15th Edition, 2012.

REFERENCE BOOKS:

1. J. Stewart, "Calculus", Cengage Publishers, 8th Edition, 2016.
2. G. B. Thomas, "Calculus", Pearson Publishers, 14th Edition, 2018.
3. S. C. Gupta and V. K. Kapoor, "Fundamentals of Mathematical Statistics", Sultan Chand and Sons Publishers, 11th Edition, Reprint, 2019.
4. R. A. Johnson and C. B. Gupta, "Miller and Freund's, Probability and Statistics for Engineers", Pearson Publishers, 9th Edition, 2018.
5. P. G. Hoel, S. C. Port and C. J. Stone, "Introduction to Probability Theory", Universal Book Stall Publishers, Reprint, 2003.

U19PHY103D - ENGINEERING PHYSICS -I

(For B.Tech. Fashion Technology)

L T P C
3 0 0 3

Course Outcomes: At the end of the course, the students will be able to,

CO1: Discuss the dual nature of matter and radiation and the application of wave nature of particles.

CO2: Describe the basic components of lasers.

CO3: Analyse the relation between arrangement of atoms and material properties.

CO4: Deduce Maxwell's equations using the fundamentals of electromagnetism.

CO5: Elucidate the different modes of heat transfer.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
COs, POs PSOs Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO-1	3	2	-	-	-	-	-	-	-	-	2	2	-	3
CO-2	3	2	-	-	-	-	-	-	-	-	2	2	-	3
CO-3	3	2	-	-	-	-	-	-	-	-	2	2	-	3
CO-4	3	2	-	-	-	-	-	-	-	-	2	2	-	3
CO-5	3	2	-	-	-	-	-	-	-	-	2	2	-	3

UNIT I - QUANTUM PHYSICS

9

Origin of quantum mechanics – Limitations of classical theory - Dual nature of matter and radiation.

Particle nature of radiation - Compton effect - Explanation based on quantum theory - Expression for Compton shift (no derivation).

Wave nature of matter - de Broglie waves - Schrödinger's time independent and time dependent wave equations - Physical significance of wave function - Energy and wave function of an electron trapped in one dimensional box.

Application of wave nature of particles - Electron microscope - Comparison of optical and electron microscope - Scanning electron microscope - Limitations of electron microscope.

UNIT II - LASERS

9

Basic terms - Energy level - normal population - Stimulated absorption - population inversion - meta stable state - spontaneous emission - stimulated emission.

Basic components of a laser - Active medium - pumping technique - optical resonator
Einstein's theory - stimulated absorption - spontaneous emission and stimulated emission.

Types of lasers - Solid lasers (Nd:YAG) - Gas lasers (CO₂ laser) - semiconductor laser (homojunction and hetero junction laser).

Holography - Construction and reconstruction of hologram.

UNIT III - CRYSTAL PHYSICS

9

Importance of crystals - Types of crystals - Basic definitions in crystallography (Lattice –space lattice - unit cell - lattice parameters – basis - crystallographic formula) - Seven crystal systems and fourteen Bravais lattices – Lattice planes and Miller indices – Interplanar distance - d spacing in cubic lattice - Calculation of number of atoms per unit cell - Atomic radius - Coordination number and Atomic Packing factor for SC, BCC, FCC and HCP Structures - Polymorphism and allotropy.

Crystal imperfections - Point, line and surface defects - Burger vector.

UNIT IV - ELECTROMAGNETISM

9

Electrostatics - Electric field - Electric field intensity – Field due to discrete and continuous

charges – Electric lines of forces – Electric flux – Gauss’s law – Divergence of E – Applications of Gauss’s law – Curl of E.

Magnetostatics – Magnetic fields – Magnetic Lorentz force – Force experienced by current carrying conductor in magnetic field – Steady currents – Magnetic field due to steady current - Biot - Savart Law - Straight line currents – Ampere’s circuital law – Divergence and curl of B – Applications of Ampere’s circuital law - Comparison of Magnetostatics and Electrostatics.

UNIT V - THERMAL PHYSICS

9

Heat and temperature - Modes of heat transfer (Conduction, convection and radiation) - Specific heat capacity - thermal capacity and coefficient of linear thermal expansion.

Thermal conductivity - Measurement of thermal conductivity of good conductor - Forbe’s method - Measurement of thermal conductivity of bad conductor - Lee’s disc method - Radial flow of heat - Cylindrical flow of heat - Practical applications of conduction of heat.

Thermal radiations - Properties of thermal radiations - Applications of thermal radiations.

Total: 45 Hours

TEXT BOOKS

1. M.N.Avadhanulu, 'Engineering Physics' S.Chand & Company Ltd, New Delhi (2015)
2. D. K. Bhattacharya, Poonam Tandon "Engineering Physics" Oxford University Press 2017.

REFERENCES

1. Engineering Physics, Sonaversity, Sona College of Technology, Salem (Revised Edition 2018).
2. B. K. Pandey and S. Chaturvedi, Engineering Physics , Cengage Learning India Pvt. Ltd., Delhi, 2019
3. Rajendran, V, and Marikani A, 'Materials science' TMH Publications, (2004) New Delhi.
4. Palanisamy P.K, 'Materials science', SciTech Publications (India) Pvt. Ltd., Chennai, Second Edition (2007)

U19CHE104F - CHEMISTRY FOR TEXTILE TECHNOLOGISTS – I

L T P C
3 0 0 3

Course Outcomes: At the end of the course, the students will be able to,

- CO1:** Analyze the types of impurities of water, their removal methods and explain the conditioning methods for domestic and industrial uses.
- CO2:** Analyze the various types of chemical bonding and impacts on materials.
- CO3:** Recognize the role applications of surface chemistry and catalysis in engineering and technology.
- CO4:** Understand the basics of nano chemistry and nano material fabrication on fibers and its role.
- CO5:** Apply the various instrumental methods of analysis on numerous engineering materials and their significances.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
COs, POs PSOs Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO - 1	3	3												2
CO - 2	3	3												2
CO - 3	3	3												2
CO - 4	3	3												3
CO - 5	3	3												2

UNIT I - WATER TECHNOLOGY

09

Introduction - Characteristics – hardness – estimation of hardness by EDTA method, alkalinity and its estimation - Boiler feed water – requirements – disadvantages of using hard water in boilers – internal conditioning (colloidal, phosphate, calgon and carbonate conditioning methods) – external conditioning – zeolite process, demineralization process, desalination of brackish water by reverse osmosis.

UNIT II - CHEMICAL BONDING

09

Types of bond – van der Waals (or) intermolecular forces – types – hydrogen bond – types, Valence Bond Theory (VBT) – VSEPR Theory - Molecular Orbital Theory – Linear Combination of Atomic Orbitals (LCAO method)- energy level diagram of molecular orbitals (nitrogen and oxygen only) – coordinate bond – metallic bond.

UNIT III - SURFACE CHEMISTRY AND CATALYSIS

09

Adsorption-types-physical and chemical adsorption – adsorption of gases on solids-adsorption isotherms-Freundlich and Langmuir isotherms-adsorption of solutes from solution – applications of adsorption - role of adsorption in catalytic reactions – basic

principles in adsorption chromatography – adsorption in pollution abatement (granular activated carbon and powdered activated carbon) – catalysis - types - characteristics of catalysts - autocatalysis - definition and examples.

UNIT IV - APPLICATIONS OF NANO CHEMISTRY IN TEXTILES 09

Basics - distinction between molecules, nanoparticles and bulk materials – size dependent properties – Synthesis: precipitation – thermolysis – hydrothermolysis – solvothermolysis –sol-gel technique – Potential applications of Nanoparticles in textiles - Fabrication Process – Electrospinning- Self Cleaning Fabrics - Water Repellency Property- UV-Protection Property - Anti-Bacterial Property - Anti-Static Property - Wrinkle Resistance Property - Flame Retardant Finish- Nanotextiles – Properties, Types, Functionalities and Processes.

UNIT V - INSTRUMENTAL METHODS OF ANALYSIS 09

Beer-Lambert's law – UV-Visible spectroscopy, Colourimetry – principles and instrumentation - Estimation of Iron - IR and FT-IR spectroscopy – principles and instrumentation (block diagram only) - Thermoanalytical methods – principles and applications of Thermogravimetry (TGA), Differential thermal analysis (DTA) and Differential Scanning Calorimetry (DSC).

Total: 45 Hours

TEXT BOOKS

- P.C.Jain and Monica Jain, “Engineering Chemistry” Dhanpat Rai Pub, Co., New Delhi, 2018 (17th Edition).
- N. Panneer Selvam et al., “Chemistry For Textile Technologists - I”, Sonaversity, Sona College of Technology, Salem, 2019.

REFERENCE BOOKS

- O.G. Palanna “Engineering Chemistry” Tata McGraw-Hill Pub.Co.Ltd, New Delhi, 2017.
- Kannan P., Ravikrishnan A., “Engineering Chemistry”, Sri Krishna Hi-tech Publishing Company Pvt. Ltd., Chennai, 2016.
- H.K. Chopra, A. Parmer, “Chemistry for Engineers”, Narosa Publishing House, New Delhi, 110 002, 2016.

U19FTY107 - TEXTILE SCIENCE: FIBRES AND YARNS

L T P C
3 0 0 3

Course Outcomes: At the end of the course, the students should be able to,

- Classify textile fibres, define the basic terms used, outline fundamental concepts of fibre structure, describe the properties of an ideal fibre and state the properties and uses of major natural fibres.
- Describe the common man-made fibre spinning techniques and explain the properties and uses of major natural-polymer, synthetic and special fibres.
- Describe the identification methods of common fibres and define the common linear density terms used for man-made fibres.
- Outline the objectives and working principles of the different processes in spun yarn production.
- Describe sewing thread types, fibres used, quality requirements, outline of production and state the characteristics and uses of fancy yarns and certain special yarns.

CO/PO, PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	3		3	1					3	1	2	2
CO2	3	3	2	2	2	2	2					3	3	2	2
CO3	3	2	2	2	2	1						3	2	1	2
CO4	3	3	3	3	2	3	3	3				3	3	2	2
CO5	2	3	2	2	2	2	2	3				3	2	2	2

UNIT I - GENERAL INTRODUCTION AND NATURAL FIBRES

10

Definitions: Textile fibre, staple fibre, filament; yarn: spun, continuous filament, monofilament and multifilament, flat and textured yarn; single, ply and cabled yarns; thread; fabric: woven, knitted and non-woven

Classification of textile fibres: Main classes and sub-classes with examples for each class / sub-class

Basic concepts of fibre structure: Definition of orientation, types, schematic representations and examples; definition of crystallinity, schematic representation of fibre with crystalline and amorphous contents, outline of influence of crystallinity on fibre properties; crystallinity values of some common natural and man-made fibres

Properties expected of a Textile Fibre: Definitions of fibre length, fineness, strength, flexibility, elongation, elasticity, moisture content, moisture regain, crimp, fibre uniformity, lustre, fibre modulus, T_m and T_g.; Essential and desirable properties of a textile fibre

Natural Fibres: Definition and source, properties and uses of cotton, flax, silk and wool

UNIT II - MAN MADE FIBRES

09

Introduction to man-made fibre spinning: Principles of wet-spinning, dry-spinning and melt-spinning of man-made fibres, principle of drawing and its importance.

Raw materials, properties and uses of natural-polymer and synthetic fibres: Viscose rayon, modal, bamboo, polyester, nylon 6, acrylic and elastomeric fibre. **High performance fibres:** Definition, characteristics, types, properties and uses of Nomex and Kevlar. Climate yarn; latest developments in fibres to attain comfort properties.

UNIT III - LINEAR DENSITY AND IDENTIFICATION OF FIBRES

08

Linear density: Definition, denier and tex systems, decitex, millitex, kilotex and English cotton count; Conversion formulae and simple calculations of linear density

Definition, properties and uses: Micro, nano fibres and bio polymers

Identification of common textile fibres: Microscopic test, burning test, solubility test and density test

UNIT IV - OUTLINE OF YARN PRODUCTION

10

Preparatory processes: Objects of ginning, names of machines used; Objects of mixing and blending; Objects of blow room, common sequence of machines used for processing of cotton, manmade fibre and blends; Objects of carding, outline of working principle of high production card; Objects of combing, difference between carded and combed yarns; Objects of draw frame, outline of working principle of draw frame; Objects of speed frame, outline of working principle of simplex

Yarn production: Objects of ring spinning outline of working principle of ring frame; yarn count and TPI; Objects of doubling, difference between single and double yarn; Outline of principles of compact spinning. **New spinning system:** Types and its needs, principle of rotor and air jet spinning system.

UNIT V - SEWING THREADS, FANCY YARNS AND SPECIAL YARNS

08

Sewing thread: Definition, quality requirements, fibres used, types, properties, production process, selection of sewing thread, ticket number, leading brands of sewing threads

Fancy yarns: Definition, brief study of slub yarn, snarl yarn, melange yarn, and spotted yarn. End uses of fancy yarn

Other special yarns: Brief study of core spun yarn, metallic yarn, hollow yarn and applications of these yarns

TOTAL: 45 Hours

TEXT BOOKS

1. Mishra S.P., “Fibre Science and Technology”, New Age International Publishers, New Delhi, 2000
2. Lord P. R., “Yarn Production: Science Technology and Economics”, The Textile Institute, Manchester, U.K., 2003

REFERENCES

1. Bernard P. Corbman, “Textiles: Fibre to Fabric”, McGraw Hill International Edition, New Delhi, 1983
2. Srinivasamoorthy H. V., “Introduction to Textile Fibres”, The Textile Association India, Mumbai, 1993
3. Cook, J. Gordon, “Hand Book of Textile Fibres: Man-Made Fibres”, Vol. 1 and 2, Merrow Publishing Co. Ltd., England, 2005
4. Moncrief R.W., “Manmade Fibres”, John Willey & Sons, New York, 2004
5. Klein W. “ A practical guide to opening and carding”, Vol 2, The Textile Institute, Manchester, 1987
6. Klein W. “ A practical guide to combing and drawing ”,Vol 3, The Textile Institute, Manchester, 1987
7. Klein W. “ A practical guide to ring spinning”,Vol 4, The Textile Institute, Manchester, 1987

U19PCL108B - PHYSICS AND CHEMISTRY LABORATORY
(For B.Tech. Fashion Technology)

L T P C
0 0 2 1

Course Outcomes: At the end of the course, the students will be able to,

CO1: Apply the principles of Optics, Thermal Physics, Electricity and Elasticity to determine the Engineering properties of materials.

CO2: Identify hardness and suggest the quality of water suitable for domestic purpose and analyze the concentration of carbonate, bicarbonate and hydroxide present in the given sample of water.

CO3: Determine the resistivity of the given copper turn used for house hold applications and determine the amount of pH of house hold water sample and suggest the remedial measures.

Pre-requisite: Capable of using Screw guage, Vernier calliper, Travelling microscope and Spectrometer

COs	CO/PO, PSO Mapping													
	(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak													
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)												PSO1	PSO2
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3			1		1					1			2
CO2	3			1		1					1			2
CO3	3			1		1					1			2

LIST OF EXPERIMENTS (PHYSICS PART)

1. Determination of velocity of ultrasonic waves and compressibility of the given liquid using ultrasonic interferometer.
2. Determination of dispersive power of the prism for various pairs of colors in the mercury spectrum using a spectrometer.
3. Determination of laser wavelength, particle size of lycopodium powder, acceptance angle and numerical aperture of an optical fibre using diode laser.
4. Determination of specific resistance of a given wire using Carey Foster's bridge.
5. Determination of the thermal conductivity of a bad conductor using Lee's Disc apparatus.
6. Determination of band gap of the given semiconductor diode.

(Any five experiments may be conducted from the above list)

List of Experiments (CHEMISTRY PART)

1. Estimation of hardness of water sample by EDTA method.
2. Estimation of alkalinity of water sample by indicator method.
3. Estimation of HCl by pH metry.
4. Estimation of HCl by conductometry. (HCl vs NaOH)
5. Estimation of ferrous ion by potentiometric titration.
6. Evaluate the iron content of the water by spectrophotometry.
(Any five experiments may be conducted from the above list)

Total: 30 Hours

U19FTL116 - FIBRE AND YARN ANALYTICAL LABORATORY

L T P C
0 0 2 1

Course Outcomes: At the end of the study of this course the students will be able to,

1. Identify the common textile fibres and determine the blend proportion of binary blends
2. Determine the physical properties like moisture regain, linear density, swelling behaviour of fibre and yarn / sewing thread characteristics like yarn type, yarn count and ticket number
3. Solve real time problems in fibre identification, fibre and yarn properties

		CO/PO, PSO Mapping														
		(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs		Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		3	3	2	3	3	3	3					3	3	2	3
CO2		3	3	2	3	3	3	3					3	3	2	3
CO3		3	3	2	3	2	3	3					3	2	2	2

LIST OF EXPERIMENTS

1. Identification of fibres by microscopy: longitudinal views of fibres
2. Identification of fibres by microscopy: cross-sectional views of fibres
3. Confirmation of fibres by means of the burning test
4. Confirmation of fibres by means of the solubility test
5. Identification of a textile fibre of unknown identity using microscopic, burning and solubility tests
6. Determination of blend proportion in fibre mixture / blended yarn / fabric.
7. Determination of the atmospheric conditions in the lab and the amount of moisture in given samples of conditioned and unconditioned fibre
8. Estimation of the crimp of man-made staple fibre and the denier by length and mass measurements
9.
 - (a) Identification of yarn type and twist direction and determination of yarn count of given spun yarn
 - (b) Identification of fibre type and determination of number of filaments and yarn linear density of given continuous filament yarn
 - (c) Identification of filament yarn and spun yarn

10. Identification of type of given sewing thread and determination of its ticket number and linear density

DEMONSTRATION

11. Identification of fibre by density test using density gradient column
12. Examination of the diametric swelling behaviour of cotton and viscose rayon fibres in water and alkali solution

SAMPLE COLLECTION

13. Collection of various fibre and yarn samples

TOTAL: 30 hours

U19CFTL117 - COMPUTER BASICS FOR FASHION TECHNOLOGY LABORATORY

L T P C
0 0 2 1

Course Outcomes: At the end of a study of this course the students will be able to,

1. Apply MS Excel tools in the analysis of apparel-production data.
2. Develop basic fashion sketches using fashion-CAD software and compile information on ancient fashion and latest fashion trends
3. Generate fashion ideas for garments using stated requirements and information related to ancient and current trends in the fashion industry

CO/PO, PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	1	2				2	2	3	2	2	3
CO2	3	3	3	2	3	2	2			1		3	2	3	3
CO3	3	3	3	3	1	2	2			2		2	2	3	3

BASICS OF MS EXCEL

1. Datasheet – Manipulating tools
2. Built-in functions
3. Basic analysis options for apparel-production data

BASICS OF CAD - FASHION ILLUSTRATOR SOFTWARE

4. CAD Tools I
5. CAD Tools II
6. Development of basic fashion sketches and simple designs

COLLECTION OF VARIOUS FASHION-DESIGN RELATED DATA

7. Collection of details about the origin and evaluation of costumes
8. Analysis of motifs, design, colour and materials used in Indian, Egyptian, Roman, French and English costumes
9. Collection of profiles of at least three popular Indian/International designers and their design collections (for two seasons)

TOTAL: 30 hours

U19GE101 - BASIC APTITUDE – I
(Common to All Departments)

L T P C
0 0 2 0

Course Outcomes: At the end of course, the students will be able to

CO1: Solve fundamental problems in specific areas of quantitative aptitude

CO2: Solve basic problems in stated areas of logical reasoning

CO3: Demonstrate rudimentary verbal aptitude skills in English with regard to specific topics

CO / PO, PSO Mapping														
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
COs, POs PSOs Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	1	2	2	2	1	3	3	3	3	1	1	3	2	2
CO 2	3	3	1	1	2	3	2	3	3	2	2	3	3	3
CO 3	1	2	1	2	1	1	1	3	3	3	1	3	3	3

1. Quantitative Aptitude and Logical Reasoning

Solving simple problems with reference to the following topics:

- a. Numbers – HCF & LCM
- b. Decimal fractions
- c. Square roots & cube roots
- d. Surds & Indices
- e. Logarithms
- f. Percentage
- g. Averages
- h. Coding and Decoding & Visual language

2. Verbal Aptitude

Demonstrating plain English language skills with reference to the following topics:

- a. Synonyms
- b. Antonyms
- c. Verbal analogy
- d. Editing passages
- e. Sentence filler words

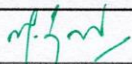
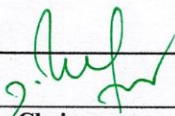
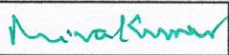
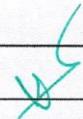
TOTAL: 30 hours

Sona College of Technology, Salem – 636 005
(An Autonomous Institution)
Courses of Study for BE/B Tech Semester II under Regulations 2019 (CBCS)
Branch: Fashion Technology

S.No	Course Code	Course Title	L	T	P	C	Category	Total Contact Hours
Theory								
1	U19MAT202E	Probability and Statistical Quality Control	3	1	0	4	BSC	60
2	U19PHY203E	Engineering Physics - II	3	0	0	3	BSC	45
3	U19CHE204C	Chemistry for Textile Technologists - II	3	0	0	3	BSC	45
4	U19BEE206A	Basics of Mechanical and Electrical Engineering	3	0	0	3	ESC	45
5	U19FT201	Woven Fabric Manufacture and Structure	3	0	0	3	PCC	45
6	U19EGR206B	Engineering Graphics for Fashion Designing	1	0	2	2	ESC	45 (15L+30P)
Practical								
7	U19ENL215	English for Engineers - II	0	0	2	1	HSC	30
8	U19FT202	Woven Fabric Structure and Textile CAD Laboratory	0	0	2	1	PCC	30
9	U19GE201	Basic Aptitude – II	0	0	2	0	EEC	30
Total Credits						20		
Optional Language Elective*								
10	U19OLE1201	French	0	0	2	1	HSMC	30
11	U19OLE1202	German						
12	U19OLE1203	Japanese						

*Students may opt for foreign languages viz., German/French/Japanese with additional one credit (Not accounted for CGPA calculation)

Approved by

			
Chairperson, Science and Humanities BoS	Chairperson, Fashion Technology BoS	Member Secretary, Academic Council	Chairperson, Academic Council & Principal
Dr. M. Renuga	Dr. D. Raja	Dr. R. Shivakumar	Dr. S. R. R. Senthil Kumar

Copy to:-HOD/ Fashion Technology, Second Semester BE FT Students and Staff, COE

B. TECH. / FASHION TECHNOLOGY

SEMESTER – II	PROBABILITY AND STATISTICAL QUALITY CONTROL	L	T	P	C
U19MAT202E		3	1	0	4

COURSE OUTCOMES

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

1. apply the concepts of probability, random variable and their properties to generate the moments.
2. fit the suitable distribution and its properties to the real world problems and interpret the results.
3. apply the concepts of joint probability distribution and its properties to find the covariance and transformation of random variables.
4. apply the various designs of experiments to find cause-and-effect relationships.
5. apply the process control techniques to control and maintain the quality of the product.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)												PSO1	PSO2	PSO3
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12			
CO1	3	3		3								2			3
CO2	3	3		3								2			3
CO3	3	3		3								2			3
CO4	3	3		3								2			3
CO5	3	3		3								2			3

UNIT – I RANDOM VARIABLES**12**

Discrete and continuous random variables – Moments – Expectation – Moment generating function and its properties.

UNIT – II PROBABILITY AND DISTRIBUTIONS**12**

Binomial, Poisson, Geometric, Uniform, Exponential and Normal distributions.

UNIT – III TWO DIMENSIONAL RANDOM VARIABLES**12**

Joint distributions – Marginal and conditional distributions – Covariance – Correlation – Central limit theorem.

UNIT – IV DESIGN OF EXPERIMENTS**12**

Analysis of variance – One way classification – Completely randomised design – Two way classification – Randomised block design – Latin square.

UNIT – V STATISTICAL QUALITY CONTROL

12

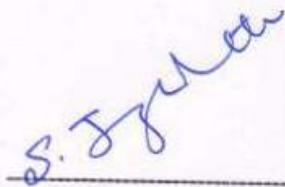
Control charts for measurements (\bar{X} and R charts) - Control charts for attributes, p , c and np
Charts – Examples of application of statistical control charts in garment industry.

Theory: **45 Hours**Tutorial: **15 Hours**Total: **60 Hours****TEXT BOOK:**

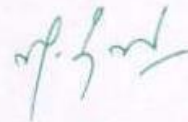
1. T. Veerarajan, "Probability, Statistics and Random Processes with Queueing Theory and Queueing Networks", McGraw Hill Publishers, 4th Edition, 7th reprint, 2018.

REFERENCE BOOKS:

1. S. C. Gupta, V. K. Kapoor, "Fundamentals of Mathematical Statistics", Sultan Chand and Sons Publishers, 11th Edition, Reprint, 2019.
2. S. P. Gupta, "Statistical Methods", Sultan Chand and Sons Publishers, 15th Edition, 2012.
3. R. A. Johnson and C. B. Gupta, "Miller and Freund's, Probability and Statistics for Engineers", Pearson Publishers, 9th Edition, 2018.
4. S. Ross, "A first course in probability", Pearson Publishers, 9th Edition, 2019.
5. P. G. Hoel, S. C. Port and C. J. Stone, "Introduction to Probability Theory", Universal Book Stall Publishers, Reprint, 2003.
6. W. Feller, "An Introduction to Probability Theory and its Applications", Vol. 1, 3rd Edition, Wiley Publishers, 2008.



Prof. S. JAYABHARATHI
Head / Department of Mathematics
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Dr. M. RENUGA
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Salem – 636 005

Course Code:
Course Name:

U19PHY203E
Engineering Physics II

L T P C
3 0 0 3 100

(for Fashion Technology)

COURSE OUTCOMES:

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

- CO1** Differentiate the electrical and thermal conductivity of metals.
- CO2** Discuss the three moduli of elasticity in detail.
- CO3** Apply hydrodynamic principles for the flow of liquids.
- CO4** Elucidate the elastic, anelastic and visco-elastic behaviour of materials.
- CO5** Evaluate the novel properties of phase change materials, shape memory polymers and nanomaterials.

CO / PO, PSO Mapping														
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
COs, POs, PSOs Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO – 1	3	2	-	-	-	-	-	-	-	-	2	2	-	3
CO – 2	3	2	-	-	-	-	-	-	-	-	2	2	-	3
CO – 3	3	2	-	-	-	-	-	-	-	-	2	2	-	3
CO – 4	3	2	-	-	-	-	-	-	-	-	2	2	-	3
CO - 5	3	2	-	-	-	-	-	-	-	-	2	2	-	3

Unit 1 Conducting materials

9

Usage of conducting materials– basic definitions (electrical resistance-conductance-resistivity-conductivity).

Classical free electron theory of metals - postulates of classical free electron theory - microscopic form of Ohm’s law - Electrical conductivity - definition and expression for electrical conductivity - thermal conductivity - definition and expression for thermal conductivity

– Wiedemann - Franz law and Lorentz number - Success and failure of classical free electron theory.

Quantum free electron theory - Drawbacks of quantum free electron theory - origin of energy bands - band theory of solids (qualitative treatment only) - Fermi energy and Fermi distribution function – Effect of temperature on Fermi function - Density of energy states - carrier concentration in metals - Electrically conductive textiles.

Unit 2 Elastic properties of materials

9

Stress-Strain - Hooke's law - Modulus of elasticity - Young's modulus - Rigidity modulus - Bulk modulus - Poisson's ratio – stress - strain diagram - applications of stress - strain diagram - factors affecting elasticity.

Bending of beams –expression for bending moment – elevation produced at the midpoint of the beam-Measurement of Young's modulus by uniform bending- Cantilever depression produced at the loaded end of the beam-depression produced at the midpoint of the beam- Measurement of Young's modulus by non uniform bending- I shaped girders.

Torsion pendulum - Work done in twisting a wire - Expression for couple per unit twist - Determination of rigidity modulus of thin wire by torsion pendulum.

Unit 3 Hydrodynamics

9

Viscosity - Stream line motion - Turbulent motion - Reynold's number - Determination of viscosity of fluids - Poiseuille's method.

Surface Tension - Molecular forces - Surface energy and surface tension - Rise of liquids in a capillary tube - Determination of surface tension by capillary rise method - Applications: Detergents and surface tension.

Moisture absorption in fibres - Humidity and its importance in Textiles - definition of humidity, Absolute humidity, Relative humidity, Recommended allowance, Regain and moisture content.

Unit 4 Elastic, Inelastic and Viscoelastic behavior

9

Elastic behavior: Atomic model of elastic behavior - Modulus as a parameter in design, stiffness - Rubber like elasticity: Elastomers - coiling and uncoiling of an elastomer chain - Stress strain curve for elastomer molecule.

Anelastic behavior - Relaxation processes-damping capacity - Visco-elastic behavior - Spring dashpot models - Maxwell element - Voigt-Kelvin element - Four parameter model, Retarded elasticity, Entropy elasticity.

Unit 5 New engineering materials

9

Phase change materials - Basic information of phase change materials - Phase change technology-PCM in textiles - Shape memory polymers (SMPs) - Introduction ,Features, properties, classifications and applications.

Nanoscience and Nanotechnology - significance of the nanoscale - different types of nanostructures (Confinement Dimensions 0-D, 1-D, 2-D and 3-D) - Categories of nanomaterials - Fabrication of nonomaterials - Ball milling method and Chemical vapour deposition technique - Applications.

Lecture: 45, Tutorial: 00, Total: 45 Hours

Text Book:

1. M.N.Avadhanulu, 'Engineering Physics' S.Chand &Company Ltd, New Delhi (2015)
- 2.Subramaniam. N, Brijlal, ' Properties of Matter', S. Chand Group, New Delhi (2007)
(Unit II)

References:

1. 'Applied Physics', Sonaversity, Sona College of Technology, Salem (Revised edition, 2015).
2. Physics for Mechanical Engineering, Sonaversity, Sona College of Technology, Salem (Revised Edition 2016).
3. Rajendran, V, and Marikani A, 'Materials science' TMH Publications, (2004) New Delhi.
4. Palanisamy P.K, 'Materials science', SciTech Publications (India) Pvt. Ltd., Chennai, Second Edition (2007)

COURSE CODE	U19CHE204C	L T P C
COURSE NAME	CHEMISTRY FOR TEXTILE TECHNOLOGISTS –II	3 0 0 3

Course outcome:

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

- CO1** Compare the various types of organic material used in textile industry and their structure activity relationship and also can replace alternative environmental organic substituents.
- CO2** Analyze various types of inorganic materials used in textile industry and their mechanistic way in those application and preparation, uses in textile industry.
- CO3** Analyze the types of fibre forming polymers, polymerization and characteristics of Polymers.
- CO4** Discuss topics related to various types of modern washing machines and highlight the importance of using industrial cleaning agents and label care.
- CO5** Give an account of the principles and practices of stain removal in textiles / garments and describe the applications of stiffening agents to textiles.

CO / PO, PSO Mapping

(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

Programme Outcomes (POs) and Programme Specific Outcome (PSOs)

COs, POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
PSOs Mappin														
CO – 1	3	2												3
CO – 2	3	2												3
CO – 3	3	2												3
CO – 4	3	2												3
CO - 5	3	2												3

UNIT I: ORGANIC COMPOUNDS FOR TEXTILE INDUSTRY

9

Cellulose – structure of cellulose – derivatives of cellulose – carboxymethyl cellulose and Gun cotton – structural aspects of cellulose –waxes - classification of waxes - Organic dyes – introduction – colour and chemical constitution – classification of dyes by structure – examples only– classification of dyes by methods of application – direct dyes – vat dyes – mordant dyes - azo dyes – disperse dyes – reactive dyes – examples only - chemistry of reactive dyes – Textile

auxiliaries – dyeing auxiliaries – optical brighteners – printing auxiliaries – synthetic softeners – wetting agents, etc.

UNIT II: INORGANIC COMPOUNDS FOR TEXTILE INDUSTRY 9

Zeolites – types – applications – ion exchange properties of pigments – white pigments- titanium dioxide – lithophone – zinc oxide – coloured pigments - iron oxide – ultramarine – bleaching agents – Oxidizing bleaching agents, calcium hypochlorite, hydrogen peroxide, Reducing bleaching agents- sulphur dioxide and sodium hyposulphite, Applications of Chemistry in textile technology.

UNIT III: POLYMERS 9

Polymers: Terminology related to fibre molecules-classification of polymers; polymer-monomer-copolymer-types of fibre forming polymers; homo polymer-copolymer-alternating copolymer-random copolymer-block copolymer-graft copolymer-types of polymerization: addition-condensation and copolymerization-properties of polymers.

UNIT IV: LAUNDRY EQUIPMENT WITH CARE LABELS AND LAUNDRY REAGENTS 9

Washing Machines: Methods of washing, manual and machine washing. Study of modern/industrial washing machines: Rotary, swirling, pressure, tumble type washing machines laundering specialty fabrics and Care Labels: Importance of care label, various systems of care labelling, placement of labels on garments.

Laundry reagents: Soaps, detergents, cleaning action of soaps, indigenous cleaning agents, industrial cleaning agents, application of perchloroethylene, acetone and petrol. Study on modern cleaning agents.

UNIT V: STAIN REMOVAL AND STIFFENING 9

Stain Removal: Principles of stain removal, classification of stains and stain removers, various solvents for removing stains like blood, tea, rust, oil/grease, ink, candle wax, fruit juice, gum and other handling stains, stain removal procedure in garment industries.

Stiffening: Stiffening agents, purpose of stiffening and classification of stiffening agents, preparation and uses of stiffeners, steps in stiffening process.

Total: 45 Hours

TEXT BOOKS

1. P.C.Jain and Monica Jain, “Engineering Chemistry” Dhanpat Rai Pub, Co., New Delhi, 2018 (17th Edition).
2. N. Panneer Selvam et al., “Chemistry For Textile Technologists – II” by Sonaversity, Sona College of Technology, Salem, 2019.

REFERENCE BOOKS

1. O.G. Palanna “Engineering Chemistry” Tata McGraw-Hill Pub.Co.Ltd, New Delhi, 2017.
2. Kannan P., Ravikrishnan A., “Engineering Chemistry”, Sri Krishna Hi-tech Publishing Company Pvt. Ltd., Chennai, 2016.
3. H.K. Chopra, A. Parmer, “Chemistry for Engineers”, Narosa Publishing House, New Delhi, 110 002, 2016.
4. Gowariker V.R. , Viswanathan N.V. and Jayadev Sreedhar, “Polymer Science”, New Age International P (Ltd.), Chennai, 2006
5. Gurdeep R. Chatwal, “Synthetic Organic Chemistry”, Himalaya Publishing House, Mumbai, 1994.
6. Dr. C.V. Koushik and Antao Irwin Josico, “Chemical Processing of Textiles Preparatory Processes and Dyeing”, NCUTE Publication, New Delhi – 110 016.
7. Dantiyagi S., “Fundamentals of Textile and Their Care”, Oriental Longmans Ltd, New Delhi, 1996.
8. Noemia D’Souza, “Fabric Care”, New Age International (P) Ltd. Publishers, Chennai, 1998.
9. Shenai V. A., “Technology of Textile Finishing”, Sevak Publications, Bombay, 1995.
10. Davis, “Laundry and Clothing Care”, Drama Book Publishers, 1995.

Course Outcome: At the end of the course, the students will be able to

1. Summarise the principle of operation of various conventional power plants and explain the components
2. Discuss the working principles of Refrigerators and Air conditioner used in domestic purposes
3. State the fundamental laws of electrical circuits and explain the basic principles related to DC and AC electrical circuits
4. Explain the constructional features and principles of operation of DC and AC motors
5. Explain the different types of electrical drives and its heating and cooling curves.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	1	-	2	1	-	1	2	-	2	1	1
CO2	2	1	1	1	-	2	1	-	1	2	-	2	1	1
CO3	2	2	1	1	1	2	1	-	2	2	2	2	1	1
CO4	2	2	1	1	1	2	1	-	2	2	2	2	1	1
CO5	2	2	1	1	2	1	1	1	2	2	2	2	1	1

UNIT I - POWER PLANT ENGINEERING

9

Introduction, Classification of power plants-working of steam, gas, diesel, hydro- electric, nuclear power plants; Pumps-working principle of reciprocating and centrifugal pumps. Boilers: types, applications of Cochran, Lamont, Benson, Babcock- Wilcox boilers; Properties of steam; Dryness fraction, latent heat, Total heat of wet steam, Superheated steam; Use of steam tables; Volume of wet steam; Volume of superheated steam.

UNIT II - REFRIGERATION AND AIR CONDITIONING

9

Terminology of refrigeration and air conditioning; Principle of vapour compression and absorption system-window and split type air conditioner

Compressor – Classification, Working of reciprocating and rotary air compressors, Applications.

UNIT III - DC AND AC CIRCUITS

10

DC Circuits: Ohm's law, Kirchoff's laws, Series and Parallel circuits, Star – Delta transformation – Simple Problems.

AC Circuits: AC waveform standard terminologies, Single phase RL, RC, RLC series circuits – Simple Problems. Introduction to three phase circuits.

UNIT IV - DC AND AC MOTORS

10

DC motors: Construction - Principle of operation - Torque equation - Types -Characteristics - Applications.

Three Phase Induction Motor: Construction- Principle of operation- Torque Equation

- Slip - Torque vs Slip characteristics - Applications.

UNIT V - ELECTRICAL DRIVES

7

Basic Electrical Drives – Types of Electric Drive – Types of Load – Classes of Duty –Factors Affecting Selection of Electric Drives – Heating and Cooling Curve.

TOTAL: 45 Hours

TEXT BOOKS

1. Shunmagam G, Ravindran S, “**Basic Mechanical Engineering**”, TataMcGraw Hill, 2011.
2. V.K. Mehta and Rohit Mehta, “**Principles of Electrical Engineering and Electronics**”, S. Chand publishers, 2015.

REFERENCES

1. Venugopal K, Prabhuraja V, “ **Basic Mechanical Engineering**”, Anuradha Agencies, 2014
2. S.R.J. Shantha Kumar, “**Basic Mechanical Engineering**”, 2nd Edition, Hi-Tech Publications, 2000.
3. S.K. Bhattacharya, “**Basic Electrical and Electronics Engineering**”, Pearson publishers, 2016
4. D.P. Kothari and I.J. Nagrath, ‘**Electric Machines**’, Tata McGraw Hill, 2010.
5. B.L. Theraja, “Fundamentals of Electrical Engineering and Electronics”, S.Chand publishers, 2008.
6. SudhakarA and Shyam Mohan SP, Circuits and Network Analysis andSynthesis”, Tata McGraw Hill, 2015.

Course Outcome:

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

1. Explain the winding, warping, sizing, drawing-in, denting and knotting process.
2. Describe the working principles of various loom mechanisms.
3. Explain the various principles of weft insertion in shuttle less looms and modern weaving.
4. Explain the elementary features of woven design and explain the construction of different elementary weaves with appropriate diagrams
5. Illustrate the design of dobby, jacquard, mock leno and pile fabrics.

		CO/PO, PSO Mapping														
		(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO1	2	2	3	2	2							2	2	2	2	
CO2	3	3	3	3	3	2	2			2	3	2	3	3	2	
CO3	2	3	3	3	3	2					2	2	3	2	2	
CO4	2	3	3	3	3					2	2	2	3	3	2	
CO5	2	3	3	3	3	2					2	2	3	3	2	

UNIT I Weaving Preparatory Processes**9**

Winding: Objectives and yarn passage in cone winding machines, Objectives and yarn passage in pirn winding machine. **Warping machine:** Objectives, types and material passage. **Sizing:** Objects of sizing and list of sizing ingredients; drawing-in, denting and knotting.

UNIT II Basics of Loom Mechanisms**10**

Looms: Types of looms. **Basic motions:** Primary, secondary and auxiliary motions.

Primary mechanisms: Principles of Shedding: Dobby and Jacquard. Principle of Picking and beat up.

Secondary mechanisms: Principle of take-up and let-off motions.

Objectives of Auxiliary mechanisms: Warp protector mechanism, Warp stop motion, weft stop motion, temples and brakes.

UNIT III Shuttleless Looms 8

Shuttleless weaving machines: Principles of weft insertion by projectile, rapier, air jet and water jet. Types of selvages, Multi-phase weaving and 3D fabrics.

UNIT IV Elementary Weaves 9

Elements of woven design: Design, Draft and its types, Peg plan and Repeat

Construction of elementary weaves: Plain weave and its derivatives: warp rib, weft rib and matt rib, Twill weave and its derivatives: ordinary twill, herringbone twill and zigzag twill, Satin, Sateen and their derivatives; Honeycomb, Ordinary and Brighton honeycomb, huck a back, Crepe weave and its modifications.

UNIT V Dobby and Jacquard Design 9

Spot figuring: Basic doobby, Jacquard designs, Arrangement of motifs in doobby and Jacquard designs; Extra-warp and extra-weft figuring.

Mock leno: Perforated mock leno design; Pile fabrics: plain velveteen and corduroys; Colour and weave effects; Principle of Double cloth construction; Fabric structures and its commercial name.

TOTAL: 45 Hours

TEXT BOOKS

1. Talukdar M. K., Sriramulu P. K. and Ajgaonkar D. B., "Weaving: Machines, Mechanisms, Management", Mahajan Publishers Pvt Ltd, 2004
2. Gokarneshan N., "Fabric Structure and Design", New Age International (P) Limited, 2009

REFERENCE:

1. W.S. Murphy, "Textile weaving and Design", Abhishek Publications, 2007.
2. H. Nisbet, "Grammar of Textile Design", Taraporewala and Sons Co. Pvt. Ltd., 1994

3. Grosicki, Watson's Textile design and colour, Elementary weaves and figured fabrics, Butterworth & Co publishers ltd.

U19EGR206B – ENGINEERING GRAPHICS FOR FASHION DESIGNING

L T P C
1 0 2 2

Course Outcome: At the end of the course, the students will be able to

1. predict the construction of various curves in civil elevation plan and machine components.
2. draw the projection of three dimensional objects representation of machine structure and explain standards of orthographic views by different methods.
3. analyze the principles of projection of various planes by different angle to project points, lines and planes and simple solids.
4. study the development of simple solids and surfaces
5. create fabric print design, garment designs and illustrate the human figures.

CONCEPTS AND CONVENTIONS (Not for Examination) 9

Importance of graphics in engineering applications, Use of drafting instrument, BIS conventions and specifications - Size, layout and folding of drawing sheets, Lettering and dimensioning.

COMPUTER AIDED DRAFTING (Not for Examination) 9

Importance 2d Drafting, sketching, modifying, transforming and dimensioning.

UNIT I – PLANE CURVES (Free hand sketching) 9

Curves used in engineering practices Conics – Construction of ellipse – Parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square and circle – Drawing of tangents and normal to the above curves.

UNIT II – ISOMETRIC TO ORTHOGRAPHIC VIEWS (Free Hand Sketching)

9

Representation of three dimensional objects – General Principles of Orthographic projection – Need for importance of multiple views and their placement – First angle projection – layout of views – Developing visualization skills through free hand sketching of multiple views from pictorial views of objects.

UNIT III – PROJECTION OF POINTS, LINES PLANE SURFACES (Free hand sketching and 2D Software) 9

Projection of points- All 4 quadrants, lines- Perpendicular to H.P and parallel to V.P, Perpendicular to V.P and parallel to H.P ,Inclined to H.P parallel to V.P, inclined to V.P and parallel to H.P, Planes – inclined to any one of the reference plane, Solids – prism, pyramid, cylinder and cone – resting on H.P and resting on V.P-simple positions.

UNIT IV – SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES (Free hand sketching and 2D Software) 9

Sectioning of simple solids like prisms – pyramids, cylinder and cone in simple vertical position by cutting planes inclined to one reference plane and perpendicular to the other, Development of lateral surfaces of simple and truncated solids – Prisms – pyramids – cylinders and cones.

UNIT V - FASHION DESIGNING 9

(2D CAD software) Creation of fabric print design - garment design - Illustration of three different poses of fashion figure.

(Not for Examination)-Paper craft models preparation of simple and truncated solids – Prisms – pyramids – cylinders and cones.

TEXT BOOK

1. P. Suresh, “Engineering Graphics and Drawing”, Sonaversity, Sona College of Technology, Salem, Revised edition, 2012.

REFERENCES

1. Manmeet sodhia, “Fashion Illustration”, Kalyani publishers, Ludhiana, Newdelhi, 2008.
2. Caroline Tatham and Julian Seaman, “Fashion Designing and Drawingcourse” Thames and Hudson Publishers, 2003.

TOTAL: 45 Hours

U19ENL215-English for Engineers – II

First year II semester

FT

Course Outcomes: At the end of the course, the students will be able to

1. Demonstrate effective listening skills for academic and professional purposes.
2. Draw conclusions on explicit and implicit oral information.
3. Develop effective reading skills and reinforce skills required for grammar and building vocabulary.
4. Read for gathering and understanding information, following directions and giving responses
5. Introduce themselves, initiate and participate in conversations, deliver speeches and technical presentations

	COURSE OUTCOMES	PROGRAMME OUTCOMES												Pso 1	Pso 2
		1	2	3	4	5	6	7	8	9	10	11	12		
1	Demonstrate effective listening skills for academic and professional purposes	2	2	2	2	1	2	3	3	3	3	2	3	3	3
2	Draw conclusions on explicit and implicit oral information	3	3	2	3	3	2	3	3	3	3	3	3	3	3
3	Develop effective reading skills and reinforce skills required for grammar and building vocabulary	3	3	2	3	2	3	3	3	3	3	3	3	3	3
4	Read for gathering and understanding information, following directions and giving responses	2	3	2	3	2	3	3	3	3	3	3	3	3	3
5	Introduce themselves, initiate and participate in conversations, deliver speeches and technical presentations	1	2	2	3	2	2	3	2	3	3	2	3	3	3

LISTENING

- Listening to conversations, welcome speeches, lectures and description of equipment. • Listening to different kinds of interviews (face-to-face, radio, TV and telephone interviews). Understanding short conversations or monologues. • Taking down phone messages, orders, notes etc. • Listening for gist, identifying topic, context or function.
- Listening comprehension, entering information in tabular form. • Intensive listening exercises and completing the steps of a process.
- Listening exercises to categorise data in tables.
- Listening to extended speech for detail and inference.

READING

- Understanding notices, messages, timetables, advertisements, graphs, etc.
- Reading passages for specific information transfer.
- Reading documents for business and general contexts and interpreting graphical representations.
- Error correction, editing mistakes in grammar, vocabulary, spelling, etc.
- Reading passage with multiple choice questions, reading for gist and reading for specific information, skimming for comprehending the general idea, meaning and contents of the whole text.

SPEAKING

- Self-introduction, personal information, name, home background, study details, area of interest, hobbies, strengths and weaknesses, projects and paper presentations, likes and dislikes in food, travel, clothes, special features of home town.
- Welcome address, vote of thanks, special address on specific topics.
- Mini presentation in small groups of two or three regarding, office arrangements, facilities, office functions, sales, purchases, training recruitment, advertising, applying for financial assistance, applying for a job, team work, discussion, presentation
- Situational role play between examiner and candidate, teacher and student, customer and sales manager, hotel manager and organiser, team leader and team member, bank manager and candidate, interviewer and applicant, car driver and client, industrialist and candidate, receptionist and appointment seeker, new employee and manager, employee and employee, P.A. and manager, schedule for training, asking for directions, seeking help with office equipment, clarifying an error in the bill, job details, buying a product, selling a product, designing a website, cancelling and fixing appointments, hotel accommodation, training facilities, dress code, conference facilities.

Extensive Reading

1. You Can Win by Shiv Khera - Macmillan *Publishers* India
2. Who Moved my Cheese? – Spencer Johnson-G. P. Putnam's Sons
3. Discover the Diamond in You – Arindham Chaudhari – Vikas publishing House Pvt.
4. The Story of Amazon-com – Sara Gilbert, published by Jaico
5. The Story of Google – Sara Gilbert, published by Jaico

TOTAL: 30 hours

Course Outcome:**At the end of the course, the students will be able to**

1. Analyse the common woven fabrics and develop the related design, draft and peg plan
2. Determine the cloth particulars for given fabrics
3. Utilise effectively the different tools in textile CAD software and create/develop different textile design and prepare their 2D simulations

		CO/PO, PSO Mapping														
		(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
		Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
COs		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
	CO1		2	2	2	2	2	2							2	2
CO2		2	2	2	2	2	2					2		2	2	2
CO3		2	2	2	2		3							2	2	2

List of Experiments

Analyse the structures of woven fabric Designs

1. Plain, Twill, Satin.(2 session)
2. Huck a back and Honey comb.(1 session)
3. Dobby cloth analysis. (1 session)
4. Jacquard cloth (1 session)
5. Extra warp and extra weft figuring. (1 sessions)
6. Pile fabrics – corduroy fabrics. (1 session)

Study and practice of

1. Different tools used in textile CAD software. (1 session)
2. Development of striped, checked and print design and preparation of its 2D simulation. (1 session)
3. Development of dobby design and preparation of its 2D simulation. (1 session)
4. Development of jacquard design and preparation of its 2D simulation. (1 session)

TOTAL: 30 Hours

U19GE201 - BASIC APTITUDE - II

L T P C
0 0 2 0

Course Outcomes: At the end of the course, the students will be able to CO1
solve more elaborate problems than those in BA-I in specific areas of

quantitative aptitude.

CO2 solve problems of greater intricacy than those in BA-I in stated areas of logical reasoning.

CO3 demonstrate higher than BA-I level verbal aptitude skills in English with regard to specific topics.

List of Experiments

1. QUANTITATIVE APTITUDE AND LOGICAL REASONING

Solving quantitative aptitude and logical reasoning problems with reference to the following topics:

- a. Ratio and proportion
- b. Partnership
- c. Chain rule
- d. Ages
- e. Profit, loss and discount
- f. Geometry
- g. Area and volume
- h. Data arrangement

2. VERBAL APTITUDE

Demonstrating verbal aptitude skills in English with reference to the following topics:

- a. Jumbled sentences
- b. Reconstructions of sentences (PQRS)
- c. Sentence fillers two words
- d. Idioms and phrases
- e. Spotting errors
- f. Writing captions for given pictures

TOTAL : 24 Hours

Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester III under Regulations 2019
Branch: Fashion Technology

S. No	Course Code	Course Title	Lecture	Tutorial	Practical	Credit	Total Contact Hours
Theory							
1	U19MAT301E	Operations Research and Statistical Methods	3	1	0	4	60
2	U19FT301	Knitted Fabric Manufacture and Structure (lab integrated)	3	0	2	4	75
3	U19FT302	Chemical Processing of Textiles and Garments (Lab Integrated)	3	0	2	4	75
4	U19FT303	Fashion Art and Design	3	0	0	3	45
5	U19FT304	Pattern Making and Garment Construction - I	3	0	0	3	45
6	U19GE304	Mandatory Course : Constitution of India	2	0	0	0	30
Practical							
7	U19FT305	Pattern Making and Garment Construction Laboratory - I	0	0	2	1	30
8	U19FT306	Digital Fashion Design Laboratory	0	0	4	2	60
9	U19ENG301	Communication Skills Laboratory	0	0	2	1	30
10	U19GE301	Soft Skills and Aptitude – I	0	0	2	1	30
Total Credits						23	

Approved By

Chairman, Fashion Technology BoS

Dr.D.Raja

Member Secretary, Academic Council

Dr.R.Shivakumar

Chairperson, Academic Council & Principal

Dr.S.R.R.Senthil Kumar

Copy to:-

HOD/Fashion Technology, Third Semester B.Tech FT Students and Staff, COE

COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Describe the basic terms, specifications and functions of weft and warp knitting machines.
2. Develop a clear understanding of different stitches and pattern mechanisms used for the production of weft knitted fabrics
3. Identify the different structures of the basic weft knitted structures and its derivatives
4. Identify and explain the representation of weft and warp knitted fabrics
5. Analyse the methods of production and the applications of common types of nonwoven fabrics
6. Analyse the knitted fabrics and develop the design
7. Analyse the geometrical properties for given fabrics
8. Experiment on Settings of machine parameters

CO/PO, PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	2	2	1	2	2						1	1	3	2	2
CO2	1	2	3	2	3	2				1		2	2	2	1
CO3	2	3	3	3	3	2	2			1		3	3	3	1
CO4	1	2	3	3	2	1	2			1		3	3	3	1
CO5	2	3	2	1	3		2					2	3	2	2
CO6	2	3	3	3	3		2					3	3	3	1
CO7	2	3	3	3	3		2					1	3	3	1
CO8	2	3	3									1	3	3	1

UNIT I

Weft Knitting

10

Introduction: Introduction and basic concepts of Knitting, Principles of weft and warp knitting – comparison of weft and warp knitting

Weft Knitting: Functional Elements: Needles, Loop forming sequence, Sinkers, Cylinder, Dial, Cams, Creel, Feeder, Fabric Spreader, Take down and winding Mechanism. Machine description - Single Jersey, Rib, Purl and Interlock machine –Fully fashioned garments: socks, gloves, sweaters

UNIT II Knit Stitches, Basic weft Knit Structures and Pattern Mechanism 14

Knit stitch, float stitch, tucks stitch: Properties, Symbolic and diagrammatic representation of stitches.

Basic Weft Knitted Structures: Single Jersey, Rib, Purl and Interlock. Line, Symbolic and diagrammatic notations of basic weft knitted structures, Characteristics and application areas of basic weft knit structures.

Patterning mechanism: Pattern wheel, Pattern drum, Peg drum machine, pattern jack, computerized jacquard knitting machines, Electronic devices for needle selection

UNIT III Derivatives of Plain Jersey, Rib and Interlock Structures 14

Derivatives of plain knit: Pique, honeycomb, Lacoste, cross tuck, satin, Knitted twill, Jersey blister, Plaiting, seer sucker effect, accordion fabrics.

Derivatives of Rib knit: 2x2 Rib, 3x2 Rib, 5x1 Derby rib, Regular and irregular rib fabrics, half cardigan, Full cardigan Milano rib, Waffle, Flat back rib.

Derivatives of Purl knit: 2x2 Purl, 4x2 Purl, and Basket Purl

Derivatives of Interlock Structure: Eight lock, Ponte-di-roma, Texi-pique, Milano rib, plated structure

Striped patterns: Horizontal stripe patterns, Vertical stripe patterns, Square patterns. Fabric structure and its commercial name.

UNIT IV Warp knitting and Structures 14

Warp knitting: Classification, Functional Elements: Overlap and Underlap, Machine elements: Needle bar, Sinker bar, Guide bar, Presser bar, Warp beam, Pattern wheel, Chain links, Latch wire, Trick plate, Knitting Cycle of Tricot and Raschel machine.

Principle stitches of warp knitting: 1 and 1 lapping – pillar or chain stitch – in lay stitch – blind stitch – 2 and 1 lapping – longer lapping – atlas stitch.

Study and representation: Full Tricot, Locknit, Reverse Locknit, Satin, Shark Skin, Queen's cord. Fabric structure and its commercial name. Application areas of warp knit structure

UNIT V Interlining Fabrics (Non-Woven Fabric) 9

Interlining: Types (Woven, knit and non-woven) , Properties, and end uses. Non-woven Interlining: Method of non-woven fabric manufacture: Mechanical bonded, Chemical bonded, Thermal bonded, Spun bonded and Melt blown. Applications of non-woven fabrics.

Total: 75 hours (45 L + 30 P)

LIST OF EXERCISES

Analysis of KNIT FABRIC PARAMETERS: CPI, WPI, LOOP LENGTH, GSM,

YARN COUNT, FABRIC THICKNESS for the following knit samples.

Analyse the given single jersey structure and its derivatives (2 session)

1. Analyse the given rib structure and its derivatives (2 session)
2. Analyse the given interlock structure and its derivatives (2 session)
3. Analyse the given jacquard knitted structure (1 session)
4. Analyse the basic geometrical properties of knitted fabrics (1 session)
5. Experiment on Settings of machine parameters to attain different GSM of knitted fabric

TEXT BOOK:

1. Anbumani N., Knitting-Fundamentals, Machines, Structures and Developments, New Age International Publishers, 2007.

REFERENCE:

1. Ajgaonkar D.B., Knitted Technology, Universal Publishing Corporation, Mumbai, 1998.
2. Spencer D.J., Knitting Technology: A Comprehensive Handbook, Woodhead Publishing Limited, England, 3rd Edition, 2001.

KNITTED FABRIC MANUFACTURE AND STRUCTURE

(LAB INTEGRATED)

List of equipment required for a batch of 30 students for U.G

S. No.	Name of the equipment / software	Quantity Required
1.	GSM Cutter and Scale	2
2.	Beesley Balance	4
3.	Course length tester	1
4.	Counting Glass	30
5.	Electronic Balance	1
6.	Fabric Thickness Tester	1
Total		39

COURSE OUTCOMES

At the end of the study of this course the students should be able to,

1. Explain the various grey preparatory processes for woven and knitted fabrics.
2. Describe the process of dyeing of cotton with direct, reactive and vat dyes.
3. Analyse the process of dyeing of Polyester and PC Blends with disperse dyes.
4. Explain various methods and styles of printing.
5. Describe the evaluation procedure of dyed and printed materials.
6. Prepare the grey fabric for dyeing and printing
7. Dye and print the fabric with suitable dyes
8. Test the dyed and printed fabrics for its fastness

CO/PO, PSO Mapping

(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

CO s	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO 1	2							1				1			
CO 2	3							1				1	1		
CO 3	2	1					3	1				1	1	1	
CO 4	3	2	2				3	1				1	1	1	
CO 5	2		2		1			1		2		1	3		1
CO 6	3	2	2				3	1				1	1	1	
CO 7	3	2	2				3	1				1	1	1	
CO 8	3	2	2		2	2	3	1		2		1	2	1	

UNIT - I Grey Preparation

9

Singeing: Objectives of singeing.

Desizing: Objectives, enzyme desizing, their relative advantages and disadvantages.

Principle and working of machines used in grey preparation: padding mangles, jigger, winch, J-box.

Scouring: Purpose and process, continuous methods of scouring.

Bleaching: Bleaching of cotton goods with hydrogen peroxide.

Mercerisation: Objective and principle of fabric mercerisation; outline of pad-less chainless fabric mercerisation.

UNIT - II **Dyeing of Natural Fibres** **9**

Fundamentals: Classification of colorants, difference between dye and pigment, common terms used in textile colouration.

Direct dyes: Properties and classification, dyeing of cotton with direct dyes.

Reactive dyes: Properties and classification, dyeing of cotton with M and VS reactive dyes

Acid Dyes: Dyeing of silk and wool.

UNIT - III **Dyeing of Polyester and PC Blends** **9**

Disperse dyes: Properties and classification, dyeing of polyester with disperse dyes using Jet dyeing machine and continuous methods.

Dyeing of PC Blends: Polyester/cellulosic blends dyeing by one and two bath process.

Dyeing equipment: Principles of working of soft-overflow jet dyeing machine, garment dyeing machines.

UNIT - IV **Printing** **9**

Methods of printing: Principles of block, batik, flat-bed, rotary screen and transfer printing; study of chest printing machine for knitted goods, Digital printing.

Styles of printing: Principles of direct, discharge and resist styles of printing; printing with reactive dyes and pigments.

UNIT – V **Fabric finishes, Dyeing, Printing and Quality Evaluation** **9**

Computer colour matching: Principles of computer colour matching system; pass/fail decision making.

Colour fastness: Assessment of colour fastness of dyed goods to washing, rubbing, light and perspiration.

Banned dyes and Chemicals.

Dyeing and Printing faults: Dyeing and printing faults.

Fabric Finishes: Basic principles of calendaring, raising, sanforising, compacting of knitted fabric and softening finish.

LIST OF EXERCISES

1. Bleaching of cotton using hydrogen peroxide. (1 session)
2. Dyeing of cotton with M brand reactive dyes. (1 session)
3. Dyeing of silk / wool with acid dyes (1 sessions)
4. Printing of fabric (Screen, block and resist) (1 session)
5. Printing of fabric (tie & dye, batik, transfer) (1 session)
6. Determination of colour fastness to washing, rubbing and light fastness. (2 sessions)
fabric – To be added in testing laboratory.

Total: 75 hours (45 L + 30 P)

TEXTBOOKS:

1. Koushik C. V., and Antao Irwin Josico, “Chemical Processing of Textiles – Grey Preparation and Dyeing” – NCUTE Publication, New Delhi, 2004 (Units 1, 2 and 5)
2. Shenai V. A., “Technology of Finishing”, Sevak Publications, Mumbai, 1995, Nitra, “Pollution Control in Textile”
3. D G Dugg and S Sinclair, “Giles's Laboratory Course in Dyeing”, Woodhead Publishing Limited (Fourth edition) December 1989

REFERENCE:

1. Shenai V. A., “Technology of Textile Processing – Vol. III, IV, V, VII and VIII”, Sevak Publications, Mumbai, 1995
2. Palmer John W., “Textile Processing and Finishing Aids: Recent Advances”, Mahajan Book Distributors, 1996
3. Ronald James W., “Printing and Dyeing of Fabrics and Plastics”, Mahajan Book Distributors, 1996
4. Sivaramakrishnan C. N. “ A compilation of 10 papers”, Colorage
5. L. W. C Wiles, “Textile Printing”, Merrow Monographs. Textile Technology.

CHEMICAL PROCESSING OF TEXTILES AND GARMENTS**(LAB INTEGRATED)****List of equipment required for a batch of 30 students for U.G**

S. No.	Description of Equipment / software	Quantity Required
1.	Water bath	10
2.	Pilot Curing Chamber (Hot-air Oven)	1
3.	Electronic Balance (0.01g to 300 g)	2
4.	Stirrer	1
5.	Printing screen	6
6.	Printing table	1
7.	Squeegee	1
Total		22

COURSE OUTCOMES:

At the end of the study of this course the students will be able to,

1. Classify and define the fashion, art and design related terms.
2. Describe different types of fashion and life cycles of fashion.
3. Design the elements and principles of the design, with the effects in the apparel.
4. Stretch an account of the various concepts of colour theory and the applications of colours.
5. Develop a theme and prepare a portfolio.

CO/PO, PSO Mapping

(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	1		2						1	3	1	3	3	3	1
CO2	1	1	1					2				3	2	1	
CO3	1		3			2					2	1		3	
CO4	2		3			1	3	2				3	1	2	1
CO5	1	1	2		2			1		1	1	3	1	1	

UNIT I**INTRODUCTION TO FASHION ART DESIGN****9**

Definition: Fashion, Art, Design, Costume and Clothing

Origin and history: Fashion, Art, Design, Clothing and costumes; Importance of Clothing; Types of clothing, Factors to be considered in the selection of clothing.

UNIT II**CLASSIFICATION AND TYPES OF FASHION****9**

Nature of Fashion: Principles of Fashion, Classification of fashion

Movements on Fashion: Fashion cycle, Stages of fashion cycle, Length of fashion cycle business of fashion, theories of Fashion; Fashion trends, Boutique, Haute Couture

Study of leading fashion designers: French, Italian, American, Indian and English, Role of Fashion Designers, Types of designers

UNIT III **ELEMENTS OF DESIGN** **9**

Introduction: Garment Design: structural t design and decorative t design

Elements of design: Line, Size, Shape, Texture, Form, Colour and light - effects of elements in the apparel. Silhouettes, types and their application

Principles of Design: Introduction to principles of designs - Balance, Proportion, Emphasis, Rhythm, Harmony. Illusion effects, Principles on functionality and aesthetics

UNIT IV **COLOUR** **9**

Colour Theories: Primary, secondary, tertiary, intermediate colours

Color Scheme: colour contrast and colour harmony

Dimensions of colours: Hue, Value and intensity, Warm and cool colours, psychology of colours, application of colours to different components and seasons.

UNIT V **PORTFOLIO DEVELOPMENT** **9**

Fashion Illustration: Illustration techniques, strokes, hatching, shading.

Colouring techniques: Media for colouring, Rendering techniques for different fabrics (Plain, Chambrey, Satin, Denim, Velvete, Fur).

Portfolio presentation: Designer boards, Mood board, Fabric board, Colour board, Illustration board, accessory board practicalities and style of presentation,.

Total: 45 Hours

TEXT BOOKS:

1. Marian L Davis, “**Visual Design and Dress**”, Third edition, Prentice Hall, New Jersey, 1996.
2. Elaine Stone, “**Fashion Merchandising – An Introduction**”, McGraw-Hill 5th Edition, 1990.

REFERENCE:

1. Anderson B and Anderson C, “**Costume Design**”, Harcourt Brace Second Edition, 1990.
2. Caroline Tatham and Julian Seaman, “**Fashion Designing and Drawing course**” Thames and Hudson Publishers, 2003.
3. HarroldCarr,”**Fashion Design and Product Development**” John Wiley and Sons Inc. NewYork,1992.
4. Ralph Lauren, “**In His Own Fashion**”, [Alan Flusser](#) 2019.

COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Describe the various pattern making tools in the workroom and the measuring techniques
2. Explain the method of drafting basic body slopers and types of fullness
3. Apply the various types of seams, seam finishes, stitches and sewing threads
4. Draft the pattern drafting and construction procedure for different types sleeves and collars
5. Analyse the types and techniques involved in the construction of garment closures

CO/PO, PSO Mapping

(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	2	3	3	3	3	1				1	1	1	2	3	1
CO2	3	3	3	3	3	1				1	2	1	3	3	1
CO3	1	3	3	3	3		1				2	1	3	3	1
CO4	3	3	3	3	3	1	1			1	2	1	3	3	
CO5	2	3	3	3	3						1	1	3	2	1

Unit -I Measurements and Workroom Practices

8

Flow process chart of garment manufacturing.

Pattern: Definition, Importance, Types: basic pattern, working pattern and production pattern

Pattern making: Definition, Techniques: drafting and draping, Merits and demerits. Pattern making tools and workroom terms and definitions. Types: Industrial and bespoke patterns.

Figure analysis: Head theory: Seven and Half and Eight.

Measuring techniques: Introduction; Standard Measurement charts for male, female and kids, Body measurements: circumference measurement, Vertical measurements and horizontal measurements.

Unit -II Block preparation and Fullness 10

Drafting of basic bodice, Skirt blocks and sleeve

Fullness: Definition types, Darts–single, Double, Pointed darts, Tucks- pin tucks, Cross tucks, Piped tucks, Shell tucks, Pleats,- knife pleats, Box pleats, Invertible box pleats, Kick pleats, Flare, Godets, Gathers, Shirrings, Single and Double frills. **Dart manipulation:** Pivotal method, Slash and spread method, designing with fullness.

Unit III Seams and Stitches 9

Seams: Definition, Federal classification of seams, Seam quality, Seam performance, Factors to be considered in the selection of Seam, Seam finishes.

Stitches: Definition, Federal classification of Stitches, Stitch parameters, Factors to be considered in the selection of stitches.

Sewing thread: Selection of sewing thread for woven and knitted garments.

Unit -IV Sleeves and Collars 10

Sleeves: Drafting and construction of Set–in–sleeves: Plain, Puff, Bell, Circular and Leg-o-mutton; Sleeves combined with bodice: Kimono and Raglan.

Collars: Drafting and construction of Convertible, Shirt, Mandarin, Peter pan, Sailor, Shawl and Notch collar.

Unit V Fasteners 8

Introduction and construction techniques of garment closures: Applications of zippers, Types of button and button holes and their applications, Types and applications of hooks and eye snaps; Velcro, Eyelets, Cords.

Total: 45 hours

TEXT BOOKS:

1. Halen Josep Armstrong “**Pattern Making for Fashion Design**” 5 th Edition, Pretence Hall, New Jercey , 2014.
2. Marie Clayton, “**Ultimate Sewing Bible – A Complete Reference with Step-by-Step Techniques**”, Collins & Brown, London, 2008.
3. Claire Schaeffer, “**The Complete Book of Sewing Shortcuts**”, Sterling Publishing (NY), 2009.

REFERENCE:

1. Winifred Aldrich, “**Pattern Cutting for Menswear**”, 4th edition, Blackwell Science Publisher, USA, 2006.
2. Winifred Aldrich, “**Metric Pattern Cutting**”, Blackwell Publishing, , 2008.
3. Claire Shaeffer, “**Sewing for Apparel Industry**”, Prentice Hall, 2000.
4. Cooklin Gerry, “**Garment Technology for Fashion Designers**”, Blackwell Science Ltd., 1997.
5. Laing, Webster J “**Stitches and Seams**” Woodhead Publishing Ltd., 1998.
6. Leila Aitken, “**Step by Step Dress Making Course**”, BBC Books, 1992.

COURSE OUTCOMES

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

- CO 1** Demonstrate a capacity to work efficiently and with critical engagement with complex and sophisticated primary constitutional law texts
- CO 2** Exhibit the capacity to craft coherent and persuasive constitutional law arguments in an adversarial context ,also recognizing the limitations of such argumentation
- CO 3** Apply a contextual understanding of (i) the function of the High Court as the final arbiter of constitutionality and (ii) the techniques of judicial review as applied
- CO 4** Practice a thorough and contextual knowledge of constitutional law doctrine particularly in its application to real or hypothetical constitutional law problems
- CO 5** Demonstrate a high level of skill on academic and professional legal rights.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
Programme Outcomes (POs) and Programme Specific Outcome (PSOs)															
COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	1	3	3	3	3	3	1	3	3	3	2	3	3	1	1
CO 2	1	3	3	3	3	3	1	3	3	3	1	3	3	1	1
CO 3	1	2	3	3	3	3	1	3	3	2	1	3	3	2	2
CO 4	3	3	2	3	3	1	1	3	3	2	2	3	3	2	3
CO 5	1	3	2	3	3	3	1	3	3	3	2	3	3	3	3

UNIT – I Introduction to Constitution of India

6

- Constitutional law – meaning – importance
- Constitutionalism – features – elements
- Constitution of India – concept – importance – historical perspective – characteristics

UNIT – II Fundamental Rights and Equality

6

- Fundamental rights – scheme – benefits
- Fundamentals duties – importance – and its legal status

UNIT – III Structure, Policies, Principles

6

State policy – the directive principles and its importance-The implementation of directive principles- Parliamentary form of government in India- Constitution power and status of the President- Federal structure and distribution of legislative

UNIT –IV Emergency rule

6

Financial powers between the union and the states- Amendment of the constitutional powers – procedure- Emergency provisions : articles of Indian constitution that has provisions to proclaim emergency- Emergency powers of President – national emergency President rule, financial emergency

UNIT – V Types and Concepts of Local Self Government

6

- The concept of local self –government and its types
- Comparison of the Indian constitutional scheme
- Directive principles of state policy and fundamental duties noted in the Indian constitution
- Scheme of the fundamental rights to certain freedom under Article 19
- Scope of the right to life and personal liberty under Article 21

TOTAL: 30 HOURS

Reference Books

1. The Constitution of India, 1950 (Bare Act), Government Publication.
2. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.
3. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
4. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.

COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Draft and construct samples for basic blocks, seam and seam finishes and fullness.
2. Draft and construct samples for sleeves and collars.
3. Solve real time problem related to pattern making and construction of blocks, seams, fullness, sleeves and collars.

CO/PO, PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	1	1	2		1	1	1			1	1	2	1	1	1
CO2	1	1	2		1	1	1			1	1	1	1	2	1
CO3	1	3	3	1	1	1				2	1	1	1	2	1

List of Experiments**Drafting and construction of following components**

1. **Bodice blocks, Skirt blocks and sleeve block** (2 sessions)
2. **Seam and Seam Finishes** (1 session)
3. **Fullness: Darts, Tucks and Pleats** (1 session)
4. **Sleeves: Plain, Puff and Raglan** (1 session)
5. **Collars: Shirt, Peter pan, Sailor and Shawl** (1 session)

Total: 30 hours

PATTERN MAKING AND GARMENT CONSTRUCTION LABORATORY I

List of equipment required for a batch of 30 students for U.G

S. No.	Name of the equipment / software	Quantity Required	Additional tools issued to individual students
1.	Cork Top Tables	15	L - scale
2.	Dress forms		Hip curve
3.	Male : 40" chest full	1	Meter Scale
4.	Male : 42" chest full	1	French Curve
5.	Male : adjustable half	1	Tracing wheel
6.	Male : 40" chest half	1	Measuring tape
7.	Female : 32.5" bust half	1	Tailor's Chalk
8.	Female : 32.5" bust full	1	Paper cutting scissors
9.	Female : 34.5" bust full	1	Fabric cutting scissors
10.	Female : 36.5" bust full with hand	1	1/4 th Paper Scale
11.	Female : adjustable half	1	
	Mannequins		
12.	i. Baby		
	Boy – 80.5 cm	1	
	Girl – 88.8 cm	1	
	ii. Teenage Girls & Boys		
	Boy – 139 cm	1	
	Girl – 139cm	1	
	iii. Adults		
	Male -186 cm	1	
	Male -182.5 cm	1	
	Female -157.6 cm	1	
	Female -186 cm	1	
	Jewellery bust half head	1	
	Jewellery bust Indian face	1	
	Jewellery hand	2	
13.	Single-needle lock-stitch machine	30	
14.	Steam Iron	3	
15.	Fusing Machine	1	
Total		70	

COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Develop the basic creative and manipulative skills necessary for fashion design through various shading techniques and Sketching various elements and principles of designing and Draw fashion figures and visually communicate apparel design details, understanding of the color theory using various color schemes and Illustrate different styles of garment components and reproduce it to fit fashion figures
2. Illustrate basic fashion figure models and design various fashion designs using software
3. Illustrate different fashion figures incorporating all the illustrating techniques and designing high end fashion garments

CO/PO, PSO Mapping

(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3	3	3	3	2	3	1		1	3	1	3	3	3	2
CO2	2	3	3	3	3	2	1	1	1	3	1	3	3	3	2
CO3	1	2	1	2	2	1			1	1	1	2	2	1	1

LIST OF EXPERIMENTS**Manual Practice**

1. Illustration of lines and strokes using pencil shading techniques; lettering and numbering styles
2. Illustration of human body shapes (Indian and International standards)
3. Illustration of human face
4. Illustration of different postures of human head, hand, leg and feet
5. Illustration of different hair styles
6. Sketching of lay figure using head theory
7. Preparation of Prang's colour wheel
8. Preparation of different colour schemes
9. Rendering different fabric textures

Digital Practice

10. Illustration of sleeves, cuffs, necklines, skirts, pockets, trousers, and skirt tops
11. Illustration of elements and principles of design
12. Draping of garments for men, women and kids on fashion figure
13. Designing of accessories for men, women and kids.
14. Development of flat sketches for men, women and kids.
15. Development of technical pack.

Total: 60 hours

U19FT306 DIGITAL FASHION DESIGN LABORATORY

List of equipment required for a batch of 30 students for U.G

S. No.	Name of the equipment / software	Quantity Required
1.	<i>Open Source software</i>	30
	Hard Ware	
2.	Pentium IV / higher PCs Configuration to Support the Software	30
3.	Printer	1
4.	Scanner	1
	Total	62

**U19ENG301 COMMUNICATION SKILLS LABORATORY
(LAB / PRACTICAL COURSE)**

0 0 2 1

(Common to all branches of Third / Fourth Semester B.E / B.Tech programmes)

Course Outcome: At the end of the course, the students will be able to

- Communicate confidently and effectively
- Demonstrate active listening skills
- Practice soft skills and interpersonal skills to excel in their jobs.
- Use language efficiently to face interviews, participate in group discussions and present speeches.

		CO/PO, PSO Mapping														
		(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
		Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
COs		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		1	3	2	3	3		1	3	3	3	2	3	2	2	3
CO2		1	3	2	3	3	3	3	3	3	3	2	2	2	2	3
CO3		1	3	3	3	3	3	3	3	3	3	2	3	2	3	3
CO4		1	3	2	3	3	3	3	3	3	3	1	3	2	2	3

1. **Listening Comprehension:** Listening and typing – listening and sequencing of sentences – Filling in the blanks – Listening and answering questions.
2. **Reading Comprehension:** Filling in the blanks – Cloze exercises – Vocabulary building – Reading and answering questions.
3. **Speaking: Phonetics:** Intonation – Ear training – Correct Pronunciation – Sound recognition exercises – Common errors in English.
Conversations: Face to Face Conversation – Telephone conversation – Role play activities (Students take on roles and engage in conversation)
4. Making presentations: introducing oneself – introducing a topic – answering questions – individual presentation practice
5. Creating effective PPTs – presenting the visuals effectively
6. Using appropriate body language in professional contexts – gestures, facial expressions, etc.
7. Preparing job applications - writing covering letter and résumé
8. Applying for jobs online - email etiquette
9. Participating in group discussions – understanding group dynamics - brainstorming the topic – mock GD
10. Training in soft skills - persuasive skills – people skills - questioning and clarifying skills
11. Writing Project proposals: collecting, analyzing and interpreting data / drafting the final report
12. Attending job interviews – answering questions confidently
13. Interview etiquette – dress code – body language – mock interview

TOTAL: 30 PERIODS

REFERENCE BOOKS:

1. English and Soft Skills, Dhanavel, S.P. Hyderabad: Orient BlackSwan Ltd. 2010.
2. How to Prepare for Group Discussion and Interview, Corneilssen, Joep. New Delhi: Tata-McGraw-Hill, 2009.
3. Group Discussion and Team Building D'Abreo, Desmond A. Mumbai: Better yourself books, 2004.
4. The ACE of Soft Skills, Ramesh, Gopalswamy, and Mahadevan Ramesh. New Delhi: Pearson, 2010.
5. Corporate Soft Skills, Gulati, Sarvesh. New Delhi: Rupa and Co. 2006.
6. Presentation Skills for Students, Van Emden, Joan, and Lucinda Becker. New York: Palgrave Macmillan, 2004.
7. Dictionary of Common Errors, Turton, N.D and Heaton, J.B. Addison Wesley Longman Ltd., Indian reprint 1998.

EXTENSIVE READING

1. The 7 Habits of Highly Effective People, Covey, Stephen R. New York: Free Press, 1989.
2. The Professional, Bagchi, Subroto. New Delhi: Penguin Books India, 2009.

Semester-III	U19GE301-SOFT SKILLS AND APTITUDE – I	L T P C Marks 0 0 2 1 100
Course Outcomes		
At the end of the course the student will be able to:		
1. Demonstrate capabilities in specific soft-skill areas using hands-on and/or case-study approaches		
2. Solve problems of greater intricacy in stated areas of quantitative aptitude and logical reasoning		
3. Demonstrate good vocabulary skills, analyse comprehension and critical reasoning passages, spot errors and utilize language skills to describe pictures effectively.		
1.Soft Skills	Demonstrating soft-skill capabilities with reference to the following topics:	
	<ul style="list-style-type: none"> a. Attitude building b. Dealing with criticism c. Innovation and creativity d. Problem solving and decision making e. Public speaking f. Group discussions 	
2. Quantitative Aptitude and Logical Reasoning	Solving problems with reference to the following topics:	
	<ul style="list-style-type: none"> a. Vedic Maths: Fast arithmetic, multiplications technique, Criss cross, Base technique, Square root, Cube root, Surds, Indices, Simplification. b. Numbers: Types, Power cycle, Divisibility, Prime factors & multiples, HCF & LCM, Remainder theorem, Unit digit, Tens digit, highest power. c. Averages: Basics of averages and weighted average. d. Percentages: Basics of percentage and Successive percentages. e. Ratio and proportion: Basics of R & P, Alligations, Mixture and Partnership. f. Profit, Loss and Discount: Basic & Advanced PLD g. Data Interpretation: Tables, Bar diagram, Venn diagram, Line graphs, Pie charts, Case lets, Mixed varieties, Network diagram and other forms of data interpretation. h. Syllogism: Six set syllogism using Venn diagram and tick and cross method 	
3. Verbal Aptitude	Demonstrating English language skills with reference to the following topics:	
	<ul style="list-style-type: none"> a. Verbal analogy b. Tenses c. Prepositions d. Reading comprehension e. Choosing correct / incorrect sentences f. Describing pictures g. Error spotting 	



Dr.S.Anita

Head/Training

**Department of Placement Training
Sona College of Technology,
Salem-636 005.**

B. TECH / FASHION TECHNOLOGY

SEMESTER – III	OPERATIONS RESEARCH AND STATISTICAL METHODS	L	T	P	C
UI9MAT301E		3	1	0	4

COURSE OUTCOMES

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

1. solve the linear programming problem using suitable methods.
2. apply the optimization technique to the transportation and assignment problems.
3. analyze project management problems using critical path method and project evaluation and review technique.
4. test the hypothesis for proportions, mean and standard deviation using Z – test.
5. test the significance of the hypothesis using t , χ^2 and F distributions.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3		3								2			3
CO2	3	3		3								2			3
CO3	3	3		3								2			3
CO4	3	3		3								2			3
CO5	3	3		3								2			3

UNIT – I LINEAR PROGRAMMING PROBLEM

12

Linear programming problem - Mathematical formulation – Graphical solution method – Canonical and standard forms of Linear Programming Problem – Simplex method (using slack variables only) – Use of artificial variables – Big-M method.

UNIT – II TRANSPORTATION AND ASSIGNMENT PROBLEMS

12

Transportation problem – Initial basic feasible solution – North west corner rule – Least cost method – Vogel’s approximation method – Modified distribution method – Assignment problem – Hungarian method.

UNIT – III CPM AND PERT

12

Network construction – Critical Path Method (CPM) – Computations of total, free and independent floats – Project Evaluation and Review Technique (PERT) Analysis – Computation of expected time and standard deviation.

UNIT – IV TESTING OF SIGNIFICANCE FOR LARGE SAMPLES

12

Parameter and statistic – Null and alternative hypothesis – Errors in sampling, critical region and level of significance – One tailed and two tailed tests – Testing of hypothesis for proportions, mean, and standard deviation using Z – test.

UNIT – V EXACT SAMPLING DISTRIBUTIONS

12

t -test for single mean, difference between means and paired t -test - χ^2 -tests for independence of attributes, goodness of fit – χ^2 -test for population variance – F -test for variance.

Theory: **45 Hours**

Tutorial: **15 Hours**

Total: **60 Hours**

20. 05. 2020


B. E. / B. Tech. Regulations 2019


TEXT BOOKS:

1. P. K. Gupta and D. S. Hira, "Problems in Operations Research", Sultan Chand and Sons Publishers, 4th Edition, 2015.
2. T. Veerarajan, "Probability, Statistics and Random Processes with Queueing Theory and Queueing Networks", McGraw Hill Publishers, 4th Edition, 7th reprint, 2018.

REFERENCE BOOKS:

1. H. A. Taha, "Operation Research: An Introduction", Pearson Publishers, 10th Edition, 2019.
2. P. K. Gupta and Manmohan, "Problems in Operations Research", Sultan Chand and Sons Publishers, 8th Edition, 2003.
3. S. P. Gupta, "Statistical Methods", Sultan Chand and Sons Publishers, 15th Edition, 2012.
4. S. C. Gupta and V. K. Kapoor, "Fundamentals of Mathematical Statistics", Sultan Chand and Sons Publishers, 11th Edition, Reprint, 2019.
5. R. A. Johnson and C. B. Gupta, "Miller and Freund's, Probability and Statistics for Engineers", Pearson Publishers, 9th Edition, 2018.


Prof. S. JAYABHARATHI
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20. 05. 2020

B. E. / B. Tech. Regulations 2019

U19GE301 - Constitution of India**Course Outcomes****2000**

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

- CO 1** Demonstrate a capacity to work efficiently and with critical engagement with complex and sophisticated primary constitutional law texts
- CO 2** Exhibit the capacity to craft coherent and persuasive constitutional law arguments in an adversarial context, also recognizing the limitations of such argumentation
- CO 3** Apply a contextual understanding of (i) the function of the High Court as the final arbiter of constitutionality and (ii) the techniques of judicial review as applied
- CO 4** Practice a thorough and contextual knowledge of constitutional law doctrine particularly in its application to real or hypothetical constitutional law problems
- CO 5** Demonstrate a high level of skill on academic and professional legal rights.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
COs, POs PSOs Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO - 1	2													
CO - 2	2													
CO - 3	2													
CO - 4	2													
CO - 5	2													

UNIT - I Introduction to Constitution of India

- Constitutional law - meaning - importance
- Constitutionalism - features - elements
- Constitution of India - concept - importance - historical perspective - characteristics

6**UNIT - II Fundamental Rights and Equality**

- Fundamental rights - scheme - benefits
- Fundamentals duties - importance - and its legal status

6**UNIT - III Structure, Policies, Principles**

State policy - the directive principles and its importance - The implementation of directive principles - Parliamentary form of government in India - Constitution power and status of the President - Federal structure and distribution of legislative

6

29.08.2022

B.E. / B.Tech. Regulations 2019

UNIT –IV Emergency rule

Financial powers between the union and the states- Amendment of the constitutional powers – procedure- Emergency provisions : articles of Indian constitution that has provisions to proclaim emergency- Emergency powers of President – national emergency President rule, financial emergency

6

UNIT – V Types and Concepts of Local Self Government

- The concept of local self –government and its types
- Comparison of the Indian constitutional scheme
- Directive principles of state policy and fundamental duties noted in the Indian constitution
- Scheme of the fundamental rights to certain freedom under Article 19
- Scope of the right to life and personal liberty under Article 21

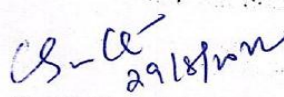
6


Reference Books

1. The Constitution of India, 1950 (Bare Act), Government Publication.
2. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.
3. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
4. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.

Total: 30 hours


29/8/22
Dr. M. Raja
Course Coordinator / Sciences


29/8/22
Dr. C. Shanthi
HOD / Sciences


29/8/22
Dr. M. Renuga
Chairperson BOS,
Science and Humanities

29.08.2022

B.E. / B.Tech. Regulations 2019

Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester IV Regulations 2019
Branch: Fashion Technology

S. No	Course Code	Course Title	Lecture	Tutorial	Practical	Credit	Total Contact Hours
Theory							
1	U19GE402	Mandatory Course: Environment and Climate Science	2	0	0	0	30
2	U19FT401	Pattern Making and Garment Construction - II	3	0	0	3	45
3	U19FT402	Garment Production Machinery and Equipment (Lab Integrated)	3	0	2	4	75
4	U19FT403	Problem Solving using Python Programming (Lab Integrated)	3	0	2	4	75
5	U19FT404	Textile and Apparel Quality Evaluation	3	0	0	3	45
6	U19FT405	Textile Materials for Fashion Design	3	0	0	3	45
Practical							
7	U19FT406	Pattern Making and Garment Construction Laboratory – II	0	0	2	1	30
8	U19FT407	Textile and Apparel Quality Evaluation laboratory	0	0	2	1	30
9	U19GE401	Soft Skills and Aptitude – II	0	0	2	1	30
10	U19FT408	Mini Project - I	0	0	2	1	30
11	U19FT409	In-Plant Training	2 Weeks			1	2 Weeks
Total Credits						22	

Approved By

Chairperson, Fashion Technology BoS
Dr.D.Raja

Member Secretary, Academic Council
Dr.R.Shivakumar

Chairperson, Academic Council & Principal
Dr.S.R.R.Senthil Kumar

Copy to:-

HOD/Fashion Technology, Fourth Semester B.Tech FT Students and Staff, COE

COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Explain the steps in the construction of yokes, necklines and hems
2. Describe stitching methods used for pockets, plackets, waist bands and cuffs
3. Draft block patterns for basic children's, men's and women's garments
4. Explain the basic principles of grading
5. Explain the basic principles of draping

CO/PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	2	3	2	2					3	3	2
CO2	2	3	3	2	3	2	2					3	3	2
CO3	3	2	3	2	3	2	2				2	3	3	2
CO4	3	3	2	2	3	2	2				2	3	2	2
CO5	3	3	3	2	2	2					2	2	2	2

Unit I Yokes, Hemming and Necklines**9**

Yokes: Definition – Selection of yoke design, Different styles of yoke. Simple yoke – yokes with or without fullness – Midriff yokes, Methods of attaching yokes.

Hemming Techniques: Definition, Factors to be considered in the selection of hems, Types of machine stitched hem, Hand stitched hem.

Neckline Finishes: Preparation and uses of True Bias, Facings, and Binding.

Unit II Pockets and Plackets**10**

Plackets: Types, two piece plackets, continuous plackets, Kurtha plackets, Shirt cuff placket

Pockets: Types – patch pocket, patch with lining, Patch with flap, Front hip, Set-in seam, Slash pocket - Single lip, Double lip, with flap.

Waistband: One-piece, Two-piece and Tailor waistband, Elastic applied

Cuffs: Types, square shape, Round shape.

Unit -III Drafting for Garments

10

Drafting: Basic principles and methodologies used to draft block patterns for the following garments: Children's Body Suit, Romper, Frock, Shirt, Trouser, Skirt and Blouse.

Pattern alterations: Importance, Principles and pattern alterations for blouse and trouser.

Unit -IV Grading

8

Grading: Principles of pattern grading, Types: Draft grading: Two dimensional and Three dimensional grading, Track grading; Grading of basic bodice, Basic sleeve and Basic collar.

Unit -V Draping

8

Draping: Introduction, Importance, Preparation of dress forms, Preparation of muslin for draping; draping for bodice, sleeve, collar and skirt.

Total: 45 hours

TEXT BOOKS:

1. Marie Clayton, "**Ultimate Sewing Bible – A Complete Reference with Step-by-Step Techniques**", Collins & Brown, London, 2008.
2. Clair B. Shaeffer "**The Complete Book of Sewing Shortcuts**" Sterling Publishing Company, 1981.

REFERENCE:

1. Claire Shaeffer, "**Sewing for Apparel Industry**", Prentice Hall, 2000.
2. Cooklin Gerry, "**Garment Technology for Fashion Designers**", Kindle edition., 2011.
3. Leila Aitken, "**Step by Step Dress Making Course**", BBC Books, 1992.
4. Peg couch "**Illustrated Guide to Sewing: Garment Construction**", fox chapel publishing, 2011
5. Anette Fischer "**Construction for Fashion Design (Basics Fashion Design)**", Bloomsbury, 2017

(Lab Integrated)

COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Explain different methods of spreading of fabrics with respect to type of fabric.
2. Describe the types and functions of various fabric cutting machines.
3. Explain the functions of primary and auxiliary parts of sewing machine.
4. Elucidate the working principles of over lock and flat lock sewing machine.
5. Explain the functions and working principles of special purpose sewing machines.
6. Identify the major parts and various setting points in garment manufacturing machines.
7. Perform threading sequence of various stitching machines.
8. Determine the causes and remedies for stitch defects

CO/PO, PSO Mapping														
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	3	3	2	2			2	2	3	2	2
CO2	2	3	2	2	2	2		2				3	2	2
CO3	3	3	2	3	2	3					2	3	2	2
CO4	3	1	2	2		2					2	2	3	2
CO5	3	3	2	2	2	3					2	3	3	2
CO6	3	3	3	2	2	2	2				2	2	2	2
CO7	3	3	3	2	2	2	2				2	2	2	2
CO8	3	3	2	3	2	2	2				2	2	3	2

UNIT I Spreading**8**

Spreading: Types of fabrics: One way, two way fabrics, their effect on spreading. Methods of fabric spreading, spreading equipment, computerized spreaders, marker planning, marker efficiency, factors affecting marker efficiency, marker duplicating methods and computer aided marker planning, types of fabric packages.

UNIT II Cutting Machines**8**

Introduction to cutting machines: Types and functions of cutting machines, straight knife, round knife, band knife cutting machines, notches, drills, die cutting machines, computerized cutting machines. Maintenance of cutting machines, common defects in cutting and their remedies.

UNIT III Sewing Machine - SNLS**10**

Basic parts of sewing machine: Primary and auxiliary part and their functions, bobbin case / bobbin hook, throat plate, take up devices, tensioners, feed dog, pressure foot. Types of needle, parts of needle and their function, needle finishes. Adjustments of stand height, pedal, needle bar, stitch length selection, feed timing, needle and bobbin thread tension, stitch cycle timing diagram. Common defects and remedies. Special attachments in sewing machines: guides, folders, stackers, trimmers, ziggers. Different machine brands.

Over lock machines: Types of over lock machines, parts and their functions. Threading diagram of over lock machines. Adjustment of needle height, feed dog height, angle, differential feed ratio, position of upper and lower knives, loopers. Defects and remedies.

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

UNIT V Special Purpose Sewing Machines**9**

Introduction to different special purpose sewing machines: Basic working of feed of arm, button hole sewing, button sewing, bar tack, blind stitch machines. Embroidery sewing machines. **Seam sealing machine.** Latest developments in sewing machines. Sewing machine maintenance, maintenance schedule for various machines.

Total: 75 hours**LIST OF EXERCISES**

1. Identify the single needle lock stitch machine parts, study various setting points, perform threading, prepare samples by using various folders and calculate the SPI for specified/chosen stitch length.(1 sessions)
2. Identify an over lock machine parts, study various setting points, adjustments for needle-thread, looper thread tension, feed-ratio, needle and looper setting and knife setting. perform threading, prepare stitch sample and calculate the SPI for given stitch length. (2 sessions)
3. Identify the flat lock machine parts, study various setting points, making adjustments of the needle-thread and looper-thread tension, feed-ratio, needle-and-looper setting and spreader setting. Perform threading, prepare stitch sample and calculate the SPI for given stitch length. (2 sessions)
4. Identify the button sewing and buttonhole machine parts, study various setting points, perform threading and prepare stitch sample. (2 sessions)
5. Identify the Feed-off arm and Bar tack machine parts, study various setting points, perform threading and prepare stitch sample. (2 sessions)

TEXTBOOKS

1. Carr and Latham's "**Technology of Clothing Manufacture**" Revised by David J.Tyler, Blackwell Publishing, 2008.
2. Laing R.M., Webster J, "**Stitches and Seams**", TheTextile Institute, Manchester, UK, 2009.
3. Rathnamoorthy.,R,Surjith, "Apparel Machinery And Equipments", WoodHead Publishing Indian in Textiles,2015

REFERENCES

1. Shaeffer Claire, "**Sewing for the Apparel Industry**", Prentice Hall, New Jersey, 2001.
2. Singer Sewing Reference Library, "**Sewing Lingerie**", CyDeCosse Incorporated, Minnesota, 1991.
3. Jacob Solinger, "**Apparel Manufacturing Handbook**", Reinhold Publications, 1998.
Garment Production Machinery and Equipment (Lab Integrated)
List of equipment required for a batch of 30 students

S. No.	Name of the equipment / software	Quantity Required
1	Single Needle Lock Stitch Machine	30
2	Over lock machine	3
3	Flat lock machine	2
4	Button sewing machine	1
5	Button Hole machine	1
6	Feed - off the arm machine	1
8	Bar tack sewing machine	1
	Total	39

COURSE OUTCOME:

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

1. Develop algorithmic solutions to simple computational problems
2. Write simple Python programs
3. Write programs with the various control statements and handling strings in Python
4. Develop Python programs using functions and files
5. Analyze a problem and use appropriate data structures to solve it.

CO/PO, PSO Mapping													
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak													
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	PSO1	PSO2
CO1	3	3	3	3									3
CO2	2	3	3	3	3								3
CO3	2	3	3	3	3								3
CO4	2	3	3	3	3								3
CO5	2	3	3	3	3								3

UNIT I Algorithmic Problem Solving**9**

Need for computer languages, Algorithms, building blocks of algorithms (statements, state, control flow, functions), notation (pseudo code, flow chart, programming language), algorithmic problem solving, simple strategies for developing algorithms (iteration, recursion).

UNIT II Basics of Python Programming**9**

Introduction-Python Interpreter-Interactive and script mode -Values and types, variables, operators, expressions, statements, precedence of operators, Multiple assignments, comments, input function, print function, Formatting numbers and strings, implicit/explicit type conversion.

UNIT III Control Statements and Strings**9**

Conditional (if), alternative (if-else), chained conditional (if-elif-else). Iteration-while, for, infinite loop, break, continue, pass, else. Strings-String slices, immutability, string methods and operations.

UNIT IV Functions and Files**9**

Functions - Introduction, inbuilt functions, user defined functions, passing parameters - positional arguments, default arguments, keyword arguments, return values, local scope, global scope and recursion. Files -Text files, reading and writing files.

UNIT V Data Structures: Lists, Sets, Tuples, Dictionaries**9**

Lists-creating lists, list operations, list methods, mutability list functions, searching and sorting, Sets-creating sets, set operations. Tuples-Tuple assignment, Operations on Tuples, lists and tuples, Tuple as return value- Dictionaries-operations and methods, Nested Dictionaries.

Theory: 45 Hours**Tutorial: -****Practical: -****TOTAL: 45 Hours**

TEXT BOOKS:

1. Reema Thareja, "**Problem Solving and Programming with Python**", Oxford University Press, 2018.
2. Allen B. Downey, "**Think Python: How to Think Like a Computer Scientist**", 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers, 2016 (<http://greenteapress.com/wp/think-python/>)

REFERENCES:

1. Ashok Namdev Kamthane, Amit Ashok Kamthane, "**Programming and Problem Solving with Python**", Mc-Graw Hill Education, 2018.
2. Robert Sedgewick, Kevin Wayne, Robert Dondero, "**Introduction to Programming in Python: An Inter-disciplinary Approach**", Pearson India Education Services Pvt. Ltd., 2016.
3. Timothy A. Budd, "**Exploring Python**", Mc-Graw Hill Education (India) Private Ltd., 2015.
4. Kenneth A. Lambert, "**Fundamentals of Python: First Programs**", CENGAGE Learning, 2012.
5. Charles Dierbach, "**Introduction to Computer Science using Python: A Computational Problem Solving Focus**", Wiley India Edition, 2013.

LIST OF EXPERIMENTS

1. Draw flowchart using any open source software.
2. Implement programs with simple language features.
3. Implement various branching statements in python.
4. Implement various looping statements in python.
5. Develop python programs to perform various string operations like concatenation, slicing, indexing.
6. Implement user defined functions using python.
7. Implement recursion using python.
8. Develop python programs to perform operations on list and tuples
9. Implement dictionary and set in python
10. Implement python program to perform file operations.

Theory: -

Tutorial: -

Practical: 30 Hours

TOTAL: 30 Hours

Problem Solving using Python Programming (Lab Integrated)**List of equipment required for a batch of 30 students**

S. No.	Name of the equipment / software	Quantity Required
1	Computers (Pentium i5)	30
Total		30

COURSE OUTCOMES

At the end of the study of the course the student should be able to,

1. Elucidate the various principles and methods are used for yarn properties testing.
2. Describe the different methods and procedure is used for fabric testing properties.
3. Discuss the basic terms and definition of apparel testing and methods of evaluation.
4. Discuss the basic terms and definition and procedures of Quality, Inspection Quality Assurance and Control forms.
5. Elaborate on the quality control for Fabrics, QC in Garment Manufacturing Processes, Quality Standards and Tolerances.

CO/PO, PSO Mapping

(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	3		2		2	2	3	2	2
CO2	3	2	2	2	2	3		2		2	2	3	2	2
CO3	3	2	2	2	2	3		2		2	2	3	2	2
CO4	3	2	2	3	3	3		3		2	2	3	2	2
CO5	3	2	2	3	3	3		3		2	2	3	2	2

UNIT I Fibre and Yarn Testing**9**

Fibre Testing: Testing of cotton using the rapid fibre testing methods, high Volume Instrument (HVI) and AFIS.

Yarn count and Strength: Definitions of count, yarn numbering system, determination of yarn count using wrap reel. **Count Strength Product and single yarn strength.**

Yarn Twist: Definitions of twist, determination of twist of single and ply yarn.

Yarn Evenness and Hairiness: Yarn appearance board winder. Classification of variations in yarn, methods of measuring yarn evenness and hairiness, Uster evenness tester.

Unit II Fabric Testing**9**

Fabric Strength Testing: Fabric tensile strength tester, tearing strength tester, hydraulic bursting strength tester.

Fabric Performance Testing: Martindale abrasion resistance tester. **Fabric pilling:** ICI pillbox tester.

Fabric Drape and Stiffness: Definition of drape and stiffness, drape meter, Shirley stiffness tester, fabric crease resistance and crease recovery tester.

Fabric Permeability: Terms in air permeability and water permeability tester. MVTR, MMT, thermal conductivity and resistance, liquid penetration.

UNIT III **Apparel Testing**

8

Seam Strength: Definition of seam strength, seam puckering, seam slippage and evaluation of interlining quality. Standards for above testing methods.

Apparel testing: Dimensional stability, durable press evaluation, Snap / button pull strength testing. Testing procedures for various functional finishes like anti-microbial, flame retardant.

UNIT IV **Quality, Inspection, Quality Assurance and Control forms**

9

Quality: Introduction, definition, control of quality and its necessity.

Inspection: Importance of inspection, types of inspection: raw material inspection, in-process inspection, final inspection, 100% inspection, sampling inspection, comparison of 100% and sampling inspections. AQL Standards, basic calculations, self-inspection method. definition of minor, major and critical faults.

UNIT V **Quality Control and Quality Standards**

10

QC for fabrics: Quality control for knitted and woven fabrics, types of defects in fabrics, major, minor and critical faults, fabric inspection system, 4 point and 10 point system.

Quality assurance: Definition, differences between quality assurance and inspection, inspection agencies. Control forms.

Quality Standards and Tolerances: Quality standards and tolerances and for fabrics, spreading, cutting, stitching in garment industry, tolerances and quality standards for finished garments. Quality assurance system and standards for packing and packed goods.

TOTAL: 45 hours

TEXT BOOKS:

1. Angappan P and R.Gopalakrishnan , “**Textile Testing**”-S.S.M.I.T.T Co-op stores Ltd.,2007.
2. Koushik C.V. and R. Chandrasekaran, “**Textile Testing**”-NCUTE publication, New Delhi, 2004.
3. Jacob Solinger, “**Apparel Manufacturing Handbook**”, Prentice Hall, New Jersey, 1993.

REFERENCES:

1. J. E. Booth, “**Principles of Textile Testing**”, CBS Publishers and Distributors, New Delhi, 1996.
2. B. P. Saville, “**Physical Testing of Textiles**”, CRC Woodhead Publishing, New Delhi 1999.
3. V.K. Kothari, “**Quality Control and Testing Management**”, IAFL Publications, New Delhi, 1999.
4. Samuel Eilon, “**Production Planning and Control**”, Macmillan, New York, 1962.
5. Grover E. G. and Hamby D. S., “**Hand Book of Textile Testing and Quality Control**”, Wiley Eastern Pvt. Ltd., New Delhi, 1969.
6. Pradip V. Mehta, “**An Introduction to Quality Control for the Apparel Industry**”, Dekker, 1992.

COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Explain about role of textiles in fashion
2. Describe about design features, properties and applications of woven fabrics.
3. Describe about design features, properties and applications of knitted and nonwoven fabrics.
4. Describe about design features, properties and applications of embellished fabrics in fashion
5. Describe about design features, properties and applications of speciality fabrics in fashion

CO/PO, PSO Mapping

(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	2	3		2				2	2	2	3
CO2	3	3	3	3	3	2	2			2	3	2	3	3
CO3	2	2	3	2	3	2						2	2	2
CO4	3	3	3	3	3	2	2			2	2	2	2	2
CO5	3	3	3	3	3	2	2			2	2	2	2	2

UNIT I Role of Textiles in Fashion**9**

Role of textiles in fashion designing, different types of textile materials used in fashion designing: raw material, construction, structure and quality, its properties and application, sources of fabric, choice of fabrics for regular and functional garments, factors influencing the selection of fabric for specific end use.

UNIT II Woven Fabrics in Fashion**9**

Design, properties, applications and commercial names of plain, twill, stain, sateen, crepe, gauze, Bedford cord, leno, pile, gauze, dobby, jacquard, brocade, extra warp, extra weft fabrics and double cloth.

UNIT III Knitted and Nonwoven Fabrics in Fashion**9**

Design, properties, applications and commercial name of jersey, rib, interlock, purl, pique, lacoste weft knitted fabrics.

Design, properties, applications and commercial name full tricot, lock knit, reverse lock knit, satin, shark skin, queen's cord warp knitted fabrics.

Design, properties, applications and commercial name needle punched, melt blown, spun bond nonwoven fabrics.

UNIT IV Embellished Fabrics in Fashion**9**

Design, properties, applications and commercial name of ikkat, bhandhini, batik dyed textiles,

Design, properties, applications and commercial name of batik, stencil, block, screen and transfer printed textiles,

Design, properties, applications and commercial name of kalamkari and spray painted textiles,

Design, properties, applications and commercial name of hand and machine embroidered textiles

Design, properties, applications and commercial name of full grain, bonded, tanned, Suede, embossed leather.

Design, properties, applications and commercial name of coated fabrics for mobility, outdoor & lifestyle, interior design, industrial & protective and exterior application

Design, properties, applications and commercial name of composites, laminated, brushed, lace, stretch, and fur fabrics

TOTAL: 45 hours

TEXTBOOKS:

1. Clive Hallett, Fabric for Fashion: The Complete Guide: Natural and Man-made Fibers Paperback, Laurence King Publishing, 2014
2. Clive Hallett and Amanda Johnston, Fabric for Fashion: A Comprehensive Guide to Natural Fibres, Laurence King Publishing, 2010

REFERENCES:

1. Gail Baugh , The Fashion Designer's Textile Directory: The Creative Use of Fabrics in Design, Thames and Hudson Ltd, 2011
2. Stefanella Sposito , Fabrics in Fashion Design: The Way Successful Fashion Designers Use Fabrics, Promopress, 2017

II

COURSE OUTCOMES

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

1. Draft and construct samples for Placket, Necklines and Pockets.
2. Draft and construct for children's garments like body suit, Romper, Frock and Drape for basic bodice and skirt.
3. Solve real time problem related to pattern making and construction of components, garments and draping

CO/PO, PSO Mapping														
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2	3	2	2				2	3	3	3
CO2	3	2	3	2	3	2	2				2	3	3	3
CO3	3	3	2	3	2	2	2				2	3	2	3

LIST OF EXPERIMENTS**I. Drafting and construction of following components**

1. Plackets – Continuous bound placket, 2 piece placket and Tailored Placket (1session)
2. Necklines – Bias facing, Shaped facing and Bias binding (1session)
3. Pockets –Patch pocket, set in seam pocket and Bound pocket (1 sessions)

II. Drafting and construction of following garments

4. Children's body/sleep suit(1session)
5. Children's rompers(1session)
6. Children's frock(1session)

III. Drape bodice and skirt (1session)

Total: 30 hours

PATTERN MAKING AND GARMENT CONSTRUCTION LABORATORY II

List of equipment required for a batch of 30 students for U.G

S. No.	Name of the equipment / software	Quantity Required	Additional tools issued to individual students
1.	Cork Top Tables	15	L - scale
2.	Dress forms		Hip curve
3.	Male : 40" chest full	1	Meter Scale
4.	Male : 42" chest full	1	French Curve
5.	Male : adjustable half	1	Tracing wheel
6.	Male : 40" chest half	1	Measuring tape
7.	Female : 32.5" bust half	1	Tailor's Chalk
8.	Female : 32.5" bust full	1	Paper cutting scissors
9.	Female : 34.5" bust full	1	Fabric cutting scissors
10.	Female : 36.5" bust full with hand	1	1/4 th Paper Scale
11.	Female : adjustable half	1	
	Mannequins		
12.	i. Baby		
	Boy – 80.5 cm	1	
	Girl – 88.8 cm	1	
	ii. Teenage Girls & Boys		
	Boy – 139 cm	1	
	Girl – 139cm	1	
	iii. Adults		
	Male -186 cm	1	
	Male -182.5 cm	1	
	Female -157.6 cm	1	
	Female -186 cm	1	
	Jewellery bust half head	1	
	Jewellery bust Indian face	1	
	Jewellery hand	2	
13.	Single-needle lock-stitch machine	30	
14.	Steam Iron	3	
15.	Fusing Machine	1	
16	Ironing Table	1	
Total		71	

COURSE OUTCOMES

At the end of study of this course the students will be able to,

1. Determine the count, strength and the appearance of the yarn.
2. Determine the physical and dimensional properties of the fabric.
3. Evaluate the garment qualities like dimensional stability, seam properties of the garment.

CO/PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	3	3	2	2			2	2	3	3	2
CO2	3	3	2	3	3	2	2			2	2	3	3	2
CO3	2	3	2	3	3	2	2			2	2	3	3	2

LIST OF EXPERIMENTS

1. Determination of yarn count, lea strength and CSP. (1 session)
2. Determination of fabric tensile strength and seam strength properties. (1 session)
3. Determination of fabric abrasion resistance and pilling tendency of the fabric. (1 session).
4. Determination of colour fastness to light, washing and rubbing. (1 session)
5. Determination of fabric bursting and tearing strength of the fabric. (1 session)
6. Determination of drape coefficient of fabric by using drape meter. (1 session)
7. Determination of air permeability and wickability of fabric testing. (1 session)
8. Analyse seam puckers and thread consumption for a given garment. (1 Session)
9. Analyse the given fabric and garment defects using standards and suggest causes and remedies. (1 session)
10. Determination of Button Pull Strength and dimensional stability of the garment. (1 session)

Total: 30 hours

TEXTILE AND APPAREL QUALITY EVALUATION LABORATORY**List of equipment required for a batch of 30 students**

S. No.	Name of the equipment / software	Quantity Required
1.	Electronic Balance	1
2.	Automatic Wrap Reel	1
3.	Lea Strength tester	1
4.	Yarn appearance tester	1
5.	Single yarn twist tester	1
6.	Fabric tensile strength tester	1
7.	Double yarn twist tester	1
8.	Martindale abrasion tester	1
9.	Fabric bursting strength tester	1
10.	Fabric stiffness tester	1

11.	Fabric crease recovery tester	1
12.	Drape meter	1
13.	Beesley's Balance	4
14.	Air-permeability tester	1
15.	Course length tester	1
16.	Crimp tester	2
17.	Single yarn strength tester	1
18.	Wash fastness tester	1
19.	Rubbing fastness tester	1
20.	Light fastness tester	1
Total		24

COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Identify case study and innovative ideas related to the subjects learnt in the current semester.
2. Execute a mini project related to the case study and innovative ideas identified by the students.
3. Function effectively on teams and to communicate effectively and develop report with results and conclusion of the mini project work.

CO/PO, PSO Mapping

(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	2	3	3	3	3	3	3	3

The evaluation of mini project shall be conducted in the form of creative methodology as **Hackathon**.

Methodology:

- The students' group shall present their chosen problem statement and justify their selection.
- During review 2, they shall present their solution methodology to the chosen problem statement and also present the requirement.
- During review 3, the group shall present the progress made on the prototype development.
- The office of COE shall give 3 days to conduct the hackathon. During first two days, the students' group shall complete developing their prototype and showcase the same on the third day as video presentation/demonstration of the working model to the team of evaluators.

The evaluation is carried out in the following way:

- The team consist of industry personnel, faculty and peer students. Evaluation metrics and rubrics are provided to each of the evaluators. For computing the final marks, 50% weightage from industry evaluators, 40% weightage from faculty evaluators and 10% weightage from student evaluators, is considered. The numbers of industry evaluators and faculty evaluators for each programme will be decided by the HOD and COE as per the number of teams.
- Industry evaluators are appointed by the office of COE for which the list of such evaluators is provided by the respective departments. The faculty evaluators are also appointed by the office of COE as recommended by the respective HOD. The peer evaluators are chosen by the coordinators as one student from each team.
- Within 5 days after the completion of Hackathona, the students shall submit the mini project report as per the approved guidelines given by the Controller of Examinations.

Total: 30 hours

COURSE OUTCOMES

At the end of the study of this training, the students will be able to

1. Get training in real world of production and process in the apparel and related industries.
2. Understand the entire process in detail.
3. Identify the problems in the industry by observation.
4. Prepare an in-plant training report

CO/PO, PSO Mapping														
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	2		2	2		2	2	2	2	2	2
CO2	2	3	2	3		3	3		2	2	2	2	2	2
CO3	2	3	2	3		3	2		2	2	2	2	2	2
CO4	2	3	3	3					2	3	2	2	2	2

- The students have to undergo a 2-week in-plant training related to the subject learnt in the immediately preceding semesters.
- Industry mentor and institute mentor will be allotted to the students in the inplant training.
- Students have to submit weekly progress report regularly which will be compiled by the institute mentor and submitted to HOD.
- The students have to submit a report of their in-plant training with photos.
- Students have to submit a certificate provided by the industry for two weeks.
- A committee of three staff members as internal examiner and an external examiner will conduct a Viva voce and evaluate student performance.
- Students successfully completing the 2-week in-plant training will be awarded one credit.

Semester – IV	U19GE401-SOFT SKILLS AND APTITUDE – II	L T P C Marks 0 0 2 1 100
Course Outcomes		
At the end of the course the student will be able to:		
1. Demonstrate capabilities in additional soft-skill areas using hands-on and/or case-study approaches		
2. Solve problems of increasing difficulty than those in SSA-I in given areas of quantitative aptitude and logical reasoning and score 65-70% marks in company-specific internal tests		
3. Demonstrate greater than SSA-I level of verbal aptitude skills in English with regard to given topics and score 65-70% marks in company-specific internal tests		
1.Soft Skills	Demonstrating soft-skill capabilities with reference to the following topics: a. SWOT b. Goal setting c. Time management d. Stress management e. Interpersonal skills and Intrapersonal skills f. Presentation skills g. Group discussions	
2. Quantitative Aptitude and Logical Reasoning	Solving problems with reference to the following topics: a. Equations: Basics of equations , Linear, Quadratic Equations of Higher Degree and Problem on ages. b. Logarithms, Inequalities and Modulus c. Sequence and Series: Arithmetic Progression, Geometric Progression, Harmonic Progression, and Special Series. d. Time and Work: Pipes & Cistern and Work Equivalence. e. Time, Speed and Distance: Average Speed, Relative Speed, Boats & Streams, Races and Circular tracks and Escalators. f. Arithmetic and Critical Reasoning: Arrangement, Sequencing, Scheduling, Network Diagram, Binary Logic, and Logical Connection. g. Binary Number System.- Binary to decimal, Octal, Hexadecimal	
3. Verbal Aptitude	Demonstrating English language skills with reference to the following topics: a. Critical reasoning b. Theme detection c. Verbal analogy d. Prepositions e. Articles f. Cloze test g. Company specific aptitude questions	

S. Anita
06/01/2023

Dr.S.Anita

Head/Training
Department of Placement Training
Sona College of Technology,
Salem-636 005.

MANDATORY COURSE

Sona College of Technology, Salem

Department of Sciences (Chemistry)

SEMESTER – IV

MANDATORY COURSE

U19GE402 - ENVIRONMENT AND CLIMATE SCIENCE

(Common for MCT, IT, FT, ECE and BME)

L T P C
2 0 0 0

Course Outcomes:

At the end of the course, the student will be able to

1. state the importance of the acute need for environmental awareness and discuss significant aspects of natural resources like forests, water and food resources.
2. explain the concepts of an ecosystem and provide an overview of biodiversity and its conservation.
3. explain environmental based pollution their causes, effects and their remedial measures
4. discuss their causes, effects and the control measures of Global Warming, Acid Rain, Ozone Layer Depletion
5. describe the effect of climate change due to pollution

UNIT I INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES **6**

Definition, Scope and Importance Forest Resources:- Use and over - exploitation, deforestation, Case Studies, Water Resources:- Use and Over-Utilization of Surface and ground water , Floods, Drought, Food Resources- Effects of Modern Agriculture, Fertilizer- Pesticide Problems–Role of an Individual in Conservation of Natural Resources.

UNIT II ECOSYSTEMS AND BIODIVERSITY **6**

Structure and Function of an Ecosystem– Energy Flow in the Ecosystem -Food Chains, Food Webs and Ecological Pyramids.

Introduction to Biodiversity –Value of Biodiversity: Consumptive Use, Productive Use, Social, Ethical, Aesthetic and Option Values –India as a Mega-Diversity Nation — Threats to Biodiversity: Habitat Loss, Poaching of Wildlife, Man-Wildlife Conflicts – Endangered and Endemic Species of India – Conservation of Biodiversity: In-Situ and Ex-Situ conservation of Biodiversity.

UNIT III ENVIRONMENTAL POLLUTION **6**

Definition – Causes, Effects and Control Measures of:- (A) Air Pollution (B) Water Pollution (C) Soil Pollution (D) Marine Pollution (E) Noise Pollution (F) Thermal Pollution, Solid Waste Management- Effects and Control Measures of Acid Rain,– Role of an Individual in Prevention of Pollution..

23.01.2021

B.E. / B.Tech. Regulations 2019

UNIT IV CLIMATE CHANGE ON THE ENVIRONMENT

6

Sustainable Development- - Climate Change- Causes and effects of Global Warming - Effect of global warming in food supply, plants, sea, coral reef, forest, agriculture, economy - Kyoto Protocol in reduction of greenhouse gases - Ozone Layer Depletion - mechanism, effects and control measures- Montreal Protocol to protect ozone layer depletion - Rain Water Harvesting - .Effect of climate change due to air pollution Case study - CNG vehicles in Delhi

UNIT V EFFECT OF CLIMATE CHANGE ON POLLUTION

6

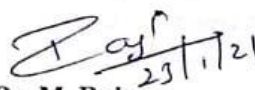
Fungal diseases in forests and agricultural crops due to climatic fluctuations - Growing energy needs - effect of climate change due to non-renewable energy resources. Renewable energy resources in the prevention of climatic changes- Effect of climatic changes in ground water table, garments, monuments, buildings. consumption of energy, agriculture and in electric power sector - Carbon credit - carbon footprint - disaster management -Role of an individual to reduce climate change.

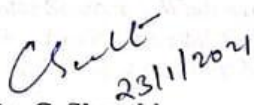
TOTAL: 30 HOURS**Text Books:**

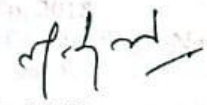
1. Miller, T.G. Jr., "Environmental Science", Wadsworth Pub. Co. 2018
2. Anubha Kaushik and Kaushik, "Environmental Science and Engineering" New Age International Publication, 4th Multicolour Edition, New Delhi, 2014.

References:

1. S. Radjarejesri et al., "Environmental Science" Sonaversity, Sona College of Technology, Salem, 2018.
2. Masters, G.M., "Introduction to Environmental Engineering and Science", Pearson Education Pvt., Ltd., 2nd Edition, 2004.
3. Erach, B., "The Biodiversity of India", Mapin Publishing P.Ltd., Ahmedabad, India.
4. Erach Bharucha, "Textbook of Environmental Studies for Undergraduate Courses", 2005, University Grands Commission, Universities Press India Private Limited, Hyderguda, Hyderabad - 500029.


Dr. M. Raja
 Course Coordinator / Sciences


Dr. C. Shanthi
 HOD / Sciences


Dr. M. Renuga
 Chairperson BOS,
 Science and Humanities

23.01.2021

B.E. / B.Tech. Regulations 2019


F T
V
I

Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester V under Regulations 2019
Branch: Fashion Technology

S. No	Course Code	Course Title	Lecture	Tutorial	Practical	Credit	Total Contact Hours
Theory							
1	U19FT501	Apparel Manufacturing	3	0	0	3	45
2	U19FT502	Apparel Production Planning and Control	3	0	0	3	45
3	U19FT503	Apparel Merchandising (Lab Integrated)	3	0	2	4	75
4	U19FT504	Functional Garments	3	0	0	3	45
5	U19FT904	Professional Elective - Principles of Management	3	0	0	3	45
6	noc23_mg110	NPTEL – Product and Brand Management	3	0	0	3	12 weeks
Practical							
7	U19FT505	Apparel Manufacturing Laboratory	0	0	2	1	30
8	U19FT506	Digital Pattern Development and Marker Planning Laboratory	0	0	2	1	30
9	U19GE501	Soft Skills and Aptitude – III	0	0	2	1	30
10	U19FT507	Mini Project - II	0	0	2	1	30
11	U19FT508	In-Plant Training	2 weeks			1	2 Weeks
Total Credits						24	

Approved By


Chairperson, Fashion Technology BoS
Dr.D.Raja


Member Secretary, Academic Council
Dr.R.Shivakumar


Chairperson, Academic Council & Principal
Dr.S.R.R.Senthil Kumar

Copy to:-

HOD/Fashion Technology, Fifth Semester B.Tech FT Students and Staff, COE

COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Explain the fundamental concepts of measurement for children's garment draft the pattern and construct the garment and enumerate the factors affecting the selection of fabrics, trimmings, seams used in children's wear, explain the method of fabric consumption and check the fit of the garment.
2. Explain the procedure involved in drafting and construction of men's wear, state the method followed in minimizing the fabric used and check the fit of the garment.
3. Draft and construct men's suit and analyse the principles of fit, explain the method to judge the fit of the men's suit'.
4. Analyse the importance and method of taking measurement for women's garment, Design and explain pattern drafting and construction of women's wear and explain the process involved in minimizing fabric consumption for women's wear.
5. Design intimate apparels and check its fitting, explain the procedure involved in drafting and construction of lingerie and state the importance of elastomeric yarns and its application in the manufacture of lingerie.

COs	CO/PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	2	3	1		1				2	3	3	3
CO2	2	3	3	2	3	1		1				3	3	3	3
CO3	2	3	3	3	2	1		1				2	3	3	3
CO4	1	3	3	2	3	1		1				3	3	3	3
CO5	2	3	3	3	2	1		1				2	3	3	3

UNIT I Measurement for Children's Garments

9

Measurement for Children's Garments: Measurement required for construction of children's garments. Step by step procedure for pattern drafting, construction, minimizing fabric consumption and checking the fit for children's wear- body suit, baby frock, shorts, rompers, pedal pushers. Factors affecting selection of fabrics, trimmings, seams used in children's wear.

UNIT II Men's Wear

9

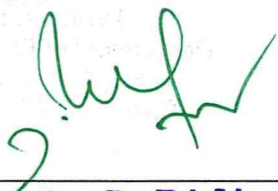
Step by step procedure for pattern drafting, construction and minimizing fabric consumption for men's casual wear, formal wear, work wear and under clothing. Check the fit of the garments.

Casual wear : T-Shirts, Bermudas, Pyjamas, Boxer shorts, Cargos

Formal wear : Formal shirts, Formal trousers

Work wear : Dungarees and overalls

Inner Wear : Vests and briefs



UNIT III Men's Formal Wear

9

Men's Formal Wear: Step by step procedure for pattern drafting: construction and minimizing fabric consumption, principles of fit for men's suits: 2 piece and 3 piece suits, single and double breasted suits.

UNIT IV Women's Wear

9

Women's Wear: Measurement required for construction of women's garments. Step by step procedure for pattern drafting, construction and minimizing fabric consumption for women's wear.

Casual wear : Night wear

Traditional wear : Salwar kameez, Chudidhar

Western wear : Ladies tops, Formal trousers, Skirts: 'A' line, Umbrella, six gore, Circular skirt.

UNIT V Lingerie

9

Lingerie: Intimate apparels, different types of fitting for ladies inner wear, step by step procedure of drafting and construction of stretch fabrics, step by step procedure of construction of brassiers, size and fit, ladies panties, other lingerie's, use of elastomeric yarns in lingerie.

TOTAL: 45 hours

TEXT BOOKS:

1. Patrick John Ireland, "Fashion Design Illustration: Men", B.T Batsford Ltd., London, 1996.
2. Gerry Cooklin, "Pattern Grading for Children's Clothes", Om Book Service, New Delhi, 1991.
3. Harold Carr and Barbara Latham, "The Technology of Clothing Manufacture", Blackwell Science Inc., Oxford, 1994.
4. Singer Sewing Staff, "Sewing Lingerie", CyDeCosse Incorporated, Minnetonka, 1991.

REFERENCE:

1. Singer Sewing Staff, "Sewing Active Wear", Creative Publishing International Editors, 1986.
2. Singer Sewing Staff, "Sewing Pants That Fit", Cowles Creative Publishing Inc., 1989.
3. Gerry Cooklin, "Garment Technology for Fashion Designers", Blackwell Science, Oxford, 1997.


Dr. D. RAJA, M.Tech., Ph.D.,
Professor & Head
Department of Fashion Technology
Sona College of Technology
Salem - 636 005. Tamil Nadu

COURSE OUTCOMES

At the end of the study of the course, the student will be able to,

1. Explain the functions and techniques involved in production and pre-production activities.
2. Describe the lay planning and bundle ticket process in apparel production.
3. Analyse types of production system and operation break down for various garments.
4. Compare the types of capacity, capacity planning and line balancing in cutting, sewing and finishing.
5. Analyse the production planning tools and its implementation in garment industry.

COs	CO/PO, PSO Mapping														
	(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	3	1	1	1	1	1	1	1	1	1	1	3	1	1
CO2	1	3	2	2	1	2	1	1	1		1	1	2	1	1
CO3	1	2	3	2	2	2			1		2		3	2	2
CO4	3	3	1	3	3	2			1		1		2	2	1
CO5	2	2	2	2	1	1			1		3		2	2	2

UNIT I Introduction 9

Production: Definition, Terminology, Functions of production department, Duties and responsibilities of a production manager / supervisor.

Pre-production activities: Lead time, Product development steps from a prototype to the production model, Product data management and detailed interpretation of specification sheets.

UNIT II Lay Planning and Bundle tickets 8

Lay planning: Lay lot planning, numerical exercises on lay lot planning, shrinkage allowance.

Bundle Tickets: Importance and guidelines, sorting and bundling, move ticket, barcode and RFID Technology.

UNIT III Production Systems and Operation Sequence 10

Production systems: Whole garment production system, batch production system, straight line production system, unit production system, quick response production system, modular production system.

Operation breakdown: T- shirt, men's full sleeve shirt, trousers, jeans, ladies night dress, shorts, machines and attachment details.

UNIT IV Capacity Calculation and Line Balancing 9

Types of Capacity: Committed capacity, Available capacity, Potential capacity, Required capacity, Excess capacity.

Capacity calculation: Cutting, sewing and finishing, analysis of man - machine requirements for a given target. Case Study.

Line balancing: Importance, techniques and line balancing matrix, TAKT time analysis. Case Study.

UNIT V Production Planning Tools

9

Principles of scheduling: Scheduling charts, GANTT chart, backlog graph, CPM and PERT analysis.

Line Planning: Multi-style planning, evaluation of plant layout, pitch time analysis, production grid.

Production Monitoring Tools: Daily and monthly production report, Daily and monthly production analysis, Daily and monthly production charts.

TOTAL: 45 hours

TEXT BOOKS:

1. Cooklin Gerry, "**Introduction to Clothing Manufacture**", Blackwell Science Ltd., Oxford, 2006.
2. Ruth E. Glock and Grace I. Kunz, "**Apparel Manufacturing: Sewn Product Analysis**", Fourth Edition, Pearson Education, New Delhi, 2005.

REFERENCE:

1. Chuter A. J., "**Introduction to Clothing Production Management**", Blackwell Science Publishing, 1995.
2. Harold Carr and Barbara Latham, "**The Technology of Clothing Manufacture**", Om Book Service, New Delhi, 1995.
3. Jacob Solinger, "**Apparel Production Handbook**", Van Nostrand Reinhold Publications, New York, 1998.



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COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Describe the apparel merchandising and various types of merchandising
2. Discuss the roles of merchandiser and time management in merchandising
3. Calculate the apparel pricing and sourcing
4. Analyse types of costs and elements of cost
5. Choose appropriate the apparel raw material for end uses and calculate CMT cost
6. Determination of costing for the given garments
7. Perform the merchandising plan for the given work order
8. Development of proto sample for the given specifications

COs	CO/PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	3	3	2	2	2	2	3	2	2	3	3	2
CO2	3	3	3	3	3	1	1		2	3	3	2	3	3	2
CO3	2	3	2	3	2	1	2	1	1	2	2	1	3	2	2
CO4	1	3	3	3	3		2	1	1	2	2	1	3	1	1
CO5	1	3	3	3	3		1			1	3	1	3	3	1
CO6	1	3	3	3	3	1	1	1	3	3	3	3	3	3	3
CO7	1	3	3	3	3	1	1	1	3	3	3	3	3	3	3
CO8	1	3	3	3	3	1	1	1	3	3	3	3	3	3	3

UNIT I Merchandising

9

Apparel Merchandising: Definition, functions of merchandising department, responsibilities of merchandiser. Steps involved in receiving an order, purchase order and specification sheet analysis, sampling procedure, interfacing merchandising with other departments in an apparel organization, terminologies used in merchandising

Types of Merchandising: Principles and techniques of apparel merchandising, retail merchandising, visual merchandising, fashion Merchandising

UNIT II Roles of Merchandiser

9

Roles of Merchandiser: Line planning-Introduction, fashion forecasting, apparel line and seasons. Steps and techniques in fashion forecasting, Market research, consumer research, product research, Fashion research, trend research, colour research, line Development- Fabric and trims selection, prototyping, pre-costing, final product development. Line presentation, Line Adoption, market/customer profiling. Specific roles of buying house, production and retail house merchandisers.

UNIT III Pricing and Sourcing

9

Pricing: Pricing theory, factors affecting price structure in apparel.

Sourcing: Definition, role of merchandiser in sourcing, sourcing process. Need and important factors in sourcing, methods of sourcing raw materials, international and domestic sourcing centers, sourcing of accessories, manufacturing resource planning, sourcing lead time, supplier types, vendor management, JIT technology.

UNIT IV Introduction to Cost accounting 9

Cost: Principles of cost. Types of cost: Fixed cost, Variable cost, Semi variable cost, Conversion cost, Differential cost **Elements of cost,** Direct material cost, Direct expenses, Direct wages - Indirect materials - Indirect expenses, Indirect labour , Overheads, Production overhead , Administrative overhead , Selling and distribution overhead , Components of cost sheet, Break even analysis.

UNIT V Material and CMT Cost 9

Factors that Determine the Price of Garments: Material cost, Cost of yarn, Cost of fabric production, Cost of processing. Factors that affect cost of garment, width, design and lot size. Cutting, Making and Trim cost (CMT cost) for different types of woven and knitted garments - Waste minimisation in garment production.

Total: 75 hours

LIST OF EXERCISES

1. Prepare the Merchandising plan for the given work order.
2. Development of proto sample by using buyer's measurement (specification sheet) and calculate the costing.
3. Determination of CMT costing for the given baby frock
4. Determination of CMT costing for the given men's shirt and trouser
5. Determination of CMT costing for the given T shirt.
6. Determination of CMT costing for the given ladies top and skirt.
7. Prepare the cost sheet and BOM for the given style of garment.

TEXT BOOKS:

1. Moore Evelyn C., "**Path for Merchandising- A Step by Step Approach**", Thames and Hudson Ltd., London, 2001.
2. Vijay Barotia, "**Marketing Management**", Mangal Deep Publication, New Delhi, 2001.
3. **R.Rathinamoorthy, R.Surjit, "Apparel Merchandising"**, Woodhead Publishing Limited, 2019
4. M.Krishnakumar, "**Apparel Merchandising : An Integrated Approach**", Abhishek Publications, 2010

REFERENCE:

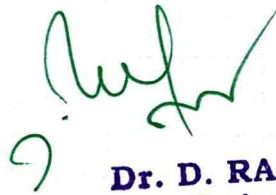
1. Jarnow J. and Dickerson K. G., "**Inside the Fashion Business**", Prentice Hall, New Delhi, 1997.
2. Laine Stone and Jean Samples, "**Fashion Merchandising**", McGraw Hill Books, Singapore, 1985.

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APPAREL MERCHANDISING
(Lab integrated course)

List of equipment required for a batch of 30 students

S. No.	Name of the equipment / software	Quantity Required
1	Single needle Lock Stitch Machine	30
2	Beesley balance	4
3	GSM cutter	2
	Total	36



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COURSE OUTCOMES

At the end of study of this course the students will be able to,

1. Explain the characteristics, classification of functional garments, market size, and functional garments for medical and chemical field.
2. Explain requirements, selection and development of sportswear, and development of camouflage garments.
3. Apply the concept and develop wearable electronics and space suit garments.
4. Analyse the techniques involved in the manufacture of high altitude garments, high visibility garments and chromic textiles.
5. Evaluate the applications, manufacture and its performance of bullet proof vests, cut resistant, vehicle armour clothing and flame resistant textiles.

COs	CO/PO, PSO Mapping														
	(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	3	2	3	2					1	3	2	1
CO2	3	3	3	2	2	3						1	3	3	1
CO3	2	2	2	2	3	2	1					2	2	2	1
CO4	1	3	2	3	1		2					1	2	3	1
CO5	2	3	2	3	1	3	1					3	3	3	2

UNIT I Introduction and Functional Garments for Medical and Chemical field 9

Functional Garments: Introduction, characteristics and classification of functional garments. Size and future growth prospects of world and Indian market of functional garments.

Surgical, intelligent functional and therapeutic clothing: Fibre requirements, characteristics, design and development process of functional garments used for medical application.

Biological and chemical protection clothing: Fibre requirements, design and development process of functional garments used in biological and chemical protection.

UNIT II Sportswear and Camouflage Garments 9

Sportswear: Functional requirements, fibre selection, fabric properties and finishing requirements, ease and comfort, dry-fit garments, importance of moisture management behaviour and applications in sportswear.

Camouflage Textiles: Requirements- fibre and fabric, applications, materials and development process of camouflage clothing for military applications.

UNIT III Wearable Electronics and Garment 9

Wearable Clothing: Principle and design of wearable garments, Requirements of fibre and fabrics, characteristics, flexible wearable electronics in fabrics, wearable sensors, bio monitoring devices. Interfacing circuits and garments. Application of wearable electronics. Design features, comfortness, challenges and limitations of electronics wearable garments. Principle and design of space suit garments.

UNIT IV Garments for Chromic Textiles, High Altitudes and Visibility Garments 9

Textiles: Principles of thermo chromic and photo chromic textiles and outline of manufacturing process. Application of chromic textiles in fashion.

High altitudes garments: Requirements, characteristics, fibres, yarn and fabrics, component materials and development of garments for protection against extreme weather conditions.

High Visibility Clothing: Requirements of fibres, characteristics, applications, materials and manufacturing process of high visibility garments.

UNIT V Defense Clothing 9

Ballistic protection and bullet proof vest: Introduction, concept of ballistic protection, fibres, yarns and fabrics for ballistic protection, manufacture, testing and evaluation of bullet proof vests.

Cut resistant and vehicle armour clothing: Need and requirements, materials, influencing factors, development process, testing and evaluation of cut resistant and vehicle armour clothing,

Flame resistant garments: Requirements, materials, design and development, testing and evaluation of flame resistant garments.

Total: 45 hours

TEXT BOOKS:

1. Horrocks A.R. and Anand S.C., "**Handbook of Technical Textiles**", Wood head Publishing Limited, Cambridge, UK, 2012.
2. Anand S.C., Kennedy J.F., Miraftab M. and Rajendran S., "**Medical Textiles and Biomaterials for Health Care**", Wood head Publishing Limited, Cambridge, UK, 2006.

REFERENCE:

1. Adanur S., "**Wellington Sears Handbook of Industrial Textiles**", Technomic Publishing Co. Inc., 2017
2. Pushpa Bajaj and Sengupta A.K., "**Protective Clothing**", the Textile Institute, 1992.
3. N.Pan and G.Sun., "**Functional Textiles for improved performance, protection and health Part-1 and Part-2**", Wood head Publishing series in textiles, 2011.
4. Mc Cann J. and Bryson D., "**Smart Clothes and Wearable Technology**", Wood Head Publishing Series in Textiles, UK, 2010, ISBN-10: 1845693574
5. Xiaoming Tao, "**Wearable Electronics and Photonics**", The Textile Institute, CRC press, Manchester, 2005
6. Roshan Shishoo, "**Textiles for Sportswear**", Wood head Publishing series in textiles, 2015
7. L.Ashok kumar & C.Vigneswaran, "**Electronics in Textiles and Clothing – Design, Products and Applications**", CRC Press, Coimbatore, 2015


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PROFESSIONAL ELECTIVE

U19FT904

PRINCIPLES OF MANAGEMENT

3003

COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Explain the fundamental concepts and principles of management, including the basic roles, skills, and functions of management along with the knowledge of evolution of management.
2. Explain the role of planning and understand the process of planning which includes setting of objectives, strategies, policies and plans and be familiar with the steps in the forecasting and decision-making process
3. Outline the importance and different forms of organising function, explain different organisational charts stating its authority delegation; Explain the function of staffing which involves managing organization structure through proper and effective selection, appraisal and development of the personnel to fill the roles assigned to the employers/workforce
4. Define leadership and identify traits of effective leaders and describe the behaviours that effective leaders demonstrate; State the need for motivation and the types and theories of motivation; Define communication and understand the communication process and list the barriers to effective communication
5. Explain the process and importance of the controlling function and the various organisational control techniques; Provide an overview of the global business management practices and issues.

COs	CO/PO, PSO Mapping														
	(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	1		3	2					1	2	3	3
CO2	3	3	3	2	3	3	1			2	3	2	3	3	3
CO3	3	3	3	2	3	3	1			2	3	2	3	3	3
CO4	3	3	3	2	3	3	1			2	3	2	3	3	3
CO5	1	3	3	1	3	3	1			1		1	3	3	3

UNIT I Management Concept and Historical Development 9
Nature and Functions of Management: Definition and importance of Management, Management as a Science or an Art, Management and Administration, Levels of management, Functions of Management.
Evolution of Management: Scientific, Human Relations, System and Contingency approaches. Basic forms of business ownership.
Engineers and Organizational Environment: Social, Economic, Technological and Political.

UNIT II Planning and Decision Making 9
Foundations of Planning: Importance of Planning, Steps involved in Planning, Types of plans.
Objectives, strategies and planning: Characteristics and types of objectives, Process of setting Objectives, Strategic planning, SWOT analysis, Significance and types of policies, Steps in policy formulation, Managing by objectives (MBO).

17.07.2022

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Regulations-2019

Forecasting and Decision Making: Characteristic of a good forecast, Classification of forecasting techniques, Problem solving and decision making, Types of decision making, Certainty, Risk, Uncertainty and ambiguity in decision making.

Unit III Organising and Staffing 9

Fundamentals of Organising: Nature and importance of organisation, Steps in organising, Forms of organisation –Line, line and staff, Functional, Group organisations.

Organisation Structure: Formal and informal organizations, Organization Chart – Types, Benefits and Pitfall, Departmentation by difference strategies.

Authority Delegation and De-Centralization: Elements of delegation, Delegation process, Centralisation, Decentralisation, Formalisation.

Staffing: Manpower planning, Employee recruitment, Selection, Training, Performance appraisal, Human Resource Development (HRD) – principles, framework, challenges and benefits.

Unit IV Leadership, Motivation and Communication 9

Leadership styles and theories: Characteristics and functions of leadership, Types of leadership, Leadership styles, Theories, roles of leader.

Motivation: Nature and importance of motivation, Types of motivation, Motivational theories.

Communication: Importance and characteristics, Formal and informal communication, Forms of communication process, Barriers to effective communication, Overcoming the barriers.

Unit V Controlling and Globalisation 9

Controlling: Nature and need for control, Steps in control process, Organisational control techniques – Budgetary control techniques, Management auditing, Information and financial analysis, Break even analysis, Requirements for effective control system.

The Global Environment: Globalisation and Liberalisation, Forms of International business, Benefits of globalisation, MNC, Global theories.

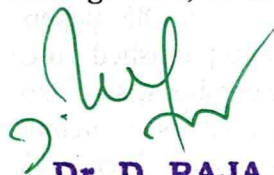
TOTAL: 45 hours

TEXT BOOKS

1. Tripathy P. C. and Reddy P.N., **Principles of Management**, Tata McGraw-Hill, New Delhi, 2010.
2. Charles W.L. Hill, Steven Mcshane, **Principles of Management**, McGraw-Hill/Irwin, Newyork, 2006

REFERENCES

1. David A. DeCenzo, Stephen P. Robbins., **Fundamentals of Human Resource Management**, Wiley publishers, New Delhi, 2009.
2. Harold Koontz, **Essentials of Management**, Tata McGraw-Hill Education, New Delhi, 2012.
3. Joseph L. Massie, **Essentials of Management**, Prentice Hall of India, Pearson Fourth Edition, New Delhi, 2003.



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TYPE OF COURSE: Elective /UG

COURSE DURATION: 12 weeks (24 Jul 23 -13 Oct 23)

CREDITS: 3

EXAM DATE: 29 Oct 2023

Prof. Vinay Sharma
Professor,
IIT Roorkee

PRE-REQUISITE : Basic understanding of Fundamentals of Marketing will be beneficial

INTENDED AUDIENCE : Students of Marketing, Students who wish to learn Marketing and Branding, Executives and Administrators

INDUSTRY SUPPORT : All industries, institutions and even individuals who may think of promoting themselves and their products and services as brands

ABOUT INSTRUCTOR

Vinay Sharma is a Professor with the Department of Management Studies and a Joint Professor with Department of Design at Indian Institute of Technology (IIT) Roorkee, a 175 Years globally known Institution. He has around 28 years of Experience, in the areas of Marketing, Integrated Marketing Communication, Product and Brand Management, Innovation and Design Thinking, Business Opportunity Development, Market Development, Brand Development; IT enabled Services, Spiritual Orientation for Market Prosperity Development, Forest Bio residue-based Energy and Teaching for past Twenty years.

His book publications include 'Stop Predicting - Revisit Life: Lessons from Covid 19', published by Bloomsbury India and released globally, 'Masters Speak; Management Education in India', published by Bloomsbury India and 'Affordability for the Poor and Profitability for the Provider' wherein he has designed and proposed a specialized model acknowledged at various platforms. He has guided 12 PhDs, and a Post-Doctoral Research and 8 PhDs are being pursued. He has considerable experience of working with various organizations in the fields of Media, Information Technology and Social Development along with having worked with one of the largest read newspapers. Vinay Sharma has been teaching Marketing, Strategy and the allied subjects, at various prestigious institutions. He has contributed an Appendix on Rural Marketing in the 13th edition of Philip Kotler's Principles of Marketing.

He has published and presented around 85 papers, Chaired sessions at National and International platforms, developed and published 16 case studies based on primary research and has conducted more than 100 workshops, seminars, FDPs and MDPs also for CEOs and MDs along with senior executives. He is a member of the Editorial Board of several prestigious journals and is also a member of academic and advisory councils and Board of Management of prestigious institutions and bodies. He has also been a working group member of Ganga River Basin Environment Management Plan, a Pan IIT project.

The present course titled “Innovation, Business Models and Entrepreneurship” has been running for several years with around 30,000 registrations in total.

COURSE LAYOUT

Syllabus

Week 1: Introduction to Product Management

Week 2: Product Planning

Week 3: Product Category Analysis

Week 4: Insight, Innovation and Design Thinking

Week 5: New Product development

Week 6: Brand and Brand Management

Week 7: Brand Equity and Value chain

Week 8: Brand Valuation and Brand Loyalty

Week 9: Brand Life cycles and Organizational Designs


Week 10: Brand Architecture

Week 11: Brand Equity Measurement

Week 12: Ethics and Spirituality for Product and Brand Management

Books and references

1. Donald, R.L., & Russell S.W. (2002). Product Management (3rd Ed.). Tata McGraw Hill
2. Keller, K.L., & Swaminathan, V. (2019). Strategic Brand Management: Building, Measuring and Managing Brand Equity (5th Ed.). Prentice Hall
3. Trott, P. (2008). Innovation Management and New Product Development (4th Ed.). Prentice Hall
4. Kapferer, J. (2012). The New Strategic Brand Management: Advanced Insights and Strategic Thinking (5th Ed.). Kogan Page
5. Reis, A., & Trout, J. (2001). Positioning: The Battle for Your Mind. McGraw Hill Education



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COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Explain the method of taking measurements for men's wear and describe the process involved in pattern making and the construction.
2. Design women's wear and method of taking measurements for women's wear and describe the process involved in pattern making and the construction.
3. Analyse the construction sequence of men's wear and women's wear for any given measurement.

COs	CO/PO, PSO Mapping														
	(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	3	3	1				2		2	3	2	1
CO2	2	3	3	3	3	1				2		2	3	2	1
CO3	1	3	3	3	2	1				1		1	3	3	3

LIST OF EXPERIMENTS**Construction of****Men's casual wear:**

1. Men's Bermudas (1 session)
2. Men's T-Shirt (1 session)

Men's inner garments:

3. Briefs and vests (1 session)

Men's formal wear

4. Men's formal shirt (1 sessions)
5. Men's formal trousers (1 sessions)

Women's casual wear

6. Ladies Salwar and Kameez (1 session)
7. Ladies Chudidhar (1 session)
8. Ladies Night Dress (1 sessions)

Women's traditional wear

9. Ladies Sari Blouse (1 sessions)

Women's western wear

10. Ladies Top and Skirt (1 session)

Women's lingerie

11. Ladies Brassiere and Panties (1 session)

TOTAL: 30 hours

APPAREL MANUFACTURING LABORATORY

List of equipment required for a batch of 30 students for U.G

S. No.	Name of the equipment / software	Quantity Required	Additional tools issued to individual students
1.	Cork Top Tables	15	L - scale
2.	Dress forms		Hip curve
3.	Male : 40"chest full	1	Meter Scale
4.	Male : 42"chest full	1	French Curve
5.	Male : adjustable half	1	Tracing wheel
6.	Male : 40"chest half	1	Measuring tape
7.	Female : 32.5" bust half	1	Tailor's Chalk
8.	Female : 32.5" bust full	1	Paper cutting scissors
9.	Female : 34.5" bust full	1	Fabric cutting scissors
10.	Female : 36.5" bust full with hand	1	1/4 th Paper Scale
11.	Female : adjustable half	1	
	Mannequins		
12.	i. Baby		
	Boy - 80.5 cm	1	
	Girl - 88.8 cm	1	
	ii. Teenage Girls & Boys		
	Boy - 139 cm	1	
	Girl - 139cm	1	
	iii. Adults		
	Male -186 cm	1	
	Male -182.5 cm	1	
	Female -157.6 cm	1	
	Female -186 cm	1	
	Jewellery bust half head	1	
	Jewellery bust Indian face	1	
	Jewellery hand	2	
13.	Single-needle lock-stitch machine	30	
14.	Steam Iron	3	
15.	Fusing Machine	1	
Total		70	

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COURSE OUTCOMES

At the end of the study of this course, the students will be able to,

1. Create fashion drawings for children's, ladies and men's garments using a computer and related software
2. Draft the patterns, grade and generate marker plan
3. Develop fashion drawings for patterns, grade and generate marker plan for the given wear

COs	CO/PO, PSO Mapping														
	(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	1	3							3	3	3	2
CO2	2	1	1	1	3							3	3	3	2
CO3	2	1	1	1	3							3	3	3	2

1. Practice of pattern making and grading software features. (2 sessions)
2. (i) Development of design, pattern and pattern grade for children's frock.
(ii) Preparation of marker plan.
(iii) Calculation of marker efficiency for one-way fabric of varying fabric width.
(1session)
3. (i) Development of design, pattern and pattern grade for children's body suit.
(ii) Preparation of marker plan.
(iii) Calculation of marker efficiency for one-way fabric of varying fabric width.
(1session)
4. (i) Development of design, pattern and pattern grade for baby romper.
(ii) Preparation of marker plan.
(iii) Calculation of marker efficiency for two-way fabric of 38" and 42" width.
(1session)
5. (i) Development of design, pattern and pattern grade for ladies top,
(ii) Preparation of marker plan.
(iii) Calculation of marker efficiency for plaid fabric of 44" and 52" width. (1session)
6. (i) Development of design, pattern and pattern grade for ladies party wear.
(ii) Preparation of marker plan.
(iii) Calculation of marker efficiency for plaid fabric of 44" and 52" width. (1session)
7. (i) Development of design, pattern and pattern grade for ladies skirt.
(ii) Preparation of marker plan.
(iii) Calculation of marker efficiency for corduroy fabric of 38" and 60" width and develop a lay lot plan. (1session)

8. (i) Development of design, pattern and pattern grade for men's full-sleeve shirt.
(ii) Preparation of marker plan for checked fabric of 52" and 60" width.
(iii) Calculation of marker efficiency and development of lay lot plan. (1session)
9. (i) Development of design, pattern and pattern grade for men's formal trousers.
(ii) Preparation of marker plan for pencil stripe fabric of 60" and 72" width.
(iii) Calculation of marker efficiency and development of lay lot plan. (1session)
10. (i) Development of design, pattern and pattern grade for men's formal shorts.
(ii) Preparation of marker plan for pencil stripe fabric of 60" and 72" width.
(iii) Calculation of marker efficiency and development of lay lot plan. (1session)

TOTAL: 30 hours



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**DIGITAL PATTERN DEVELOPMENT AND MARKER PLANNING
LABORATORY**

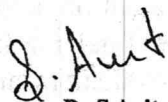
List of equipment required for a batch of 30- students

S. No.	Name of the equipment / software	Quantity Required
1.	Computers-Pentium IV	30
2.	Scanner	1
3.	Printer	1
4.	Pattern Drafting, Grading and Marker Planning Software -Tuka CAD	1
5.	Pattern Drafting, Grading, Marker Planning and 3D Designing Software -Lectra software	30
Total		63



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Professor & Head
Department of Fashion Technology
Sona College of Technology
Salem - 636 005. Tamil Nadu

Semester -V	U19GE501 : SOFT SKILLS AND APTITUDE - III	L	T	P	C	Marks
		0	0	2	1	100
Course Outcomes						
At the end of the course the student will be able to:						
1. Demonstrate capabilities in supplementary areas of soft-skills and job-related selection processes using hands-on and/or case-study approaches						
2. Solve problems of advanced levels than those in SSA-II in specified areas of quantitative aptitude and logical reasoning and score 70-75% marks in company-specific internal tests						
3. Display effective language knowledge to construct sentences with subject verb agreement and select the best alternative for the underlined parts of the sentences, and fill in the blanks in the given passages with suitable forms of words and their synonyms.						
1.SOFT SKILLS	Demonstrating soft-skill capabilities with reference to the following topics: a. Career planning b. Resume writing c. Group discussion d. Teamwork e. Leadership skills f. Interview skills g. Mock interviews h. Mock GDs					
2.QUANTITATIVE APTITUDE AND LOGICAL REASONING	Solving problems with reference to the following topics : a. Geometry: 2D, 3D, Coordinate Geometry, and Height & Distance. b. Permutation&Combinations: Principles of counting, Circular Arrangements and Derangements. c. Probability: Addition & Multiplication Theorems, Conditional Probability and Bayes Theorem. d. Statistics : Mean Median, Mode, Range and Standard Deviation. e. Interest Calculation : Simple Interest and Compound Interest f. Crypto arithmetic: Addition and Multiplication based problem. g. Logical Reasoning : Blood Relations, Directions Test, Series, Odd man out, Analogy, Coding & Decoding, Problems and Input – Output Reasoning. h. Statement & Assumptions, Statements & Arguments, Inference. i. Company Specific Pattern : Infosys and TCS company specific problems					
3. VERBAL APTITUDE	Demonstrating English language skills with reference to the following topics: a. Subject verb agreement b. Selecting the best alternative for the stated parts of given sentences c. Reading comprehension d. Contextual synonyms e. Sentence fillers f. Writing a story for a given picture g. Company specific aptitude questions					



Dr.S.Anita

Head/Training

**Department of Placement Training
Sona College of Technology,
Salem-636 005.**



Dr. D. RAJA, M.Tech., Ph.D.,

**Professor & Head
Department of Fashion Technology
Sona College of Technology
Salem - 636 005. Tamil Nadu**

COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Identify case study and innovative ideas related to the subjects learnt in the current semester.
2. Execute a mini project related to the case study and innovative ideas identified by the students.
3. Function effectively on teams and to communicate effectively and Develop report with results and conclusion of the mini project work.

COs	CO/PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3
CO3	3	3	3	3	3	3	2	3	3	3	3	2	3	3	3

The evaluation of mini project shall be conducted in the form of creative methodology as **Hackathon**.

Methodology:

- The students' group shall present their chosen problem statement and justify their selection.
- During review 2, they shall present their solution methodology to the chosen problem statement and also present the requirement.
- During review 3, the group shall present the progress made on the prototype development.
- The office of COE shall give 3 days to conduct the hackathon. During first two days, the students' group shall complete developing their prototype and showcase the same on the third day as video presentation/demonstration of the working model to the team of evaluators.

The evaluation is carried out in the following way:

- The team consist of industry personnel, faculty and peer students. Evaluation metrics and rubrics are provided to each of the evaluators. For computing the final marks, 50% weightage from industry evaluators, 40% weightage from faculty evaluators and 10% weightage from student evaluators, is considered. The numbers of industry evaluators and faculty evaluators for each programme will be decided by the HOD and COE as per the number of teams.
- Industry evaluators are appointed by the office of COE for which the list of such evaluators is provided by the respective departments. The faculty evaluators are also appointed by the office of COE as recommended by the respective HOD. The peer evaluators are chosen by the coordinators as one student from each team.
- Within 5 days after the completion of Hackathaoon, the students shall submit the miniproject report as per the approved guidelines given by the Controller of Examinations.

TOTAL: 30 hours

17.07.2022

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Regulations-2019

COURSE OUTCOMES

At the end of the study of this training, the students will be able to

1. Get training in real world of production and process in the apparel and related industries.
2. Analyse the entire process in detail.
3. Identify the problems in the industry by observation and attempt to give solution and prepare an in-plant training report

COs	CO/PO, PSO Mapping														
	(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	3	2	2		2	2		2	2	1	1	2	2	2
CO2	1	3	1	3		3	3		2	1	1	1	2	2	2
CO3	1	3	1	3		3	1		1	1	1	1	2	2	2

- The students have to undergo a 2-week in-plant training related to the subject learnt in the immediately preceding semesters.
- 3 internal reviews shall be done by a committee duly appointed by the HOD.
- Students shall submit a report on the work done during the course duration which consists of the following:
 - Description of the work
 - feedback from the respective industry mentor
 - Photographs of the students in the industry if the work is undertaken there.
 - Completion certificate from the Industry
- The final viva voce shall be conducted by a committee duly appointed by the office of COE which consists of a person from the related industry, two faculty members –
 1. From the same department
 2. From another related department.
- The evaluation is 100% internal.


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V. Jem

Semester –V	U19GE501 : SOFT SKILLS AND APTITUDE - III	L	T	P	C	Marks
		0	0	2	1	100
Course Outcomes						
At the end of the course the student will be able to:						
1. Demonstrate capabilities in supplementary areas of soft-skills and job-related selection processes using hands-on and/or case-study approaches						
2. Solve problems of advanced levels than those in SSA-II in specified areas of quantitative aptitude and logical reasoning and score 70-75% marks in company-specific internal tests						
3. Display effective language knowledge to construct sentences with subject verb agreement and select the best alternative for the underlined parts of the sentences, and fill in the blanks in the given passages with suitable forms of words and their synonyms.						
1.SOFT SKILLS	Demonstrating soft-skill capabilities with reference to the following topics: <ol style="list-style-type: none"> Career planning Resume writing Group discussion Teamwork Leadership skills Interview skills Mock interviews Mock GDs 					
2.QUANTITATIVE APTITUDE AND LOGICAL REASONING	Solving problems with reference to the following topics : <ol style="list-style-type: none"> Geometry: 2D, 3D, Coordinate Geometry, and Height & Distance. Permutation&Combinations:Principles of counting, Circular Arrangements and Derangements. Probability: Addition & Multiplication Theorems, Conditional Probability and Bayes Theorem. Statistics : Mean Median, Mode, Range and Standard Deviation. Interest Calculation :Simple Interest and Compound Interest Crypto arithmetic: Addition and Multiplication based problem. Logical Reasoning :Blood Relations, Directions Test, Series, Odd man out, Analogy, Coding & Decoding, Problems and Input – Output Reasoning. Statement & Assumptions, Statements & Arguments, Inference. Company Specific Pattern :Infosys and TCS company specific problems 					
3. VERBAL APTITUDE	Demonstrating English language skills with reference to the following topics: <ol style="list-style-type: none"> Subject verb agreement Selecting the best alternative for the stated parts of given sentences Reading comprehension Contextual synonyms Sentence fillers Writing a story for a given picture Company specific aptitude questions 					

S. Anita
8/6/2023

Dr.S.Anita

Head/Training

Dr. S. ANITA

Professor and Head

Department of Training,

SONA COLLEGE OF TECHNOLOGY,

SALEM-636 005.

Syllabi for

**B.E/B.Tech Honours (Specialization in the
same Discipline)**

B.E/B.Tech Honours

B.E/B.Tech Minor

courses

U19FT2019

SOURCING AND VENDOR MANAGEMENT

3003

COURSE OUTCOMES**At the end of the course, the students should be able to,**

1. State the scope and methods of purchase and sourcing.
2. Explain the strategies in sourcing process.
3. Explain the cross functional approach to sourcing.
4. Apply vendor management and production planning techniques.
5. Analyse the vendor selection and management.

CO/PO, PSO Mapping														
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1			2			3						2		3
CO2			3		3	3					2	3		1
CO3			3		3	3						3		2
CO4			3		3	3					2	3		2
CO5	2		3	2	3	3					2	3		2

UNIT I PURCHASING AND SOURCING

9

Introduction, definition and scope of purchasing, evolution of purchasing and sourcing, purchasing objectives, impact of strategic purchasing on profitability, make or buy decisions, types and methods of sourcing in retail, centralized vs decentralized, single sourcing vs multiple sourcing, day-to-day vs long range sourcing.

UNIT II SOURCING PROCESS

9

Market analysis and supplier research, prime sources of supplier information, request for proposal, fundamental steps of buying process, terms and condition of purchase, buying documentation, negotiation, use of IT in sourcing, global tenders and E-procurement, reverse auctions, expanded role of global purchasing.

UNIT III CROSS FUNCTIONAL APPROACH TO SOURCING

9

Overview of material management function and supply chain alignment, role of purchasing in supporting inventory objectives, goals of inventory control, hedging vs. forward buying, risk management, matching supply with customer demand, managing inward logistics, transportation modes and warehousing.

legal, socio-cultural issues in international buying, dealing with international suppliers, UNO and GATT conventions environmental issues-green purchasing.

UNIT IV VENDOR MANAGEMENT AND PRODUCTION PLANNING

9

Introduction to vendor management, importance of vendor management in the apparel industry, overview of vendor management process. vendor selection and evaluation, vendor sourcing strategies, vendor evaluation criteria and methods, supplier relationship management, role of vendor management in supply chain optimization.

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production monitoring and timely delivery, time action chart, production forecasting and demand planning, its importance, benefits, and tools used, types of production forecasting: short-term, medium-term, long-term, techniques for demand forecasting: qualitative and quantitative, time series analysis for demand forecasting.

UNIT V **VENDOR SELECTION AND MANAGEMENT**

9

New vendor development process, working with suppliers to manage quality, jit and tqm in sourcing, key supplier account management, vendor relationship development, vendor monitoring, promoting SME suppliers.

vendor contracts and negotiations, elements of a vendor contract, negotiation strategies and techniques, terms and conditions in apparel vendor contracts.

ethical considerations in vendor management, ethical sourcing and responsible supply chain practices, vendor compliance and social responsibility audits, managing ethical challenges and promoting transparency

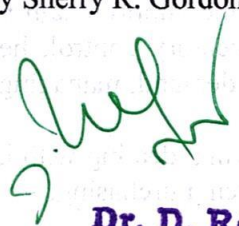
Total: 45 Hours ✓

TEXT BOOKS

1. **"Purchasing and Supply Chain Management"** by Kenneth Lyons and Brian Farrington (2016)
2. **"Strategic Sourcing in the New Economy: Harnessing the Potential of Sourcing Business Models for Modern Procurement"** by Bonnie Keith and Kate Vitasek (2016)

REFERENCE BOOKS

1. **"Supplier Relationship Management: Unlocking the Hidden Value in Your Supply Base"** by Christian Schuh, Michael F. Strohmer, and Stephen Easton (2014)
2. **"Purchasing and Supply Management: A Balanced Approach"** by P. Fraser Johnson, Michiel R. Leenders, Anna E. Flynn (2014)
3. **"Strategic Sourcing and Category Management: Lessons Learned at IKEA"** by Magnus Carlsson and Håkan Håkansson (2013)
4. **"The Procurement and Supply Manager's Desk Reference"** by Fred Sollish and John Semanik (2012)
5. **"Supplier Evaluation and Performance Excellence: A Guide to Meaningful Metrics and Successful Results"** by Sherry R. Gordon (2011)



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COURSE OUTCOMES

At the end of the course, the students should be able to,

1. State concepts on sampling.
2. Explain the design interpretation process in sampling.
3. Describe about techniques on fabric preparation and sample development.
4. Analyse the sample approval and quality control processes.
5. Analyse sampling process and industry practices.

CO/PO, PSO Mapping														
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2		3						2		3	
CO2	3	3	2	3	3					2	3		3	
CO3		3	2	3	3						3		2	
CO4		3		3	3					2	3		2	
CO5	2	3	2	3	3					2	3		2	

UNIT I SAMPLING CONCEPTS**9**

Definition and importance of apparel sampling, Overview of apparel sampling process, roles and responsibilities of sampling department. Types of Apparel Samples - prototype samples, fit samples, production samples, sales samples, size set samples, their importance and roles in apparel industry, challenges in sampling process, Virtual Sampling Process.

UNIT II DESIGN INTERPRETATION**9**

Technical Specifications and design interpretation, identifying key elements, translating design concepts into technical specifications, interpretation of design concepts and client requirements, creation and analysis of technical specification sheets: sketches, measurements, construction details, fabric and trims details.

UNIT III FABRIC PREPARATION AND SAMPLE DEVELOPMENT**9**

Fabric Selection and Preparation- Fabric types, properties, and suitability for different garments - Fabric sourcing and testing, preparing fabric for cutting and sample sewing. Pattern Making and grading for Sample Development, Sewing techniques, seam finishes, and finishing for Sample Development, fit check and pattern adjustments, Finishing and pressing techniques for garment samples

UNIT IV SAMPLE APPROVAL AND QUALITY CONTROL**9**

Importance of sample approval, sample approval workflow, communication of sample approvals, documentation and maintenance of sample approval records, quality control in sample production- importance of quality control in the sampling process, identifying and rectifying sewing and construction defects, evaluating samples for accuracy, precision, and adherence to technical specifications.

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UNIT V SAMPLING PROCESS AND INDUSTRY PRACTICES

9

Collaboration in the Sampling Process, Effective communication with designers, pattern makers, and client, collaborating with cross-functional teams involved in sample development, Managing timelines, workflow and quality in the sampling process, advancements in apparel sample development, incorporating sustainability and ethical considerations in the sampling process.

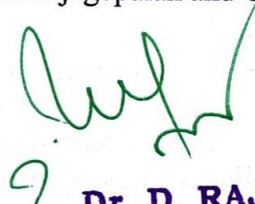
Total: 45 Hours ✓

TEXT BOOKS

1. **Statistics for Business and Economics** (15th ed.). Gupta, S.P., & Gupta, M.P. Sultan Chand & Sons. ISBN 978-8180548105. (2019).
2. **Apparel sampling: testing, evaluation, and quality management** by Rajkishore Nayak and Rajiv Padhye (2016).
3. **"Research Methodology: Methods and Techniques"** by C.R. Kothari (2013)

REFERENCE BOOKS

1. **Sampling in Fashion Design"** by Meenakshi Narula and Poonam Narula (2017)
2. **Sampling Techniques for Fashion Designers** by Arul Daniel and Kavita Thomas (2014).
3. **Apparel Production and Quality Management** by S. B. Mandal and N. Mandal (2012)
4. **Apparel Production Management and the Technical Package** by Pamela J. Peers (2014)
5. **Business Research Methods** by S.S. Rajagopalan and G. Vijayalakshmi (2015)



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COURSE OUTCOMES

At the end of the course, the students should be able to,

1. Describe the introduction to high fashion design and its key concepts
2. Explain the sewing techniques of high fashion garment
3. Explain the types of high fashion styling
4. Conceptualize the different types professional and celebrity styling
5. Plan of fashion styling

COs	CO/PO, PSO Mapping														
	(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1		2	3		3							2	2	3	2
CO2			3		3				3	3		3	2	3	2
CO3		3		3	3					3	3	3	3	3	3
CO4			3		3				3	3		3	2	3	2
CO5		3		3	3					3	3	3	3	3	3

UNIT I HIGH FASHION DESIGN

6

Overview of high fashion and its significance in the fashion industry, Historical context and evolution of high fashion, key concepts and terminology in high fashion designing, role of high fashion designers and their impact on the industry, fashion houses and their contributions to high fashion, Trends in high fashion styling

UNIT II HIGH FASHION GARMENT DESIGNING AND CONSTRUCTION

6

Principles of high fashion garment designing, pattern making and construction, Techniques for creating unique silhouettes and intricate details, haute couture and its craftsmanship, couture sewing techniques and embellishments, quality control and fitting processes.

UNIT III HIGH FASHION STYLING

6

Introduction, Types of Styling, Commercial Styling, Vintage Clothing, runway styling, Street Style, styling to suit various fashion genres, accessories in high fashion styling, concept of creating signature style as a high fashion stylist, create unique and avant-garde looks for artistic and theatrical projects

UNIT IV FASHION STYLING TECHNIQUES

6

Conceptualizing and developing a high fashion style, color theory, fabrics, textures, and materials and its application in high fashion styling, Customization, Visual Merchandising, creating signature style as a high fashion stylist, Model casting, styling, and choreography, Professional Photo Shoots, Professional Protocols & Etiquette

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UNIT V FASHION BUSINESS AND GLOBAL LUXURY MARKET

6

High fashion and luxury brands, Brand positioning and marketing strategies, Retailing and distribution channels, promotional activities, Fashion Blogging, Fashion Feature Writing, Art Direction

LIST OF EXERCISES

1. Design and prepare men and women couture garments
2. Design and prepare a personal/celebrity styling based on a theme for a client
3. Prepare styling for a professional photoshoot
4. Prepare styling for a vintage type photoshoot
5. Prepare styling for industry level professional photo shoots

Theory: 30 Hours

Tutorial: -

Practical: 30 Hours

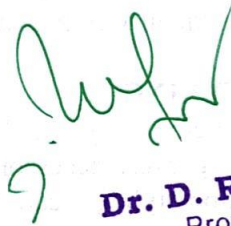
TOTAL: 60 Hours ✓

TEXT BOOKS

1. Jacqueline Mc, Assey, Sophie Benson, Clare Buckley, "Fashion Styling", Bloomsbury Academic, ISBN: 9781350074101, 1350074101, March 2022.
2. Somer Flaherty, "Book of Styling", Lerner Publishing Group ISBN:9781936976423, 1936976420, 2012

REFERENCES

1. Sasha Charnin Morrison, "Secrets of Stylists", An Insider's Guide to Styling the Stars, ISBN:9781452105772, 1452105774, Chronicle Books LLC 2011
2. Danielle Griffiths, "Fashion Stylist's Handbook", Quercus Publishing, ISBN:9781786271143, 1786271141, August 2012
3. Jo Dingemans, "Mastering Fashion Styling", Macmillan Education UK, ISBN:9781349150519, 1349150517, 1999



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At the end of study of the course the students should be able to,

1. Explain about fashion styling, factors involved and sources of styling.
2. Describe the importance of personal styling and its requirements.
3. Describe the role of editorial and catalogue styling and its process for product promotion.
4. Elaborate the show styling, its necessities, requirements and its process for company promotion.
5. Describe about commercial styling, theatre styling and brand promotion, process in creating new brand identities.

COs	CO/PO, PSO Mapping														
	(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	2	2		3				2	3	3	2	2
CO2	2	3	3	3	1	3				2	2	2	3	3	2
CO3	2	3	3	3	3	3	3				2	2	3	3	3
CO4	2	3	3	3	3	3	3			2	2	3	3	3	3
CO5	3	3	3	3	3	3	3				2	2	3	3	3

UNIT-I Fashion Styling

9

Introduction to styling, fashion system and fashion marketing, , principles of art, design and trend forecasting for creative fashion styling, various sources of fashion styling, expectations of international luxury, fashion and publishing industries, photography and fashion magazine in styling, opportunities for stylist, studies on body challenges.

UNIT -II Personal Styling

9

Introduction and its importance, body shape and personality, garment style vocabularies, Elements of makeover, wardrobe edit, styling for personal, celebrities, stage performance and special occasions, types of makeover, hair styles and accessories, photo shoot for different occasions, types of garments that need to be avoided.

UNIT -III Editorial and Catalogue styling

9

Introduction, essentials of editorial and catalogues, Role of designer, freelance stylists, photographers and models, choice of theme, colour, dress and make up for styling, role of visual communication and graphic design in the fashion styling, process of producing photo shoots from initial idea stage to final image editing, Digital and online media – fashion websites, blogs, social media.

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UNIT - IV Show styling

9

Introduction, Necessities of events and fashion parades, types of shows, choice of models, garments, accessories, music, lighting and location, developing the event concept, Role of media, photographers, and promotional companies in show styling.

UNIT -V Commercial styling

9

Introduction, Choice of styling models or celebrities for commercials advertisement, selecting the wardrobe items, choice of location, models, makeup artists and photographer for the shoot, process involved in creating new brand identities, new markets and consumers. Brand photograph, Character styling, Sourcing and overview of theater styling.

TOTAL: 45 Hours ✓

TEXT BOOKS

1. Griffiths, D. (2012). **Fashion Stylist's Handbook**. Hachette UK.
2. Dingemans, J. (1999). **Mastering fashion styling**. Macmillan International Higher Education.

REFERENCES

1. Devlin, P. **Vogue Book of fashion photography** (London: Thames and Hudson, 1979)
2. Simon, M. **Fashion in art. The Second Empire and Impressionism** (London: Zwemmer, 1995)
3. Williams, V. (ed) **Look at me. Fashion and photography** in Britain 1960 to the present (London: British Council, 1998)

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Sona College of Technology, Salem
(An Autonomous Institution)
Courses of Study for B.E/B.Tech. Semester VI Regulations 2019
Branch: Fashion Technology

S. No	Course Code	Course Title	Lecture	Tutorial	Practical	Credit	Total Contact Hours
Theory							
1	U19FT601	Clothing Size, Fit and Comfort	3	0	0	3	45
2	U19FT602	Fashion Visual Merchandising	3	0	0	3	45
3	U19FT603	Industrial Engineering in Garment Production	3	0	0	3	45
4	U19FT911	Professional Elective - Fashion Forecasting	3	0	0	3	45
	U19FT912	Professional Elective - Value Engineering in the Apparel Industry					
5	U19FT917	Professional Elective - Advances in Garment Production	3	0	0	3	45
	U19FT919	Professional Elective - Fashion Retail Store Operations					
6	U19BM1001	Open Elective - Hospital Management	3	0	0	3	45
	U19CE1002	Open Elective - Municipal Solid Waste Management					
	U19CE1003	Open Elective - Energy Efficiency and Green Building					
	U19CS1001	Open Elective - Big Data Analytics					
	U19CS1003	Open Elective - Internet of Things					
	U19EC1006	Open Elective - Mobile Technology and its Applications					
	U19EE1002	Open Elective - Energy Conservation and Management					
	U19EE1003	Open Elective - Innovation, IPR and Entrepreneurship Development					
	U19EE1004	Open Elective - Renewable Energy Systems					
	U19ME1002	Open Elective - Industrial Safety					
U19ME1004	Open Elective - Renewable Energy Sources						

Practical							
7	U19FT604 ✓	3D Virtual Fit analysis Laboratory	0	0	2	1	30 ✓
8	U19FT605 ✓	Industrial Engineering in Garment Production Laboratory	0	0	2	1	30 ✓
9	U19GE601 ✓	Soft Skills and Aptitude – IV	0	0	2	1	30 ✓
10	U19FT606 ✓	Mini Project - III	0	0	2	1	30 ✓
Total Credits						22 ✓	

26/12

Approved By

[Signature]
 Chairperson, Fashion Technology BoS
 Dr.D.Raja

[Signature]
 Member Secretary, Academic Council
 Dr.R.Shivakumar

[Signature]
 Chairperson, Academic Council & Principal
 Dr.S.R.R.Senthil Kumar

Copy to:-

HOD/Fashion Technology, Sixth Semester B.Tech FT Students and Staff, COE

COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Define anthropometry and sizing system. Explain the principles of sizing systems and also categorise the sizes for men, women and children wear.
2. Discuss about the subjective evaluation and objective evaluation of clothing fit.
3. Discuss the importance of clothing comfort and properties related to tailoring performance.
4. Elaborate the points to be kept in mind while judging physiological comfort and fitting of textile products.
5. Explain the influence of thermal comfort on selection of fabrics.

CO/PO, PSO Mapping

(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	PSO1	PSO2	PSO3
CO1	2	1	1	3	3	3	3	3	3	3	3	3	2	2
CO2	2	3	3	3	3	3	3	3	3	3	2	3	3	2
CO3	1	3	3	3	3	3	3	3	3	3	3	3	3	3
CO4	1	2	3	3	2	3	3	3	3	3	1	3	2	2
CO5	1	3	1	2	3	3	3	3	3	3	1	3	3	2

UNIT I Anthropometrics and Sizing Systems

9

Basics of sizing systems: Definition, anthropometric analysis, tools used, body shape analysis, classification of body shapes, characteristic differences among figures, posture – types, figure types- vertical, horizontal, key measurements, Overcoming unrealistic body image. Basic Statistics for size standardisation:

UNIT II Sizing Systems and Size Standardisation

9

Sizing systems- strength and weakness, Need of sizing survey Process of sizing system- importance, Direct and Indirect ways of human body measurement, brief on advance technology such as 3-D Body scanning, undertaking the national sizing, size and shape surveys, anthropometric analysis, size analysis, key or control measurements, Sizing survey methodology, statistics used in sizing system - Measures of Central Tendency, Measures of Dispersion, Percentiles, and Normal Distribution Curve.

Apparel size designation and labelling. survey Study of International sizing system: UK, US and Europe. Size categories in men's, women's and children's wear. Study of protocols such as ISO 8559, ISO 7250, ISO 15535, and ISO 20685

UNIT III Evaluation of Clothing Fit

9

Fit -Definition, Importance, standards, influences of clothing fit, Methods of testing fit- fit models, fitting futures, measured methods, pinned pattern / tissue methods, trial garment, guide to fitting problems. Alternative methods for evaluating fit-using structural line, grain line, wrinkles, pinch test, inside measurement. Evaluating fit: subjective, objective, rating scales, subjective fitting guide, Objective method-moiré optics, algebraic evaluation of clothing fit, clothing waveform, pressure evaluation of clothing fit , 3D modeling of pressure fit, 3D visualization, 3 D fitting evaluation and pattern alteration using cloth and garment simulation tools - virtual try.

UNIT- IV Clothing Comfort

9

Comfort: Introduction to clothing comfort, types and definition, human clothing system, comfort perception and preferences, Need and selection of clothing, Components of clothing comfort, Clothing Comfort and

wearer's attitude, clothing performance characteristics: comfort, durability, hand and tailor ability, Fabric properties related to tailoring performance.

UNIT V Physiological and Thermal Comfort

9

Physiological Comfort: Concept related to physiological aspects of clothing comfort, factors affecting garment fit and comfort – air gap thickness, garment ventilation, fluctuating microclimate in loose-fit garment, garment fit and pressure sensation. Fabric properties related to fit, perspiration, tactile, fabric expansion and relaxation.

Thermal Comfort: Physical phenomena affecting thermal comfort, Effect of fabric properties on heat transfer, Moisture vapour permeability, Liquid moisture permeability and air permeability.

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Total: 45 hours

TEXT BOOKS

1. Fan J., Yu .W and Hunter L., “**Clothing Appearance and Fit**”, Textile Institute, Woodhead Publishing Limited, England, 2004.
2. Das .A and Alagiruamy .E, “**Science in clothing comfort**”– Wood head Publishing Ltd., 2010.
3. “**The Perfect Fit: Classic Guide to Alter Patterns**”, Creative Publishing International, USA, 2005.
4. Das A and Alagirusamy , “**Science in clothing comfort**”, Wood head publishing limited, England 2010.

REFERENCE

1. Sandra Betzina, “**Fast Fit-Easy Pattern Alterations for Every Figure**”, The Taunton Press Inc., Singapore, 2003.
2. Zakaria, Norsaadah, and Deepti Gupta, eds. “**Anthropometry, apparel sizing and design**”. Woodhead Publishing, 2019.
3. Faust, Marie-Eve, and Serge Carrier, eds. “**Designing apparel for consumers: The impact of body shape and size**”. Woodhead Publishing, 2014.
4. Gill, Simeon. “**Sizing in Clothing: Developing Effective Sizing Systems for Ready-to-wear Clothing**.” Journal of Fashion Marketing and Management: An International Journal (2008).
5. ISO 20685 – 1: 2018 - International standard for 3D scanning methodologies for international compatible anthropometric data bases for protocol for 3-D.
6. ISO 20685-2:2015(E) - Evaluation protocol of surface shape and repeatability of relative landmark position.
7. ISO 8559-1:2017 Size designation of clothes- Anthropometric definitions for body measurement.
8. ISO 7250-1:2017 Basic human body measurements for technological design -Part 1: Body measurement definitions and landmarks.
9. ISO 15535:2012(E) General requirements for establishing anthropometric databases.

RELATED JOURNALS:

1. **Journal of Textile & Apparel Technology and Management**, North Carolina, USA **International Journal**.
2. **Stitch World** - Industry magazine. (stitchworld.net).
3. **Apparel Views** magazine. (www.apparelviews.com)

COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Define the significance and role of visual merchandising in a retail environment, in order to effectively present the merchandise to the consumers.
2. Classify the various elements of visual presentation and understand their significance in visually presenting a display.
3. Analyze and identify the best suitable environment for merchandise including interior and point of displays.
4. Determine the type of fixtures and mannequins for different display arrangements
5. Develop planogram and merchandise assortment planning and acquire knowledge on the various computer applications in visual merchandising.

CO/PO, PSO Mapping

(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	PSO1	PSO2	PSO3
CO1	1	3	1	2	3				2	0	0	2	3	2
CO2	2	2	2	3	2							2	2	2
CO3	1	1	2		3							2	2	2
CO4	2	2			2							2	2	2
CO5	2	2	2		2				1	3	2	2	2	2

UNIT I Fundamentals of Visual Merchandising

9

Definition, objectives and scope, types of display and display settings, retail stores and approaches of visual merchandising, types of retail stores, store atmospherics, approaches in visual merchandising in various stores, department store approach and small store approach. Role of Visual Merchandising in the changing face of retailing.

UNIT II Elements of Visual Presentation

9

Introduction - Overview of the various elements, importance of store exteriors and interiors arrangements, Store front – Façade, Signs, Marquees, Outdoor lighting, Banners, Planters, Awnings, Windows and its types. Masking and proscenia, Store layout-Objectives, allocation of space, types of layouts, Utilization of store space – staircase, lifts, elevators, point of purchase display. Store line composition, Signage and graphics – need, types of signage, sign sizes, sign colors. Signage changes and updates.

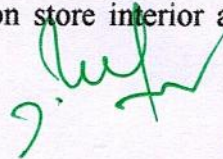
PRACTICE: Development of miniature fashion retail store front using various types of visual merchandising elements.

UNIT III Store interiors, Points of Display and Display Techniques

10

Store interior-display types and settings. Interior components – Store atmosphere, lighting, sound track and its selection, scent, ceiling, focal points, island displays, risers and platforms, the runway, counters and display cases, museum cases, demonstration cubes, ledges, shadow boxes, enclosed displays, fascia, t-walls. Point of purchase display, industrial display, fashion shows, attention getting devices, familiar symbols. Application and selection of colour, colour schemes and colour psychology to create mood in garment display.

PRACTICE: Development of miniature fashion store interior atmosphere using various types of visual merchandising elements.



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UNIT IV Mannequins and Fixtures

8

Mannequins – purpose and applications, types of mannequins, alternatives of mannequins and other human forms, Fixtures-Role of fixtures, types of fixtures, criteria for selection of fixtures, dressing fixtures, modular fixtures. Sourcing of Properties-buy, rent or build.

PRACTICE: Development of miniature merchandise displays using mannequins and fixtures.

UNIT V Merchandise Planning and computer aids in visual merchandising

9

Planogram-Definition, design and direction of flow. Floor plans and reading of floor plans, purpose of planning. Merchandise assortment planning – Price, Styles, Sizes and Colors, optimize apparel assortments, display calendar and planning a display, scheduling the promotion, budgeting and safety factors in visual merchandising.

Introduction-Softwares used for store design and merchandise arrangement planning, inventory management. Recent computer technologies used in visual merchandising

PRACTICE: Development of sample planogram and merchandise assortment planning for given store particulars.

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TOTAL: 45 Hours

TEXT BOOKS

1. Pegler M.M., “**Visual Merchandising and Display**”, IV Edition, Fair child Publications, New York, 2001.
2. Diamond. J. Diamond. E., “**Contemporary Visual Merchandising**”, Prentice Hall Inc. New Jersey 2003.
3. Diamond.E, “**Fashion Retailing - A Multi-channel Approach**”, II Edition, Prentice Hall Inc., New Jersey 2006.

REFERENCE

1. Rath P.M., Peterson J., Greensley. P, Gill. P, “**Introduction to Fashion Merchandising**”, Delmar Publishers Inc., New York 1994.
2. Phillips P.M., “**Fashion Sales Promotion**”, II Edition, Prentice Hall Inc, New Jersey, 1996.
3. Curtis E, “**Fashion Retail**”, John Wiley and Sons Ltd, England, 2004.

COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Explain the importance of productivity and discuss the role of industrial engineer in the garment industry.
2. Discuss the various procedure and techniques involved in method study.
3. Explain the objectives and procedure to measure work content in the garment industry and also discuss its importance.
4. Explain the importance of plant layout, standardisation techniques and analyse the lean manufacturing technology in the garment industry.
5. Discuss the various planning, control tools and material handling systems used in garment industries.

CO/PO, PSO Mapping

(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	PSO1	PSO2	PSO3
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CO2	3	3	3	3	3	2	3	2			1	3	2	2
CO3	3	2	2	2	3	2	2	2				2	2	2
CO4	3	2	3	1	3	2	2				1	2	3	2
CO5	3	2	3	2	3	3	3					3	2	2

UNIT I Industrial Engineering Basics

9

Productivity: Production, Productivity, types of productivity, productivity measures, factors affecting productivity in garment industry, measurement of line efficiency.

Industrial engineering: Definition, Need of Industrial Engineering, Benefits, Roles and responsibilities of industrial engineer in apparel industry

IE in Ergonomics and Safe working environment: right and wrong postures, Manufacturing environment in RMG sector: Light, Noise, Vibration, Colour, Temperature and Ventilation and its Standards

UNIT II Method Study

9

Method study: Definition, Objectives, Basic procedure, Value Added and Non Value Added activity analysis, Method improvement techniques

Process Chart: Flow process chart, multiple activity chart, Case studies and application of process chart in garment industries.

Motion Economy: Principles of motion economy, classification of movements, micro-motion study, factors of ergonomics in motion study

UNIT III Work Measurement

9

Work Measurement: Definition, Objective, Techniques

Time study: Operation Breakdown and its importance, definition of time study, steps in making time study, breaking the job into elements, stop-watch procedure, different pre-determined motion time study (PMTS) techniques, Work sampling Technique

Standard Time: Types of rating factor, Types of allowances: Personal, Fatigue, Machine, Delay and Policy allowances, mechanism of arriving SAM, SMV and SAM examples for regular garments. Latest work measurement techniques – RFID and IoT.

UNIT IV Plant Layout

9

Layout: Objectives, Steps in planning layout, Types of layout, importance of Plant location, Work area planning, quick changeover, application of robotics in automated sewing production systems.

22.12.2023

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Regulations-2019

Standardisation: Standard operating procedure, Risk analysis during proto-type development, ROI on standardisation techniques.

Lean Manufacturing: Definition, objective, concepts and principles, SMED technique.

UNIT V Planning and Control

9

Planning: Cost per minute, learning curve, preparation of operation bulletin, development of skill matrix, thread consumption, estimation of on-standard and off-standard time.

Line Balancing: WIP, factors influence on line balancing techniques, pitch diagram analysis.

Material Handling: Definition, objective, classification of material handling equipment in apparel industries.

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TOTAL: 45 hours

TEXTBOOKS

1. Jana, P., & Tiwari, M. (2018). **"Industrial Engineering in Apparel Manufacturing"**. New Delhi, India: Apparel Resources Pvt. Ltd. (ISBN: 9788193247204)
2. Khan M.I **"Industrial Engineering"**, New Age International, 2007.

REFERENCE

1. Cooklin Gerry, **"Introduction to Clothing Manufacture"**, Blackwell Science Ltd., 2006.
2. Johnson Maurice **"Introduction of Work Study"**, International labour Organization, Geneva, 2010.
3. Ralph M Barnes, **"Motion and Time study design and measurement of work"**, John Willey sons Inc. 2002., New York
4. Bridger, **"Introduction to Ergonomics"**, Tata McGraw Hill, 1995

PROFESSIONAL ELECTIVE

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FASHION FORECASTING

3 0 0 3

COURSE OUTCOMES

At the end of the study of this course, the students will be able to,

1. Define and discuss the fashion forecasting, types of forecasting and compilation of forecasting information.
2. Explain the forecasting packages, role of forecasters in aiding designers and the various processes involved in it.
3. Explain the forecasting procedure, the role and method of forecasting.
4. Explain the Colour Forecasting process and the tool kits used to predict the direction
5. Explain the colour cycles and colour relationship in the forecasting process

CO/PO, PSO Mapping

(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	PSO1	PSO2	PSO3
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CO2	2	3	3	3	3	2	2	2	2	3	1	3	3	3
CO3	2	3	3	2	3	2	2		2	3	2	3	3	3
CO4	2	3	3	3	2	2				3	2	3	3	3
CO5	2	2	2	1	1					2	2	2	2	2

UNIT I Fashion Forecasting

9

Fashion Forecasting: Definition of forecasting, types of forecasting, source of Fashion forecasting information, forecasting agencies and their role in forecasting. Seasons and their impact on fashion. Compiling fashion forecasting information, forecasting agencies, forecasting magazines, websites and information in the forecasting publications.

UNIT II Role of Forecasting Agencies

9

Role of Forecasting Agencies: Fashion forecasting packages and magazines. Specialist fashion forecasting companies: WGSN, promostyl. Role of forecaster in aiding fashion designers, developers and retailers, process of forecasting, decision making process, when to start forecasting for the selling season.

UNIT III Colour, Style and Fabric Forecasting

9

Colour, Style and Fabric Forecasting: driving forces of fashion, The views of the forecasters and trend information users, knowledge of colour, style and fabric, forecasting process, forecaster's toolkit, development of story Predicting the direction for colour, style and fabric forecast, Market study-review of market performance, Fashion Triangle of Balance.

UNIT IV Forecasting Procedure

9

Forecasting Procedure: Endogenous and Exogenous variables in forecasting, Source of forecasting data, collection of data, categorising under different theme for different styles, fabric, colour and accessories for different seasons. Method of adopting forecasted data in domestic, International and Regional markets. Method of forecasting for industries.

UNIT V Trend Analysis on accessories

9

development of story predicting the direction for accessories forecast, design jewelry, bags, belts, scarves, hats, footwear, eyewear based on forecasted trend analysis

22.12.2023

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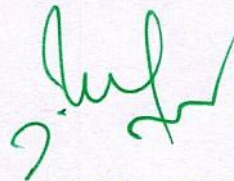
Regulations-2019

TEXT BOOKS

1. Kathryn McKelvey and Janine Munslow, "**Fashion Forecasting**", Wiley , Blackwell, USA, 2008
2. Seivewright Simon, "**Basics Fashion Design -Research and Design**", Bloomsbury Publication India, 2012.

REFERENCE

1. Susan Dillon, "**The Fundamentals of Fashion Management**", AVA Publishing (UK) LTD., 2012.
2. Lorynn Divita, **Fashion Forecasting**, Fairchild, 2019.
3. Chelsea Rousso and Nancy Kaplan Ostroff, **Fashion Forward**, Fairchild, 2018
4. Evelyn L. Brannon & Lorynn R. Divita, **Fashion forecasting**, Fairchild books, 2015
5. Eundeok kim & Ann marie fiore, **Fashion Trends: Analysis and Forecasting**, Berg publications, 2011
6. Tracy Diane and Tom Cassidy, **Color forecasting**, John wiley and sons, 2009
7. Chelsea Rousso, "**Fashion Forward - A Guide to Fashion Forecasting**", Bloomsbury Academic, 2012.



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COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Explain the concept of engineering economics and the various costs involved and economic analysis based on the product and process design.
2. Discuss the importance and functions of value engineering and value analysis for a manufacturing concern.
3. Discuss the various production tools of increasing productivity in apparel industry.
4. Explain work study and various waste reduction techniques for efficient production.
5. Explain the importance and application of material management and inventory control systems.

CO/PO, PSO Mapping

(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

Programme Outcomes (POs) and Programme Specific Outcome (PSOs)

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
CO1	3	2	3	2	3	3	3	1			1	1	3	1	1
CO2	3	2	3	1	2	3	2	1					2	3	1
CO3	3	2	3	2	3	3	2	1					3	3	2
CO4	3	2	3	2	3	3	2	1					3	2	1
CO5	3	2	3	1	2	2	1	1			2	2	2	3	1

UNIT I Introduction to Economics

9

Introduction to Economics: Introduction to Economics, flow in an economy, law of supply and demand, concept of engineering economics, engineering efficiency, economic efficiency, scope of engineering economics, types of costs, , marginal cost, marginal revenue, sunk cost, opportunity cost, P/V ratio, elementary economic analysis.

UNIT II Value Analysis

9

Make or Buy Decision: Criteria for make or buy decision, approaches for make or buy decision, simple cost analysis, economic analysis, break even analysis.

Value Analysis: Introduction, function, objective, value analysis and value engineering, value engineering procedure, advantages and applications of value engineering.

UNIT III Production Tools on Value Engineering

9

Production and Productivity: Difference between production and productivity, productivity in reducing garment cost, different productivity methods, systematic approach to improve productivity.

Line balancing: Importance of line balancing, line layout and plant layout, working environment, ergonomics and material handling to improve productivity.

Inventory: Reducing inventory costs, JIT inventory management and importance of sourcing at competitive rates.

UNIT IV Manufacturing Cost Control

9

Work Study: Importance of work study in reducing garment cost, setting standard time, reducing wastage of material, efficient pattern making, efficient marker planning.

Sewing: Reduction of sewing thread wastage during sewing, contribution of seam and hem allowances in cost reduction, importance of reducing machine idle time.

Cost control: Work force management, power management, material/waste management.

Identification of all costs (avoidable and unavoidable) associated with garment manufacturing and the way to reduce costs through Innovative approaches.

UNIT-V Materials Management and Inventory Control Systems

9

Materials management: Management Resources Planning (MRP), just in time production system (JIT), optimised production technology (OPT), economic order quantity (EOQ).

Inventory control: Various inventory modelling, case studies related to apparel industry.

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TOTAL: 45 hours

TEXTBOOKS

1. PanneerSelvam, R., "**Engineering Economics**", Prentice Hall of India Ltd, New Delhi, 2012.
2. Johnson Maurice and Moore E., "**Apparel Product Development**", Om Book Service, 2001.

REFERENCE

1. Johnson Maurice, "**Introduction of Work Study**", International labour Organization, Geneva, 1995.
2. Jacob Solinger, "**Apparel Manufacturing Hand Book**", Reinhold Co, 1998.
3. Chan S. Park, "**Contemporary Engineering Economics**", Prentice Hall of India, 2002.
4. Donald G Newman and Jerome P Lavelle, "**Engineering Economics and Analysis**" Engg. Press, Texas, 2002

PROFESSIONAL ELECTIVE

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ADVANCES IN GARMENT PRODUCTION

3 0 0 3

COURSE OUTCOMES

1. Explain the automation in fabric inspection, spreading and cutting.
2. Emphasis on the technological advances in sewing.
3. Describe the automation in material handling
4. Understanding about robotics in apparel manufacturing process.
5. Understanding the latest technology in seamless garments.

COs	CO/PO, PSO Mapping														
	(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	2	3	3	1			3		2	3	2
CO2	3	3	3	3	3	2	3	1			3	1	3	2	2
CO3	3	2	2	2	3	2	2	1					2	2	2
CO4	3	2	3	1	3	2	2					1	2	3	2
CO5	3	2	3	2	3	3	3						3	2	2

UNIT I Automation in Fabric Inspection, Spreading and Cutting 9

Definition – importance and role of automation in apparel industry. Principles of automatic fabric inspection and defect checking. Machine vision system – image acquisition, Image segmentation. Automated elements in spreading machines. Latest developments in cutting: water jet, laser and plasma cutting.

UNIT II Technological Advances in Sewing and finishing 9

Introduction, development of the industrial sewing machine, advances in sewing needle design, advances in sewing thread technology, advances in sewing machine automation, semi-automated equipment, machines using computer numerical control. Advances in finishing equipment: pressing with pressure and without pressure.

UNIT III Automation in Material Handling 9

Types of equipment- Automated storage and retrieval systems- Overview of conceptions of “Work Robots” and “Manipulators”. Conveyor systems – Overhead transport systems. Ply separation; Transportation - position and orientation, pick and place – clamping grippers and pinch grippers

UNIT IV Robotics in Apparel Manufacturing 9

Introduction, Difference between automation and robotics, application of Robots in pre-production, cutting, sewing, finishing and transport area. Components and working principle of robots used in sewing area. Impact of sewing robots in apparel manufacturing.

UNIT V Seamless garments, bonded Technology and printing 9

Seamless garment technology, benefits, quality, durability and comfort. Seamless garment for fashion and sports application, pricing of seamless apparels, advantages of seamless technology. Bonded garments and its application. Principles and applications of digital and 3D printing.

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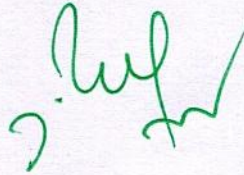
TOTAL: 45 hours

TEXTBOOKS

1. Rajkishore Nayak and Rajiv Pandhye, “Automation in Garment Manufacturing”, Woodhead Publishing Limited, 2018.
2. L. Ashok Kumar, M Senthil kumar, **Automation in Textile Machinery: Instrumentation and Control System Design Principles**, CRC press, 2018.
3. T.Karthik, P.Ganesan, D.Gopalakrishnan, “Apparel Manufacturing Technology”, Taylor & Francis Group, CRC Press, 2017.

REFERENCES

1. C.Fairhurst, “Advances in Apparel Production”, Wood head Publishing Limited, 2008.



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COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Elaborate the objective and concept of fashion retail store administration, various terminologies used in fashion retail stores
2. Explain the various functions, various steps involved in opening, running and closing a fashion retail store
3. State the importance of Staff and Space Management in fashion retail store
4. Explain about the retail mix, marketing mix and inventory control in fashion retail store
5. State the importance of MIS, Reporting Systems and Store audits in fashion retail store

CO/PO, PSO Mapping

(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
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CO3	2	2	1	2	3	2	2	2	2	1	2	2	2	2
CO4	2	2	2	2	2	2	2	2	2	2	2	2	2	2
CO5	2	2	2	2	2	2	2	1	2	2	2	2	2	2

UNIT I Fashion Retail Store Administration and Environment

9

Introduction and Objective-Fashion Retail, Organization structure of a fashion retail store. Store Administration: Introduction, Objectives, Responsibilities of Store Administrator, Role of Housekeeping Staff in a Store, Guidelines for Housekeeping, Checklist for Maintenance, Licence Renewal. Various terms used in Fashion Retail Store Operations - CKU, RFID, Footfall, Conversion, Average Ticket Value & their importance.

UNIT II Functions of Retail Store

9

Introduction, Objectives, Everyday Operations of a Retail Store. Opening and Closing a Store, Store opening process, Store closing process, Store Key Management, Checklist for Store Opening and Closing. Importance of security, Security Process in Different Situations, Pilferage and Shoplifting, Handling Legal Aspects, Handling Counterfeit Currencies, Handling Tag Beep.

UNIT III Staff and Space Management

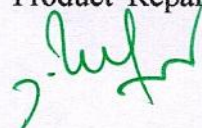
9

Introduction, Objectives, Employees and Shift Timings, Employee Entry and Attendance Recording System, Scheduling Breaks, Entry Recording System for Outsiders, Grooming Standards for Store Employees, Store Disciplinary Policy for Employees, Morning Briefing for Sales. Contribution made by each sales staff. Importance of SPF, CPF for a fashion retail store. Calculations of these and their analysis

UNIT IV Retail Mix, Marketing Mix, Inventory Control

10

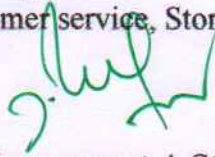
Retail mix and its importance, Marketing mix and its importance, Inventory Management in Retail: Introduction, Objectives, Inventory Management, Important terminologies in inventory management, Importance of inventory management in retail, Stock check, Negative inventory, Movement of inventory from warehouse to store, Un-loading of inventory, Product Repair System-Customer Interface, Vendor Interface, Returning Merchandise to Vendor,.



UNIT V MIS, Reporting Systems and Store audit

8

Introduction, Importance of MIS in Fashion Retail Store Operations. Types of reports required in managing a fashion retail store Concept of Store Audit, Importance of Store Audit, Parameters for Store Audit, Storefront appearance, In-store presentation, Customer service, Storage, Housekeeping



Dr. D. RAJA, M.Tech., Ph.D.,
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Department of Fashion Technology
Sona College of Technology
Salem - 636 005, Tamil Nadu

TEXT BOOKS

1. R Evans, Barry Berman Joel. "**Retailing Management-A Strategic Approach**". (2000)
2. Newman, Andrew, and Peter Cullen. **Retailing: environment & operations**. Cengage Learning EMEA, 2002.
3. Diamond, Jay, Ellen Diamond, and Sheri Litt. **Fashion retailing: a multi-channel approach**. Bloomsbury Publishing USA, 2015.
4. Chetan Bajaj, RajnishTuli, Nidhi V Srivastava, "**Retail Management**", Oxford University Press, 2005.
5. Levy, Michael, Barton A. Weitz, and Dhruv Grewal. **Retailing management**. New York, NY: Irwin/McGraw-Hill, 1998.

REFERENCE

1. Quan, Vincent, Bang Nguyen, Meng-Shan Sharon Wu, Cheng-Hao Steve Chen, Francesca Bonetti, Patsy Perry, John Fernie, Ian Phau, and Min Teah. **Luxury fashion retail management**. Edited by Tsan-Ming Choi, and Bin Shen. Springer Singapore, 2017
2. Clodfelter, Richard. **Retail buying: From basics to fashion**. Bloomsbury Publishing USA, 2015.

TOTAL: 45 Hours

COURSE OUTCOMES

At the end of the study of this course, the students will be able to,

1. Develop pattern, prepare draping model for the given measurement.
2. Drape and sew the finished pattern, 3D Simulation of garment with fabric design, fabric texture, seams trims, other surface ornamentation.
3. Check the virtual fitting with required pattern alterations.

CO/PO, PSO Mapping														
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2	3							3	3	3
CO2	3	3	3	3	3							3	3	3
CO3	3	3	3	3	3							3	3	3

LIST OF EXPERIMENTS

- I. Practice of 3D fit analysis software features. (2 sessions)

- II. Develop pattern, prepare 3D draping model for the given measurement and development of 3D garment by virtual stitching. 3D Simulation of garment with fabric design, fabric texture, seams, trims, and other surface ornamentation. Analysis of virtual fitting with required pattern alterations for the following styles:
 1. Baby's frock
 2. Men's T-shirt
 3. Men's trouser
 4. Women's tops and skirt
 5. Women's long frock

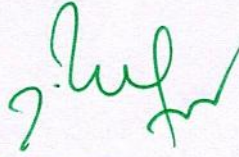

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TOTAL: 30 hours

3D VIRTUAL FIT ANALYSIS LABORATORY

List of equipment required for a batch of 30- students

S. No.	Name of the equipment / software	Quantity Required
1.	Computers-Pentium IV	30
2.	Scanner	1
3.	Printer	1
4.	Pattern Drafting, Grading and Marker Planning Software – Lectra Software	30 user licenses
5.	3D fit Software – Lectra Software	30 user licenses
Total		92



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**U19FT605 INDUSTRIAL ENGINEERING IN GARMENT PRODUCTION 0021
LABORATORY**

COURSE OUTCOMES

At the end of study of this course the students will be able to,

1. Practice the work measurement technique for cutting, sewing and packing operation.
2. Estimation of SAM of the garments through PMTS software.
3. Develop the sewing line layout for the garment production in the apparel industry.

CO/PO, PSO Mapping

(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	3	3	2	2			2	3	3	2
CO2	3	2	2	2	2	3	2					3	2	2
CO3	3	3	3	2	3	2	3	2			2	3	3	2

LIST OF EXPERIMENTS

1. Analysis of a cutting operation elements and determine the VA-NVA elements, SAM, suggestions for method improvement and capacity study through time study technique. (1 session)
2. Analysis of a sewing operation elements and determine the VA-NVA elements, SAM, suggestions for method improvement and capacity study through time study technique. (1 session)
3. Analysis of inspection and packing operation elements and determine the VA-NVA elements, SAM, suggestions for method improvement and capacity study through time study technique. (1 session)
4. Engineering operation sequence for a basic T shirt and calculation of standard allowed minute (SAM) value using predetermined time standards. (1 session)
5. Engineering operation sequence for a men's wear and calculation of standard allowed minute (SAM) value using predetermined time standards. (1 session)
6. Engineering operation sequence for a women's wear and calculation of standard allowed minute (SAM) value using predetermined time standards. (1 session)
7. Engineering operation sequence for a kid's wear and calculation of standard allowed minute (SAM) value using predetermined time standards (1 session)
8. Preparation of operation bulletin, line balancing, cost per minute and the development of sewing line layout for the given garment. (1 session)
9. Determination of sewing threads consumption for the given garment. (1 session)
10. Identify suitable folders and attachments for the production of given garment samples. Analyse the given operation and design a new folder/attachment.

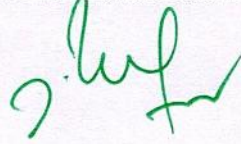
TOTAL: 30 hours

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INDUSTRIAL ENGINEERING IN GARMENT PRODUCTION LABORATORY

List of equipment required for a batch of 30 students

S. No.	Name of the equipment / software	Quantity Required
1.	Computer (Pentium i5)	30
2.	Stop watch	15
Total		45



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Sona College of Technology
Salem - 636 005. Tamil Nadu

Semester –VI	U19GE601: SOFT SKILLS AND APTITUDE – IV (Common to all dept except Civil)	L	T	P	C	Marks
Course Outcomes At the end of the course the student will be able to:						
1. Demonstrate capabilities in job-oriented company selection processes using the hands-on approach						
2. Solve problems of any given level of complexity in all areas of quantitative aptitude and logical reasoning and score 70-75% marks in company-specific internal tests						
3. Demonstrate advanced-level verbal aptitude skills in English and score 70-75% marks in company-specific internal tests						
1. Soft Skills	Demonstrating Soft -Skills capabilities with reference to the following topics: a. Mock group discussions b. Mock interviews c. Mock stress interviews					
2. Quantitative Aptitude and Logical Reasoning	Solving problems with reference to the following topics: a. Functions and Polynomials b. Clocks and Calendars c. Data Sufficiency: Introductions, 3 Options Data Sufficiency, 4 Options Data Sufficiency and 5 Options Data Sufficiency. d. Logical reasoning: Cubes, Non Verbal reasoning and Symbol based Reasoning. e. Decision making table and Flowchart Campus recruitment papers: Solving of previous year questions paper of all major recruiters f. Miscellaneous: Cognitive gaming Puzzles-(Picture, Word and Number based), IQ Puzzles, Calculation Techniques and Time Management Strategies. g. Trigonometry.- Concepts					
3. Verbal Aptitude	Demonstrating English language skills with reference to the following topics: a. Writing captions for given pictures b. Reading comprehension c. Critical reasoning d. Theme detection e. Jumbled sentences f. Writing a story on given pictures g. Company specific verbal questions					

30 Hours

S. Anita
18/12/2023

Dr.S.Anita
Professor and Head
Department of Training
Dr. S. ANITA
Professor and Head
Department of Training,
SONA COLLEGE OF TECHNOLOGY,
SALEM-636 005.

COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Identify case study and innovative ideas related to the subjects learnt in the current semester.
2. Execute a mini project related to the case study and innovative ideas identified by the students.
3. Function effectively on teams and to communicate effectively and develop report with results and conclusion of the mini project work.

COs	CO/PO, PSO Mapping														
	(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3

The evaluation of mini project shall be conducted in the form of creative methodology as **Hackathon**.

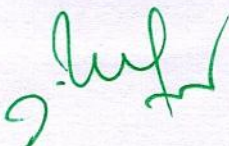
Methodology:

- The students' group shall present their chosen problem statement and justify their selection.
- During review 2, they shall present their solution methodology to the chosen problem statement and also present the requirement.
- During review 3, the group shall present the progress made on the prototype development.
- The office of COE shall give 3 days to conduct the hackathon. During first two days, the students' group shall complete developing their prototype and showcase the same on the third day as video presentation/demonstration of the working model to the team of evaluators.

The evaluation is carried out in the following way:

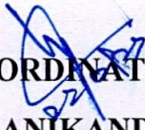
- The team consist of industry personnel, faculty and peer students. Evaluation metrics and rubrics are provided to each of the evaluators. For computing the final marks, 50% weightage from industry evaluators, 40% weightage from faculty evaluators and 10% weightage from student evaluators, is considered. The numbers of industry evaluators and faculty evaluators for each programme will be decided by the HOD and COE as per the number of teams.
- Industry evaluators are appointed by the office of COE for which the list of such evaluators is provided by the respective departments. The faculty evaluators are also appointed by the office of COE as recommended by the respective HOD. The peer evaluators are chosen by the coordinators as one student from each team.
- Within 5 days after the completion of Hackathaoon, the students shall submit the mini project report as per the approved guidelines given by the Controller of Examinations.


Total: 30 hours



U19BM1001		HOSPITAL MANAGEMENT											L	T	P	C
													3	0	0	3
COURSE OUTCOMES																
On successful completion of this course, the student will be able to																
CO1	•	Describe the basics of Hospital Management.														
CO2	•	Illustrate the knowledge of Human resource management and marketing in hospitals.														
CO3	•	Apply various Quantitative methods in healthcare management.														
CO4	•	Amalgamate their knowledge in Hospital information system and supportive services.														
CO5	•	Explain the quality and safety aspects in Hospital.														
CO/PO, PSO Mapping																
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak																
CO's	Programme Outcomes (PO's) and Programme Specific Outcomes (PSO's)															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO1	2	1	1	-	-	2	1	2	2	1	2	1	-	2	1	
CO2	2	1	1	-	-	2	1	2	3	1	2	1	-	2	1	
CO3	2	1	1	-	-	2	1	2	3	1	1	1	-	2	1	
CO4	2	1	1	-	-	2	1	2	2	1	1	1	-	2	1	
CO5	2	1	1	-	-	2	1	2	2	1	1	1	-	2	1	
UNIT I INTRODUCTION TO HOSPITAL ADMINISTRATION 9																
Distinction between Hospital and Industry, Challenges in Hospital Administration, Hospital Planning, Equipment Planning, Functional Planning, Current Issues in Hospital Management, Role of Manager, Leadership, Motivation, Organizational behaviour, Strategic planning, Ethics and Law, Fraud and abuse.																
UNIT II HUMAN RESOURCE MANAGEMENT AND MARKETING 9																
Principles of HRM, Functions of HRM, Profile of HRD Manager, Tools of HRD, Human Resource Inventory, Manpower Planning. Different Departments of Hospital, Recruitment, Selection, Training Guidelines, Methods of Training, Leadership grooming and Training, Promotion, Transfer.																
UNIT III QUANTITATIVE METHODS IN HEALTHCARE MANAGEMENT 9																
Introduction to quantitative decision-making methods in healthcare management, Forecasting, Decision making in healthcare facilities, Facility location, Facility layout, Reengineering, Staffing, Scheduling, Productivity, Resource allocation, Supply chain and inventory management, Quality Control, Project Management, Queuing models and capacity planning.																

UNIT IV	HOSPITAL INFORMATION SYSTEM AND SUPPORTIVE SERVICES	9
Clinical Information Systems, Administrative Information Systems, Support Service Technical Information Systems, Medical Records Department, Central Sterilization and Supply Department – Pharmacy, Food Services, Laundry Services, Telemedicine.		
UNIT V	QUALITY AND SAFETY ASPECTS IN HOSPITAL MANAGEMENT	9
Quality system, Elements, implementation of quality system, Documentation, Quality auditing, International Standards ISO 9000 – 9004. Features of ISO 9001, ISO 14000, Environment Management Systems. NABA, JCI, NABL. Security, Loss Prevention, Fire Safety, Alarm System, Safety Rules.		
TOTAL : 45 Hours		
TEXTBOOKS:		
1.	R.C. Goyal, Hospital Administration and Human Resource Management, PHI, 4th Edition, 2006.	
2.	G.D. Kunders, Hospitals – Facilities Planning and Management, TMH, New Delhi, 5th Reprint, 2007.	
REFERENCES:		
1.	Sharon B. Buchbinder and Nancy H. Shanks, Introduction to Healthcare Management, Jones and Bartlett Learning, 2017	
2.	Blane, David, Brunner, Health and SOCIAL Organization: Towards a Health Policy for the 21st Century, Eric Calrendon Press, 2002.	
3.	Yasar A. Ozcan, Quantitative Methods in Healthcare management, Jossey Bass- John Wiley and Sons, 2009.	


COORDINATOR
K.MANIKANDAN
 Asst. Prof /BME


CHAIRMAN
BoS-BME

Dr.S.PRABAKAR, M.E., Ph.D.,
 Professor and Head
 Department of Biomedical Engineering
 Sona College of Technology, Salem-5

PREAMBLE**To****Municipal Solid Waste Management**


Solid wastes represent one of the main environmental problems in India that needs to be dealt with. In order to minimize environmental impacts and pave the way for a sustainable development, integrated and specific actions need to be adopted and implemented. Due to rapid increase in the production and consumption processes, societies generate as well as reject solid materials regularly from various sectors – agricultural, commercial, domestic, industrial and institutional. The present course covers evaluation on the type and nature of wastes, estimation of total volumes and assessment of handling, storage, transportation and disposal methods to be adopted and the potential environmental impacts.

The overall objectives of the course:

- To assess the activities involved for the proposed and determine the type, nature and estimated volumes of waste to be generated.
- To identify any potential environmental impacts from the generation of waste at the site;
- To recommend appropriate waste handling and disposal measures / routings in accordance with the current legislative and administrative requirements; and
- To categories waste material where practicable (inert material / waste fractions) for disposal considerations i.e. public filling areas / landfill.

COURSE CODE	COURSE NAME												L	T	P	C
U19CE1002	MUNICIPAL SOLID WASTE MANAGEMENT												3	0	0	3
Course Objective (s): The Purpose of learning this course is to:																
1.	Provide a broader understanding on various aspects of sources and solid waste management.															
2.	Impart the basic knowledge in the methods and processing of on-site storage.															
3.	Provide the basic knowledge of types of collection vehicles and transfer stations.															
4.	Aware the students about different techniques involved in off-site processing.															
5.	Awareness to be given on disposing the wastes using sanitary landfills.															
Course Outcome (s) (COs): At the end of this course, the students will be able to:																
CO1	Identify the sources, types and characteristics of solid wastes. (K1)															
CO2	Choose the on-site storage methods and processing techniques. (K2)															
CO3	Summarize the methods of collection and its components. (K2)															
CO4	Outline the off-site processing techniques & equipment's and resource recovery from solid wastes. (K3)															
CO5	Evaluate the processing techniques and disposal methods for managing the municipal solid wastes. (K4)															
Knowledge Level: K1 – Remember: K2 – Understand: K3 – Apply: K4 – Analyze: K5 – Evaluate:																
CO – PO Mapping																
Cos	Pos												PSOs			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	POS		
CO1	3	2	-	-	-	2	2	1	-	-	-	-	2	-		
CO2	3	-	-	-	-	3	2	-	-	-	-	-	2	-		
CO3	3	-	-	-	-	2	2	1	-	-	-	3	2	-		
CO4	3	-	-	-	3	3	2	1	-	-	-	3	2	3		
CO5	3	3	3	-	3	3	2	1	-	-	-	3	2	3		
CO (Avg)	3	1	0.6	-	1.2	2.6	2	0.8	-	-	-	1.8	2	1.2		

Correlation Level:		1:Slight (Low)	2:Moderate (Medium)	3:Substantial (High)
UNIT-I	SOURCES AND TYPES			9 Hours
Sources and types of solid wastes - Quantity - factors affecting generation of solid wastes; characteristics - methods of sampling and characterization; Effects of improper disposal of solid wastes - public health effects. Principle of solid waste management –IOT Applications in Waste management; Public awareness; Role of NGOs; Solid waste management rules 2016 - Construction and demolition Wastes				
UNIT-II	ON-SITE STORAGE AND PROCESSING			9 Hours
On-site storage methods - Materials used for containers - on-site segregation of solid wastes - public health & economic aspects of storage - options under Indian conditions - Critical evaluation of options.				
UNIT-III	COLLECTION AND TRANSFER			9 Hours
Methods of Residential and commercial waste collection - Collection vehicles - Manpower- collection routes - Analysis of collection systems; Transfer stations - Selection of location, operation & maintenance; options under Indian conditions - Field problems- solving				
UNIT-IV	OFF-SITE PROCESSING			9 Hours
Processing techniques and equipment; Resource recovery from solid wastes - Composting, incineration, Pyrolysis - Options under Indian conditions - Case studies.				
UNIT-V	DISPOSAL			9 Hours
Dumping of solid waste; Sanitary landfills - Site selection, design and operation of sanitary landfills -Leachate collection and treatment, Land fill bio reactor, Landfill capping, Landfill mining.				
				TOTAL: 45 Hours
TEXT BOOKS:				
1.	George Tchobanoglous, "Integrated Solid Waste Management", McGraw-Hill Publishers,2003.			
2.	Vesilind P.A. and Rimer A.E, "Unit Operations in Resource Recovery Engineering", Prentice Hall, Inc., 1981			
REFERENCES:				
1.	Manual on Municipal Solid Waste Management, CPHEEO, Ministry of Urban Development, Government of India, New Delhi, 2000.			
2.	Landreth R.E, and P.A and Rebers, "Municipal Solid Wastes –problems and Solutions", Lewis Publishers, 2000.			
3.	Ramachandra T.V, "Management of Municipal Solid Waste", TERI press, New Delhi, 2009.			
4.	Paul T Willams, "Waste Treatment and Disposal", John Wiley and Sons, 2000			
5.	http://nptel.iitm.ac.in			


Dr. R. MALATHY
 Head Of The Department.
 Dean (R&D) of Civil Engg.
 Sona College of Technology,
 SALEM-636 005.

PREAMBLE**To
Energy Efficiency and Green Building**

- Green building, or sustainable design, is the practice of increasing the efficiency with which buildings and their sites use energy, water, and materials, and of reducing impacts on human health and the environment for the entire lifecycle of a building.
- A sustainable building or green building is an outcome of a design philosophy which focuses on increasing the efficiency of resource use-energy, water, and materials-while reducing building impacts on human health and the environment during the building's lifecycle, through better siting, design and construction.
- Solar water heating further reduces energy costs. Onsite generation of renewable energy through solar power, wind power, hydro power, or biomass can significantly reduce the environmental impact of the building. Power generation is generally the most expensive feature to add to a building.

Green buildings are designed in such a way to reduce overall impact on environment and human health by:

- Reducing trash, pollution and degradation of environment.
- Efficiently using energy, water and other resources.
- Protecting occupant health and improving productivity.

COURSE CODE	COURSE NAME												L	T	P	C
U19CE1003	ENERGY EFFICIENCY AND GREEN BUILDING												3	0	0	3
Course Objective (s): The Purpose of learning this course is to:																
1.	To describe the importance of energy resources, its availability and conservation for sustainability goals.															
2.	To study and identify the methods adopted to make the building as energy efficient.															
3.	To gain knowledge about use of construction materials based on embodied energy values															
4.	To study about different green building rating systems with real time examples.															
5.	To create awareness about clean development mechanism and the role of UNFCCC in sustainability															
Course Outcome (s) (COs): At the end of this course, the students will be able to:																
CO1	Acquire the basics understanding of green building concept and associated resources. (K1)															
CO2	Analyze the various methods to design green building parameters. (K3)															
CO3	Understand the availability of construction materials for energy efficient construction (K4)															
CO4	Aware about the various green building rating systems prevail in the country (K3)															
CO5	Understand the role of UNFCCC and know about clean development mechanism (K2)															
Knowledge Level: K1 – Remember: K2 – Understand: K3 – Apply: K4 – Analyze: K5 – Evaluate:																
CO – PO Mapping																
COs	Pos												PSOs			
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	POS		
CO1	3	1	3	1	2	1	3	1	1	-	-	3	2	2		
CO2	3	1	3	1	2	1	3	1	1	-	-	3	2	2		
CO3	3	1	3	1	1	1	3	1	1	-	-	2	2	2		
CO4	2	2	3	1	1	1	3	2	1	-	-	2	2	1		
CO5	2	2	3	1	1	1	3	2	1	-	-	2	2	1		
CO (Avg)	2.6	1.4	3	1	1.4	1	3	1.4	1	-	-	2.4	2	1.6		
Correlation Level: 1:Slight (Low) 2:Moderate (Medium) 3:Substantial (High)																

UNIT-I	INTRODUCTION	9 Hours
Definition and concepts, Energy and water as a resource - Criticality of resources - Needs of modern living - Heat loss and heat gain in buildings- thermal comfort improvement methods - other building comforts -indoor air quality requirements - electrical energy conservation.		
UNIT-II	ENERGY EFFICIENT BUILDINGS	9 Hours
Zero Energy Building (ZEB) - Nearly Zero Energy Building (NZEB) - energy consumption - defining low energy buildings- opportunities and techniques for energy conservation in buildings - water conservation - water management system - water efficient landscaping - green roofing - rainwater harvesting - sanitary fixtures and plumbing systems - wastewater treatment and reuse - process water strategies - adoption to sustainable resources, process and technologies- Energy Conservation Opportunities in Public and Private Buildings.		
UNIT-III	CONSTRUCTION MATERIALS AND PRACTICES	9 Hours
Construction materials - Embodied energy, carbon content, and emission of CO ₂ , SO ₂ and NO _x of building materials, elements and construction process- Current practice and low environmental impact alternatives.		
UNIT-IV	BUILDING ASSESSMENT SCHEMES	9 Hours
Energy efficiency ratings & ECBC - 2007 - Various energy efficiency rating systems for buildings - LEED, BEE, & GRIHA - case studies.		
UNIT-V	CLEAN DEVELOPMENT MECHANISM	9 Hours
Clean Development Mechanism - CDM Benefits for energy conservation methodology and procedure - Eligibility Criteria - UNFCCC - role of UNFCCC and Government of India.		
		TOTAL: 45 Hours
TEXT BOOKS:		
1.	Sustainable Building, Design Manual: Published by The Energy and Resources Institute, Darbari Seth block, IHC Complex, Lodhi Road, New Delhi-110003.	
2.	KILBERT, Charles , (2008) Sustainable construction : Green Building Design and Delivery John Wiley and Sons..	
3.	BROWN, G.Z. and DEKAY, Mark, 2001. Sun, Wind & Light - Architectural Design Strategies, Second Edition , John Wiley & sons, Inc.	
REFERENCES:		
1.	ECBC Code 2007 (Edition 2008) published by Bureau of Energy Efficiency, New Delhi	
2.	Bureau of Energy Efficiency Publications - rating System, TERI PUBLICATIONS .	
3.	GRIHA Rating System, LEED Publications	


Dr. R. MALATHY
 Head Of The Department.
 Dean (R&D) of Civil Engg.
 Sona College of Technology,
 SALEM-636 005.

COURSE OUTCOMES:**At the end of the course the students will be able to**

- Compare and analyze different types of digital data characteristics of Big Data
- Implement programs using Hadoop open source software framework
- Design and develop programs using NoSQL Databases like Mongo DB and Cassandra
- Apply MapReduce programming for various big data based problems
- Implement programs using Hive and Pig Databases

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	2	1	2	0	1	0	2	1	2	2	2
CO2	2	1	2	2	3	2	0	1	1	2	2	2	2	2
CO3	2	1	2	3	3	2	1	1	1	2	3	2	2	3
CO4	3	1	2	3	3	2	0	1	0	2	3	2	2	3
CO5	2	2	3	3	3	1	0	1	0	2	3	2	3	3

UNIT I INTRODUCTION TO BIG DATA**9**

Types of Digital Data: Classification of Digital Data Characteristics of Data, Evolution of Big Data, Definition of Big Data, Challenges with Big Data, Characteristics of Big Data ,Traditional Business Intelligence (BI) versus Big Data, A Typical Data Warehouse Environment , A Typical Hadoop Environment.

UNIT II BIG DATA ANALYTICS**9**

Introduction -Big Data Analytics, Classification of Analytics, Challenges in Big Data, Technologies to handle Challenges Posed by Big Data- Data Science- Data Scientist, Terminologies Used in Big Data Environments, Basically Available Soft State Eventual Consistency (BASE), Few Top Analytics Tools.

UNIT III HADOOP**9**

Introduction Hadoop, RDBMS versus Hadoop, Distributed Computing Challenges ,History of Hadoop , Hadoop Overview, Use Case of Hadoop ,Hadoop Distributors ,HDFS (Hadoop Distributed File System),Processing Data with Hadoop, Managing Resources and Applications with Hadoop YARN (Yet another Resource Negotiator),Interacting with Hadoop Ecosystem, MapReduce Programming -Mapper, Reducer, Combiner, Partitioner, Searching, Sorting, Compression

UNIT IV NO SQL DATABASES

9

Cassandra :Apache Cassandra - An Introduction , Features of Cassandra, CQL Data types, CQLSH, Keyspaces, CRUD (Create, Read, Update and Delete) Operations, Collections, Using a Counter, Time to Live (TTL), Alter Commands, Import and Export, Querying System Tables, Practice Examples- MongoDB, Terms Used in RDBMS and MongoDB, Data Types in MongoDB , MongoDB Query Language

UNIT V HIVE AND PIG

9

Hive: Introduction to Hive, Hive Architecture, Hive Data Types, Hive File Format, Hive Query Language (HQL), RCFile Implementation, SerDe, User-defined Function(UDF).

Pig: Introduction to Pig, The Anatomy of Pig, Pig on Hadoop , Pig Philosophy, Use Case for Pig: ETL Processing, Pig Latin Overview , Data Types in Pig ,Running Pig , Execution Modes of Pig ,HDFS Commands ,Relational Operators ,Eval Function ,Complex Data Types ,Piggy Bank, User-Defined Functions (UDF) ,Parameter Substitution , Diagnostic Operator , Word Count Example using Pig,Pig versus Hive


Total: 45 hours

TEXT BOOKS:

1. **Big Data and Analytics**, Seema Acharya, Subhashini Chellappan, Infosys Limited, Publication: Wiley India Private Limited,1st Edition 2015(Chapters 1,2,3,4,5,6,7,8,9,10)

REFERENCE BOOKS:

1. **Hadoop in Practice**, Alex Holmes, Manning Publications Co., September 2014, Second Edition.
2. **Programming Pig**, Alan Gates, O'Reilly, Kindle Publication.
3. **Programming Hive**, Dean Wampler, O'Reilly, Kindle Publication.


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PREAMBLE

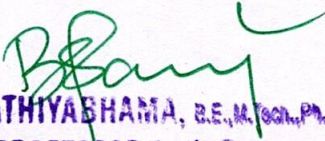
The "Internet of Things" (IoT) is the network of physical objects or "things" embedded with sensors, actuators, software, electronics and network connectivity to enable it to achieve greater value and service by exchanging data between the physical world and computer systems over existing network infrastructure. By connecting everyday real world objects such as transports, buildings and industrial equipments, IoT guarantees to revolutionize how we live and work. In the year 2020, it is estimated that approximately 30 billion devices will be connected in IoT. IoT will drive new consumer and business behavior that will demand increasingly intelligent industry solutions. It can also help various industries like agriculture, health services, energy, security, disaster management etc., which need to automate solutions to problems faced through remotely connected devices.

The Internet of Things involves three distinct stages:

1. The sensors which collect data (including identification and addressing the sensor/device)
2. An application which collects and analyzes this data for further consolidation
3. Decision making and the transmission of data to the decision-making server. Analytical engines, actuators and Big data may be used for the decision making process.

After completing the course the students will attain the following,

- Ability to build real time IoT applications by interfacing the sensors with minimal programming.
- Ability to associate sensor networks and communication modules for building IoT systems.


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COURSE OUTCOMES:**At the end of the course the students will be able to**

- Recall characteristics, physical and logical designs, domains.
- Differentiate IoT and M2M and explain IoT design methodology.
- Describe the various IoT components.
- Design a portable IoT system using Arduino/Raspberry Pi.
- Discuss the various applications of IoT.

UNIT I FUNDAMENTALS OF IOT 9

Introduction-Definition and Characteristics of IoT- Physical design- IoT Protocols-Logical design - IoT communication models, Iot Communication APIs- Enabling technologies - Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates - Domain specific IoTs.

UNIT II M2M AND IOT DESIGN METHODOLOGY 9

IoT and M2M- difference between IoT and M2M - Software defined networks, network function virtualization- Needs- IoT design methodology

UNIT III IOT COMPONENTS 9

Sensors and actuators - Communication modules - Zigbee- RFID-Wi-Fi-Power sources.

UNIT IV BUILDING IOT WITH HARDWARE PLATFORMS 9

Platform - Arduino/Raspberry Pi- Physical devices - Interfaces - Programming - APIs/Packages

UNIT V CASE STUDY 9

Various Real time applications of IoT- Home automation-Automatic lighting-Home intrusion detection- Cities-Smart parking-Environment-Weather monitoring system- Agriculture-Smart irrigation.

TOTAL: 45 PERIODS**TEXT BOOK:**

1. Arshdeep Bahga, Vijay Madisetti, "Internet of Things-A hands-on approach", Universities Press, 2015.

REFERENCES:

1. Manoel Carlos Ramon, —Intel® Galileo and Intel® Galileo Gen 2: API Features and Arduino Projects for Linux Programmers!, Apress, 2014.
2. Marco Schwartz, —Internet of Things with the Arduino Yun!, Packt Publishing, 2014.
3. Adrian McEwen, Hakim Cassimally, “Designing the Internet of Things”, Wiley Publications, 2012.
4. Olivier Hersent, David Boswarthick, Omar Elloumi, “The Internet of Things: Key applications and Protocols”, Wiley Publications 2nd edition , 2013.

Course Outcomes

At the end of the course, the student will be able to

- 1) Analyze the 1G and 2G Technologies.
- 2) Explain the 2.5G evolutions
- 3) Analyze the principles of 3G and UMTS
- 4) Analyze the evolutions of 4G.
- 5) Summarize the various wireless security applications and solve the mobile phone faults.

CO / PO, PSO Mapping
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	P09	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	3	3		1		1	1	3		
CO2	3	3	3	3	3	3		1		1	1	3		
CO3	3	3	3	3	3	3		1		1	1	3		
CO4	3	3	3	3	3	3		1		1	1	3		
CO5	3	3	3	3	3	3		1		1	1	3		

Unit I 1G and 2G

9

First Generation (1G): 1G Systems – General 1G System Architecture – Generic MTSSO Configuration – Generic Cell Site Configuration – Call Setup Scenarios – Handoff – Frequency Reuse – Spectrum Allocation – Channel Band Plan

Second generation (2G): Enhancements over 1G Systems – Integration with Existing 1G Systems – GSM - iDEN – CDPD

Unit II 2.5G Generation

9

Enhancements over 2G – Technology Platforms – General Packet Radio Service (GPRS) – Enhanced Data Rates for Global Evolution (EDGE) – High-Speed Circuit Switched Data (HSCSD) – CDMA2000 (1XRTT) – WAP-Migration Path from 2G to 2.5G to 3G..

Dr. R.S. SABEENIAN

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Unit III 3G Generation

9

Introduction – Universal Mobile Telecommunications Service (UMTS), UMTS Basics, The UTRAN Architecture, Handover, UMTS Services – The UMTS Air Interface – Overview of the 3GPP Network Architecture – Overview CDMA2000 – Commonality Between WCDMA/CDMA2000/CDM

Unit IV 4G and Beyond

9

Introduction to LTE - Network architectures – EPC – E-UTRAN architecture – Mobility management – Resource management – Services – Channel – logical and transport channel mapping – downlink/uplink data transfer – MAC control element – PDU packet formats – scheduling services – random access procedure – Objectives of 5G-Architecture – Features and benefits.

Unit V Wireless Security and Mobile Phone service

9

Introduction – Fingerprint – Classification of major security attacks against RFID systems – GSM Security – Barcode scanner technology features and applications – QR code – BAR code – OTP – AirDrop.
Mobile phone Service: Parts in the mobile phones -Mobile phones assembling and disassembling –motherboard - Mobile Operating Systems - Fault finding - Advanced troubleshooting techniques.

TOTAL : 45 HOURS

Text Book

- 1) Clint Smith,P.E, Dannel Collins, “3G Wireless Networks” 2nd edition, Tata McGraw-Hill, 2008.
- 2) Vijay K.Garg, “Wireless Network Evolution- 2G & 3G” Pearson, 2013.

References

- 1) T.S Rapp port, “Wireless Communications” Principles and Practice, Second Edition, Pearson Education/ Prentice Hall of India, Third Indian Reprint, 2013.
- 2) JochenH.Schiller, “Mobile Communications”, 2/e, Pearson, 2014
- 3) SassanAhmadi, “LTE-Advanced – A practical systems approach to understanding the 3GPP LTE Releases 10 and 11 radio access technologies”, Elsevier, 2014

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COURSE OUTCOMES

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

1. Assess role of energy in global economic development.
2. Explain methodology of energy audit and concept of instruments used.
3. Discuss various lamps and design energy efficient illumination schemes.
4. Apply energy conservation concepts in buildings.
5. Identify the energy conserving opportunities in utilities.

CO / PO, PSO Mapping

(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak

COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	3	3	3		2			2	3	3	3	2
CO2	2	2	3	3	3				2			3	3	2
CO3	2	2	3	3	3	3			3			3	3	2
CO4	2	2	3	3	3	2		3				3	3	2
CO5	2	2	3	3	3		3			3		3	3	2

UNIT- I ENERGY SCENARIO AND BASICS

9

Classification of Energy – Purchasing Power Parity – Energy Security – Strategy to meet future energy requirements – Objectives and features for electricity act 2003 – Energy efficiency standards and labeling – Study of Global and Indian primary energy reserves – Study of energy scenario for India – Energy and environment – Global environmental issues – Types of Energy – Electrical and Thermal energy basics – Energy units and conversions.

UNIT- II ENERGY MANAGEMENT AND AUDIT

9

Definition and objectives of energy management and audit – Need for energy audit – Types of energy audit – Methodology for conducting detailed energy audit – ENCON opportunities and measures – Energy audit report. Energy costs – Benchmarking – Energy performance – Fuel and Energy substitution – Instruments and metering for energy audit – Basic principles, components of material and energy balance – Sankey diagram – Financial analysis terms – Payback period, ROI, NPV, IRR.

UNIT- III LIGHTING SYSTEMS

9

Introduction – Terms in Lighting and Illumination – Light sources - Lamp types – Arc Lamps, Vapour lamps = Incandescent lamp, Fluorescent lamp = Energy saving lamps = CFL, LED = Lighting design for interiors – Indoor and outdoor lighting schemes – Energy saving opportunities – Energy efficient lighting controls.

UNIT- IV ENERGY CONSERVATION IN BUILDINGS

9

Energy conservation building code (ECBC) – Compliance approaches – ECBC guidelines on Building envelope, HVAC system, Service hot water, Water pumps – Energy consumption in Escalators and Elevators – Building Energy Management Systems – Star ratings – Energy Efficiency Measures in AC and Lighting system.

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UNIT-V ENERGY EFFICIENT OPPORTUNITIES IN UTILITIES

9

Introduction to Compressed air system components – Heat transfer loops in refrigeration systems – Standards and labelling of room air conditioners – Introduction to Fans, Blowers and Compressors – Types of pumps, Pump curves – Efficient operation of pumps – Components of cooling towers and its efficient operation - Introduction to DG set system.

Energy Efficiency and energy savings in Compressed Air System, HVAC system, Fans and Blowers, Pumping system, Cooling towers, and DG sets.

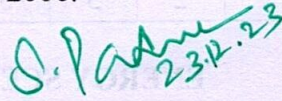
Lecture: 45; Tutorial: 00; Total: 45

TEXT BOOKS:

1. "General Aspects of Energy Management and Energy Audit", Bureau of Energy Efficiency, Fourth Edition, 2015.
2. "Energy Efficiency in Electrical Utilities", Bureau of Energy Efficiency, Fourth Edition, 2015.

REFERENCE BOOKS:

1. Chakrabarti A, "Energy Engineering and Management", PHI, 2011.
2. Murphy W R, McKay G, "Energy management", Elsevier, 2009.
3. Rajput R K, "Utilization of Electrical Power", Lakshmi Publications, 2006.


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COURSE OUTCOMES

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

1. Acquire the knowledge for establishment of an enterprise and management,
2. Derive innovative ideas, right approach to the problem and arrive solution for problem with IPR and its legal aspects.
3. Prepare the project report preparation and assessment of Business.
4. Acquire the knowledge on costing, Techno-economic aspects, find out the sources of finance and opportunities in business.
5. Identify the support system for Entrepreneurs by Government and venture capitals.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1			3			3	3		3	3	3	3		3
CO2			3			3	3	3	3	3	3	3		3
CO3			3			3	3	3	3	3	3	3		3
CO4			3			3	3	3	3	3	3	3		3
CO5			3			3	3	3	3	3	3	3		3

UNIT I ENTREPRENEURSHIP & MOTIVATION 9
 Entrepreneur – Types of Entrepreneurs – Difference between Entrepreneur and Intrapreneur
 Entrepreneurship in Economic Growth, Factors Affecting Entrepreneurial Growth. Major Motives
 Influencing an Entrepreneur – Achievement Motivation Training, Self-Rating, Business Games, Thematic
 Apperception Test – Stress Management, Entrepreneurship Development Programs – Need, Objectives.

UNIT II INNOVATION, CREATIVITY, DEVELOPMENT PROCESS AND LEGAL ASPECTS 9
 Innovation and Creativity- An Introduction, Innovation in Current Environment, Types of Innovation
 Sources of new Ideas, Methods of generating innovative ideas, creating problem solving, product
 planning and development process. Legal aspects of business (IPR, Labor law).

UNIT III BUSINESS 9
 Small Enterprises – Definition, Classification – Characteristics, Ownership Structures – Project
 Formulation – Steps involved in setting up a Business – identifying, selecting a Good Business
 opportunity, Market Survey and Research, Techno Economic Feasibility Assessment – Preparation of
 Preliminary Project Reports – Project Appraisal – Sources of Information – Classification of Needs and
 Agencies.

UNIT IV FINANCING AND ACCOUNTING 9
 Need – Sources of Finance, Term Loans, Capital Structure, Financial Institution, Management of working
 Capital, Costing, Break Even Analysis, Taxation – Income Tax, GST.

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23.12.23

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UNIT V SUPPORT TO ENTREPRENEURS

9

Sickness in small Business – Concept, Magnitude, Causes and Consequences, Corrective Measures - Business Incubators – Government Policy for Small Scale Enterprises – Growth Strategies in small industry – Expansion, Diversification, Joint Venture, Merger and Sub Contracting.

Lecture: 45; Tutorial: 0; Total: 45 Hrs

TEXT BOOKS:

1. Khanka. S.S., "Entrepreneurial Development" S.Chand& Co. Ltd., Ram Nagar, New Delhi, 2013. 99
2. Donald F Kuratko, "Entrepreneurship – Theory, Process and Practice", 9 th Edition, Cengage Learning, 2014.

REFERENCES:

1. Hisrich R D, Peters M P, "Entrepreneurship" 8th Edition, Tata McGraw-Hill, 2013.
2. Mathew J Manimala, "Entrepreneurship theory at cross roads: paradigms and praxis" 2 nd Edition Dream tech, 2005.
3. Rajeev Roy, "Entrepreneurship" 2 nd Edition, Oxford University Press, 2011.
4. EDII "Faulty and External Experts – A Hand Book for New Entrepreneurs Publishers: Entrepreneurship Development", Institute of India, Ahmadabad, 1986.
5. Innovation and Entrepreneurship Book by Peter Drucker,
6. James Larminie and John Lowry, "Electric Vehicle Technology Explained " John Wiley & Sons, 2003.

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COURSE OUTCOMES

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

1. Describe the power demand scenario in world level and impact of various renewable energy sources in satisfying power demand.
2. Explain the principle of operation and the application of solar system.
3. Outline in the components and to find the suitability based on the performance of wind energy and Conversion system, biomass energy system
4. Describe the principle of operation and the application of geo thermal power tidal power generation scheme, wave energy and OTEC scheme.
5. Illustrate the emerging energy generation systems of MHD, Thermal and fuel cells applications.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2		2					2		2	3	3	3
CO2	3	3	3	2	1	3	3	1	2		3	3	3	3
CO3	3	3	3	2	2	3	3	1	2		3	3	3	3
CO4	3	3	3	2	2	3	3	1	2		3	3	3	3
CO5	3	3	3	2	2	3	3	1	2		3	3	3	3

UNIT I INTRODUCTION

9

World energy futures–Energy sources and their availability – Energy cycle of the earth – environmental aspects of energyutilization – Energy plantation- Renewable energy resources and their importance- Prospects of Renewable energy sources.

UNIT II SOLARENERGY SYSTEMS

9

Introduction –Solar radiation and measurements-Solar energy collectors-solar energy storage systems- Solar pond and applications- Applications of solar energy: solar pumping, solar cooking, solar distillation and solar greenhouse.

UNIT III WIND AND BIOMASS ENERGYSYSTEMS

9

Introduction – Wind Energy conversion- Wind speed and power relation – Power extracted from wind – wind distributionand wind speed predictions – types of Wind power systems.

Bio mass conversion technologies-Biogas generation-Types of biogas plants-Bio gas from plant wastes- Utilization of Bio gas and applications.

UNIT IV GEOTHERMAL, TIDAL AND OCEAN ENERGY SYSTEMS

9

Geothermal energy – Estimates of Geothermal power- site selection for geothermal power plant- Applications of Geothermal energy.

Origin of tides – Basic principle of Tidal power- Operation of a Tidal power plant. Ocean Thermal Energy conversion system- Open and closed OTEC cycles- Prospects of ocean thermal energy conversion in India.

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UNIT V EMERGING ENERGY SYSTEMS

Magneto Hydro Dynamic (MHD) Power Generation- MHD systems and its operation. Thermo Electric power generation- Basic principle- Thermo electric power generator.

Thermonuclear fusion energy-Nuclear fusion and reactions- Advantages. Fuel cell- classification of fuel cells- Fuel cell based electrical power generation scheme- Applications.

Lecture: 45; Tutorial: 0; Total: 45 Hours

TEXT BOOKS:

1. Rai, G.D., "Non-Conventional Energy Sources", Khanna Publishers, Sixth Edition 2017.
2. Khan, B.H, Non- Conventional Energy Resources", Mc. Graw Hill Education Ltd, third reprint 2017.

REFERENCE BOOK

1. Rao S. Paruklekar, B.B, "Energy Technology – Non Conventional, Renewable and Conventional", Khanna Publishers, 1994.
2. F.Kreith and J.F.Kreider, "Principles of Solar Engineering", McGraw Hill.
3. T.N.Veziroglu, "Alternative Energy Sources", Vol 5 and 6, McGraw Hill.
4. MukundR.Patel, "Wind and Solar Power Systems", CRC Press LLC.

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COURSE CODE U19ME1002

L T P C

COURSE NAME INDUSTRIAL SAFETY

3 - - 3

Course Outcomes

Upon completion of this course the students will be able to

- CO1** Summarize various legal provisions available in safety regulation.
- CO2** Analyze industrial environment hygiene and develop precautionary measure to avert occupational diseases.
- CO3** Demonstrate the uses of different grades of fire protection systems related with different classes of fire.
- CO4** Develop Agronomical study of different work environment in industries.
- CO5** Discuss the importance of safety training and its impact on shop floor of factories.

CO / PO, PSO Mapping														
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
COs, POs PSOs Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO - 1	3	-	-	-	1	3	3	3	2	2	3	3	2	2
CO - 2	3	2	2	1	3	3	3	3	2	2	-	2	2	3
CO - 3	2	3	2	3	3	3	3	3	3	3	3	2	2	3
CO - 4	2	1	3	3	3	3	2	3	1	2	-	2	3	3
CO - 5	1	3	3	3	-	3	-	3	3	3	2	3	2	2

Unit I BASICS OF SAFETY ENGINEERING & ACTS

L 9 T 0

Evolution of modern safety concept –safety performance monitoring. Acts – factories act – 1948 – Statutory authorities – inspecting staff – Tamilnadu Factories Rules 1950 under Safety and health – environment act – 1986 – Air act 1981, water act 1974 – other acts. Safety in industries – General safety concepts, machine guarding, hazards in metal removing process, welding process, cold and hot working process.

Unit II OCCUPATIONAL HEALTH AND INDUSTRIAL HYGIENE

L 9 T 0

(Basic concepts, related hazards and exposure limits)

Physical Hazards – Noise, heat, radiation, vibration, recognition of chemical hazards-dust, fumes, mist, vapour, fog, gases. Biological and Ergonomical Hazards-Basic concepts. Occupational Health-Concept and spectrum of health – functional units and activities of occupational health services, pre-employment and post-employment medical examinations – occupational related diseases, levels of prevention of diseases, notifiable occupational diseases. Hazard assessment, procedure, methodology; safety audit, checklist analysis, what-if analysis, safety review, Preliminary Hazard Analysis (PHA), human error analysis, hazard operability studies (HAZOP), safety warning systems.

Unit III FIRE ENGINEERING AND EXPLOSIVE CONTROL

L 9 T 0

Fire properties of solid, liquid and gases – fire triangle – principles of fire extinguishing – active and passive fire protection systems – various classes of fires – A, B, C, D, E – types of fire extinguishers – Principles of explosion – Explosion Protection – Electrical Safety. Electrical Hazards – Primary and Secondary hazards – concept of earthing – protection systems – fuses, circuit breakers and over load relays – first aid cardiopulmonary resuscitation techniques.

Unit IV ERGONOMICS

L 9 T 0

Introduction to ergonomics: The focus of ergonomics, ergonomics and its areas of application in the work system, modern ergonomics, and future directions for ergonomics. Anatomy, Posture and Body Mechanics: anatomy of the spine and pelvis related to posture, posture stability and posture adaptation, low back pain, risk factors for musculoskeletal disorders in the workplace, effectiveness and cost effectiveness. Anthropometry and its uses in ergonomics, Applications of human factors engineering, man as a sensor, man as information processor, man as controller – Ergonomics in IT industries.

Unit V SAFETY EDUCATION AND TRAINING

L 9 T 0


Importance of training – identification of training needs – training methods – programs, seminars, conferences, competitions – motivation – communication – role of government agencies and private consulting agencies in safety training – creating awareness, awards, celebrations, safety posters, safety displays, safety pledge, safety incentive scheme, safety campaign – Domestic Safety Training.

Total Number of hours: 45**Learning Resources****Text Books**

1. Krishnan N.V., "Safety Management in Industry", Jaico Publishing House, Bombay, 1997.
2. Hand book of "Occupational Safety and Health", National Safety Council, Chicago, 1982.

Reference Books

1. Derek, James, "Fire Prevention Hand Book", Butter Worths and Company, London, 1986.
2. Guidelines for Hazard Evaluation Procedures Centre for Chemical Process Safety, AICHE 1992.
3. The factories Act 1948, Madras Book Agency, Chennai, 2000.
4. Introduction to Ergonomics, R.S. Bridger, Taylor & Francis.



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COURSE CODE U19ME1004

L T P C

COURSE NAME RENEWABLE ENERGY SOURCES

3 - - 3

Prerequisites- subject: Environmental Sciences.**Course Outcomes**

Upon completion of this course the students will be able to

- CO1** Discuss the power demand scenario in world level and impact of various renewable energy sources in satisfying power demand.
- CO2** Explain the different components and the principle of operation and the application of solar PV system and Bio Mass power generation system.
- CO3** Outline in the components and to find the suitability based on the performance of wind energy conversion system, geothermal and hydel power system.
- CO4** Describe the components of tidal power generation scheme and wave energy scheme and to discuss the performance of two schemes.
- CO5** Compare and contrast the various components and methods of Ocean Energy Conversion Systems.

CO / PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
COs, POs PSOs Mapping	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO - 1	3	3	3	-	3	3	3	2	3	3	2	3	3	3
CO - 2	3	-	3	3	3	3	3	-	3	3	3	3	3	3
CO - 3	3	3	3	2	3	3	3	-	3	3	3	3	3	3
CO - 4	3	3	3	2	3	3	3	-	3	3	2	3	3	3
CO - 5	3	2	3	3	3	3	3	2	3	3	2	3	3	3

Unit I INTRODUCTION

L 9 T 0

World energy use – reserves of energy resources – energy cycle of the earth – environmental aspects of energy Utilization – renewable energy resources and their importance.

Unit II SOLAR & BIO ENERGY

L 9 T 0

Introduction – extra-terrestrial solar radiation – radiation at ground level – collectors – solar cells – applications of solar energy – Biomass Energy – Introduction – Biomass Conversion – Biogas Production – Ethanol Production – Pyrolysis and Gasification – Direct Combustion – Applications.

Unit III GEO THERMAL AND HYDRO ENERGY SOURCES

L 9 T 0

Geothermal energy – types of geothermal energy sites, site selection, and geothermal power plants, Hydro energy – Feasibility of small, mini and micro hydro plants: scheme, layout and economics.

Unit IV WIND AND TIDAL ENERGY

L 9 T 0

Introduction – Wind Energy – Wind speed and power relation – Power extracted from wind – wind distribution and wind speed predictions – types of Wind power systems.

Introduction – origin of tides – power generation schemes – Wave Energy – basic theory – wave power Devices.

Unit V OTHER RENEWABLE ENERGY SOURCES

L 9 T 0


Introduction – Open and Closed OTEC cycles – Ocean Currents – Salinity Gradient Devices – Potential impacts of harnessing the different renewable energy resources.

Total Number of hours: 45**Learning Resources****Text Books**

1. Twidell John; Weir, Tony, "Renewable energy resources", Taylor & Francis, 2010
2. Godfrey Boyle, "Renewable energy – power for a sustainable future", Oxford University Press, 2010
3. Kothari DP, Singal KC and Rakesh Ranjan, 'Renewable Energy Sources and Emerging Technologies' PHI Learning Pvt. Ltd.2011.
4. S.A. Abbasi and Naseema Abbasi, "Renewable energy sources and their environmental impact", Prentice- Hall of India, 2001.

Reference Books

1. T.N.Veziroglu, Alternative Energy Sources, Vol 5 and 6, McGraw Hill, 1978.
2. G D Rai, "Non-conventional sources of energy", Khanna Publishers, 2002.
3. G D Rai, "Solar energy utilization", Khanna Publishers, 2005.
4. MukundR.Patel, "Wind and Solar Power Systems", CRC Press, Taylor and Francis, 2005.
5. Yogi Goswami, 'Principles of Solar Engineering' CRC Press, 2015, ISBN 10: 1466563788



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Syllabi for

**B.E/B.Tech Honours (Specialization in the
same Discipline)**

B.E/B.Tech Honours

B.E/B.Tech Minor

courses

COURSE OUTCOMES

At the end of the course, the students should be able to,

1. Describe about the basics of Jewellery designing and its techniques
2. Explain the different types of jewellery
3. Explore the jewellery manufacturing techniques
4. Analyse properties of gems
5. Create jewellery design using CAD application

COs	CO/PO, PSO Mapping														
	(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1			3	2	2		2			2		3	2	3	2
CO2			3	3		3	3	3		3	2	3	3	3	3
CO3			3	3		3	3	3		3	2	3	3	3	3
CO4		2	3		3					3	2	3	3	3	3
CO5			3	3		3	3	3		3	2	3	3	3	3

UNIT I BASICS OF JEWELLERY DESIGN

6

Introduction, History of art and jewellery, Significance of Indian jewellery, Elements of design and their application in jewellery design, Design foundation for jewellery, Rendering Techniques

UNIT II TYPES OF JEWELLERY

6

Material used, design features, and uniqueness of jewellery: Bridal jewellery, Antique jewellery, Bead jewellery, Custom jewellery, Copper jewellery, Fashion jewellery, Gold jewellery, Hand-made jewellery, Ivory jewellery, Jadu jewellery, Kundan jewellery, Lac jewellery, Meenakari jewellery, Navaratna jewellery, Silver jewellery, Stone jewellery, Temple jewellery, Tribal jewellery.

UNIT III JEWELLERY MANUFACTURING TECHNIQUES

6

Process of jewellery making, Designing, Moulding, Casting, Filling, Polishing, Embellishment, Finishing, Plating, Quality checking and Packing

UNIT IV GEMOLOGY

6

Introduction to gemology, Varieties of Gemstone, Properties of gemstone, Diamond grading, Setting of gemstones in jewellery, Manufacturing costume jewelry, Metallurgy and casting Process (design theory), Accessory design, Manufacturing process.

UNIT V JEWELLERY DESIGNING

5

Design theories and practices, Digital representation methods and Instruments for design, CAD/CAM in jewellery, its tools and designing of ring, neckpiece and bracelet design



22.12.2023

Dr. D. RAJA, M.Tech., Ph.D., 2019 Regulations - Honours
 Professor & Head
 Department of Fashion Technology
 Sona College of Technology
 Salem - 636 005, Tamil Nadu

LIST OF EXERCISES

1. Prepare Line drawing for an earring set, Neckpiece and Bangle
2. Prepare Analytical and measured drawing for an earring set, Neckpiece and Bangle
3. Prepare Design using CAD for an earring set, Neckpiece and Bangle
4. Design a set of bridal ornaments
5. Design a set of Kundan jewellery

Theory: 30 Hours Tutorial: - Practical: 30 Hours TOTAL: 60 Hours

TEXT BOOKS

1. William Grant, Andrew Grima: **“The Father of Modern Jewellery”**. ISBN 9781788841061, Mar 16, 2021.
2. Stellene Volandes, **“Jewels That Made History: 101 Stones, Myths, and Legends”**, ISBN 9780847868544, Jan 23, 2021
3. Eliania Rosetti, **“CAD Book Review – Designing Jewelry with Rhino”**, 28 January, 2017

REFERENCE

1. **“AJM guide to lost wax casting: techniques and tips form industry experts”**. MJSA/AJM Press, Providence, 2003
2. Brepohl, Erhard. **“The theory and practice of goldsmithing”**. Brynmorgen Press, Portland, ME.2001
3. Grether, P. A. **“The technology of setting”**. Editions AR, Switzerland. 1984


Dr. D. RAJA, M.Tech., Ph.D.,
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COURSE OUTCOMES

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

1. Describe about the types of leather materials, and its manufacturing techniques.
2. Explain the design principles of leatherwear and accessory designs.
3. Elaborate the leatherworking techniques to construct high-quality leatherwear items.
4. Analyze and select appropriate materials and hardware for leather wear and accessories production and its quality control.
5. Analyze and evaluate the business opportunities and challenges present in the leatherwear and accessories industry.

CO/PO, PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	2	3	1	2	2	-	2	3	1	3	1	3
CO2	2	3	2	3	3	1	2	2	1	2	3	1	2	2	3
CO3	2	3	3	3	1	1	-	-	-	2	3	1	3	2	1
CO4	2	3	2	3	3	1	-	1	-	2	3	1	3	2	2
CO5	3	3	2	3	3	1	-	-	-	2	3	1	2	2	2

UNIT I LEATHERWEAR AND ACCESSORIES 6

Introduction to leatherwear and accessories, history, significance, and cultural aspects. Types of leatherwear and accessories, Production sequence of leather: Objectives and machines used. Ethical and sustainable practices in leather production. Market trends and consumer preferences in the industry.

UNIT II DESIGN PRINCIPLES 6

Stages of leatherwear and accessories production, Design principles and their application in leatherwear and accessories, color, texture, shape and proportion in design, Sketching and prototyping leatherwear and accessory designs, Functionality and ergonomics in design.

UNIT III LEATHER WORKING TECHNIQUES 6

Basic leather working techniques: cutting, stitching, and edge finishing, Tools and equipment used in leather working, Construction procedure of leatherwear and accessories items (Jacket, pant, belts, wallets, bags). Surface embellishments: embossing and tooling.

UNIT IV PRODUCTION AND QUALITY CONTROL 6

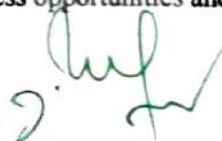
Stages of leatherwear and accessories production, Material and hardware selection for production, Quality control measures for durability and functionality. Identifying and resolving production issues, Ethical sourcing and sustainable practices in production.

UNIT V MARKETING AND BUSINESS CONSIDERATIONS 6

Target markets and customer segmentation for leatherwear and accessories, Marketing plans and promotional strategies for the industry, Pricing strategies and profit margins, Retail operations and distribution channels, Business opportunities and challenges in the industry.

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2019 Regulations - Honours

LIST OF EXPERIMENTS

1. Designing and construction of waist belt and wallet.
2. Designing and construction of hand bag and purses.
3. Designing and construction of gloves and mobile case.
4. Designing and construction of Pant.
5. Designing and construction of Jacket.

Theory: 30 Hours Tutorial: - Practical: 30 Hours TOTAL: 60 Hours

TEXT BOOKS

1. Christine Schmidt, "The Leather working Beginner's Handbook: Easy Techniques and Step-by-Step Projects", 2020
2. Bill Holman, "Leather working: Traditional Techniques and Contemporary Projects", 2014

REFERENCE BOOKS

1. Tony Laier, "The Art of Leatherwork: Projects and Techniques for the Modern Leather Artist", 2020
2. Valerie Michael, "The Leatherworking Handbook: A Practical Illustrated Sourcebook of Techniques and Projects", 2017
3. Sam Brown, "Leather Craft: Step-by-Step Techniques and Projects for Making Leather Goods", Year of Publication, 2019
4. Tony Laier, "Leatherworking Handbook: A Practical Guide to Making Leather Goods" 2019



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COURSE OUTCOMES

At the end of the study of this course the students will be able to,

1. Discuss the evolution and importance of logistics and supply chain.
2. Explain the influence of selection of transportation over supply chain management and packaging, warehousing and inventory controlling.
3. Describe the global supply chain and its relation in global economy.
4. Describe the information services in logistics and supply chain.
5. Elaborate the concept of emerging trends in supply chain management.

CO/PO, PSO Mapping															
(3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak															
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2								3	3	3	3	2	
CO2	2	2	1	2	1					3	3	1		2	
CO3	2	2		2	2							1		1	2
CO4	3	3			3	3						2		3	2
CO5	2				2	3	2					2	2	2	1

UNIT I Introduction to Logistics and Supply Chain management 9
Logistics: Logistics definition, evolution of logistics and supply chain, importance of logistics and supply chain, the concepts of logistics, logistics in apparel industries.
Supply Chain Management: Supply chain: definition, objectives, types, drivers of supply chain, need for SCM, fundamentals of supply chain and importance, development of SCM concepts supply chain strategy, strategic supply chain management and key components. Drivers of supply chain performance, key decision areas and external drivers of change.

UNIT II Transportation Selection 9
Transport Functionality: Modes of transportation, models for transportation and distribution, factors affecting network effectiveness.
International Air Transportation: Types of aircrafts, air cargo regulations, truck and rail transportation.
Packaging: Objectives, goods, customs duty, nontariff barriers, customs clearing process, international logistics infrastructure.
Material Storage : Material handling, order processing, information handling and procurement, transportation and packaging. Third party and fourth party logistics, reverse logistics, global logistics. warehousing and inventory controlling.

UNIT III Global Supply Chain 9
 Meaning and objectives, importance in global economy, characteristics of global supply chains, global supply chain integration, supply chain security, international sourcing, role of government in controlling international trade and its impact on logistics and supply chain, customer service, supply chain relationships, trade agreement policy of the developed/under developed countries/developing countries.

UNIT IV Information Services In Logistics and Supply Chain**9**

Importance, applications, information requirements, advanced order processing system in logistics, electronic data Interchange, decision support systems in logistics and database management. Intelligence information system – materials requirement planning, manufacturing resource planning and enterprise resource planning.

UNIT V Emerging Trends in Supply Chain Management**9**

Collaborative strategies, vendor managed inventory (VMI), third and fourth party logistics, green supply chain, reverse logistics. Case studies and discussion on leading apparel supply chains. Introduction to quantitative models – List of techniques and usage in SCM

TOTAL: 45 hours**TEXT BOOKS**

1. Harrison,A., and van Hoek, R., “**Logistics Management and Strategy**”, Harlow, Prentice Hall, 2011.
2. Sunil Chopra, Peter Meindl, “**Supply Chain Management - Strategy, Planning and Operations**”, Pearson Prentice Hall, New Jersey, 2007.
3. Douglas M Lambert, James R Stock, Lisa and M Ellram, “**Fundamentals of Logistics Management**”, McGraw Hill, Boston, 1998.

REFERENCE

1. Anon., “**The Physical Internet, A Survey of Logistics,**” The Economist, (June 17, 2006), pp. 3,18.
2. Laura R. Kopczak and M. Eric Johnson, “**The Supply Chain Management Effect**”, MIT SloanManagement Review, Vol. 44 No 3 (Spring 2003): 27,34.
3. Mohanty R.P, S.G Deshmuki, “**Supply Chain Management**”, Biztantra, New Delhi.
4. Benjamin S Blanchard, “**Logistics Engineering and Management**”, Prentice Hall India, New Delhi, 2005.
5. D K Agrawal, “**Textbook of Logistics and Supply Chain Management**”, Macmillan Publishers India limited, Kolkata, 2010.
6. Janat Shah, ‘**Supply Chain Management**’ Pearson education India, 2009.

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COURSE OUTCOMES

At the end of the study of the course, the student will be able to,

1. Apply & analyze quality concepts and philosophies of TQM
2. Apply concepts of continuous improvement
3. Apply TQM concepts to enhance customer satisfaction and deal with customer related aspects.
4. Apply and analyze the quality tools, management tools and statistical fundamentals to improve quality
5. Apply and analyze the TQM tools as a means to improve quality , procedure for implementation, documentation and auditing.

		CO/PO, PSO Mapping (3/2/1 indicates strength of correlation) 3-Strong, 2-Medium, 1-Weak														
COs	Programme Outcomes (POs) and Programme Specific Outcome (PSOs)															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
CO1	2	3	3	1		3	2					1	2	3	3	
CO2	3	3	3	2	3	3	1			2	3	2	3	3	3	
CO3	3	3	3	2	3	3	1			2	3	2	3	3	3	
CO4	3	3	3	2	3	3	1			2	3	2	3	3	3	
CO5	1	3	3	1	3	3	1			1		1	3	3	3	

UNIT I Introduction 9
Definition of Quality, Dimensions of Quality, Quality costs, Top Management Commitment, Quality Council, Quality Statements, Barriers to TQM Implementation, Contributions of Deming, Juran and Crosby, Team Balancing

UNIT II TQM Principles 9
Customer satisfaction – Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Continuous Process Improvement, 5S, Kaizen, Just-In-Time and TPS

UNIT III Statistical Process Control 9
The seven tools of quality, New seven Management tools, Statistical Fundamentals – Measures of central Tendency and Dispersion, Population and Sample, Normal Curve, Control Charts for variables and attributes, Concept of six sigma.

UNIT IV TQM Tools 9
Quality Policy Deployment (QPD), Quality Function Deployment (QFD), Benchmarking, Taguchi Quality Loss Function, Total Productive Maintenance (TPM), FMEA

UNIT V Quality Systems 9
Need for ISO 9000 and Other Quality Systems, ISO 9001:2008 Quality System – Elements, Implementation of Quality System, Documentation, Quality Auditing, ISO 14001:2004

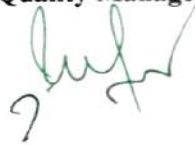
Total: 45 Hours

TEXT BOOKS

1. Zeiri, "**Total Quality Management for Engineers**", Wood Head Publishers, 1991.

REFERENCES

1. Dale H. Besterfield, "**Total Quality Management**", Pearson Education, 2011.
2. James R. Evans & William M. Lindsay, "**The Management and Control of Quality**", South-Western (Thomson Learning), 2008.
3. Feigenbaum. A. V. "**Total Quality Management**", McGraw Hill, 1991.
4. Oakland. J. S. "**Total Quality Management**", Butterworth – Heinemann Ltd., Oxford, 1989.
5. Bhaskar S. "**Total Quality Management**", (2007-revised edition) Anuradha Agencies, Chennai
6. Narayana V. and Sreenivasan, N.S. "**Quality Management – Concepts and Tasks**", New Age International, 2007.



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