K.S. Rangasamy College of Technology

(Autonomous)

Curriculum & Syllabus

of

B.Tech. Textile Technology

(For the batch admitted in 2020 – 2024)

R 2018 (CBCS)

Courses Accredited by NBA, Accredited by NAAC A++ Grade,
Approved by AICTE, Affiliated to Anna University, Chennai.

KSR Kalvi Nagar, Tiruchengode – 637 215.
Namakkal District, Tamil Nadu, India.

TEXTILE TECHNOLOGY

VISION OF THE DEPARTMENT

To be the centre of excellence in textile education, training, research and service.

MISSION OF THE DEPARTMENT

- To enlighten the students about the latest technology in textile industries through innovative educational practices and multi-disciplinary approach.
- To engage with the industry as solution providers through consultancy.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO1: **Production Process and Solutions to Problems**: Graduates are competent in textile production processes and be able to identify problems and suggest suitable solutions.

PEO2: **Modern Tools & Technology and Ethics**: Graduates use latest tools and technology for the production of textile materials and serve society in an ethical manner.

PEO3: **Skills, Entrepreneurship and Life Long Learning**: Graduates will exhibit skills in their career and develop entrepreneurial culture through life-long learning.

PROGRAMME OUTCOMES (POs)

Engineering Graduates will be able to:

PO1: **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: **Design /development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations

PO6: **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

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PO11: **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

Engineering Graduates will be able to:

PSO1: **Application of Basic Concepts**: Apply fundamental concepts in the areas of spinning, weaving, testing, garment making and processing.

PSO2: **Solution for Industrial Problems**: Solve industrial problems in textile industries considering environmental issues to improve quality and productivity.

PSO3: **Moral Values**: Demonstrate social and ethical responsibilities relevant to textile industries.

MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES (PEOs) WITH PROGRAMME OUTCOMES (POs)

Programme Educational Objectives	Programme Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
PEO 1	3	3	3	3	3	2	2	1	3	2	3	2
PEO 2	2	2	3	2	3	2	2	3	2	2	2	2
PEO 3	3	2	2	2	2	2	1	1	3	2	3	3

Contributions: 1- Low, 2- Medium, 3- High

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MAPPING – UG -TEXTILE TECHNOLOGY

Year	Sem	Subject Name	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
I	I	Communication Skills I	1	1	1	1	1	2	1	2	3	3	2	3	1	1	2
		Calculus and Differential Equations	3	3	3	2	2							2	3		
		Applied Physics for Textile	3	3	3	2	3	3	2	2	2	2	1	1	3	1	2
		Programming for Problem Solving	1	3		2	3			2				2	3	2	
		Engineering Drawing	3	3	3	3	3	1		1		3	1	1	3	2	1
		Constitution of India								2	2	1		2			2
		Engineering Physics laboratory	3	3	2	2	2	2	2	1	1	1	1	1	2	2	1
		Programming for Problem solving Laboratory	1	3		2	3			2				2	1	1	
		IDEA Laboratory															
	II	Communication Skills II	1	2	1	2	1	2	1	2	3	3	2	3	1	1	2
		Laplace Transform and Complex Variables	3	3	2	3	3							2	3		
		Applied Chemistry	3	3	3	3	2	2	3	2	2	1	1	2	2	3	3
		Basic Electrical Engineering	3	3	1	1	2	1	1	1	1	1	2	2	3	2	
		Engineering Mechanics	3	2	2	3								2	3	1	2
		Environmental Science	3	3	3	3	2	3	3	3	3	3	2	2	2	2	2
		Chemistry Laboratory	3	3	3	3	3	3	2	2	2		2	1	2	3	2
		Engineering Practices Laboratory	3	2	2	1	3	2	2	3	1	2	2	1	3	1	2
II	III	Elements of Mechanical Engineering	3	3	3	3	3	2	2	1	3	2	3	2	3		1
		Chemistry for Textile	3	3	3	3	3	3	3	3	2	2	3	2	3	3	3
		Fibre Science	2	2	2		3	1	2		3	1		1	2		1
		Structure and Properties of Fibers	3	2	1	2	2		1			2		1	2	1	
		Yarn Manufacturing Technology I	3	2	1	1		2	1		2	1	2		2	3	
		Fabric Manufacturing Technology I	2		3	2	1	3	3		3	1		1	2	2	
		Fibre Science Laboratory	2	3	2	1						1		1			1
		Yarn Manufacturing Technology Laboratory I	3	2	1								2	3	2		
		Career Competency Development I	1	1	1	1	1	2	1	2	3	3	2	3	2	1	3
	IV	Statistics for Textile	3	3	3	3	2	3	2				2	2	3	3	2

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		Industry															
		Yarn Manufacturing Technology II	3	2	1								3		2	1	
		Fabric Manufacturing Technology II	3	2	1`	1		2				1			2	2	
		Textile Chemical Processing I	3	3	2	3	1				1	1			3	2	
		Open Elective I															
		Start-ups and Entrepreneurship	3	2	3	2	2	2	2	2	1	1	2	3	3	1	
		Universal Human Values	3	3	2	2	2	3	3	3	3	3	2	1			
		National Cadet Corps (Air Wing)	3	2	1	1	3	3	3	3	3	3	3	3			
		National Cadet Corps (Army Wing)						1		3							
		Yarn Manufacturing Technology Laboratory II	3	2	1								2		2	3	
		Fabric Manufacturing Technology Laboratory	3	3	2	2		3			2	1	3		1	1	
		Career Competency Development II	2	2	1	1	1	2	1	1	2	3	2	3	2	2	2
III	V	Operations Research	3	3	3	3	2	3	2		3		3	2	3	2	2
		Knitting Technology	3	2	1	1							2	1	3	2	
		Textile Chemical Processing II	3	1	2		1	1	1			2		1	3	2	
		Woven Fabric Structure	3	3	2										3	2	
		Open Elective II															
		Elective I															
		Textile Chemical Processing Laboratory	3	1	1	2	2				2		2		3	2	
		Fabric Structure Laboratory	3	3	1		1							2	3	2	
		Career Competency Development III	2	1	2	2	1	1	1	1	2	3	2	3	1	2	1
	VI	Textile and Apparel Quality Evaluation	3	3	2	3	2			1	2	2		2	2	2	
		Garment Manufacturing Technology I	3	2	3	2	1	3	3	1	3	1	1	1	2	1	1
		Nonwoven Technology	2		2		1					1	1		2	1	
		Technical Textiles	3	2	3	1	3		1		1	1		2	2	1	
		Open Elective III															
		Elective II															
		Garment Construction Laboratory I	3	3	2	1	2	3	1	1	3	1	3	2	3	2	1
		Textile and Apparel Quality Evaluation Laboratory	3	3	2	3	2			2	1	2		2		2	2
		Career Competency	2	1	2	2	1	2	1	1	2	3	2	3	2	1	1

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		Development IV															
IV	VII	Total Quality Management	3	2	3	2	1	3	2	1	2	2	3	2	2	2	2
		Garment Manufacturing Technology II	3	3	1	1	1	1	1	1	1	1	1	1	2	1	1
		Financial Management and Costing for Textile and Apparel Industry	2	2	1	3	2				1		2	2	2	3	
		Open Elective IV															
		Elective III															
		Elective IV															
		Research Skill Development I	3	3	2	2	2	2	1	2	1	3	2	1	2	3	1
		Textile CAD Laboratory	2		2	1	3							2	2	3	
		Garment Construction Laboratory II	3	3	2	1	2	1	2	1	1	1	1	1	2	2	1
		Project Work – I	3	3	2	3	2			2	2	2	1		3	2	1
		Internship	3	2	2	2	2	2				2	2		3	2	
		Career Competency Development V	2	1	2	2	1	2	1	1	2	3	2	3	2	1	1
	VIII	Elective V															
		Research Skill Development II	3	3	3	2	2	2	1	1	1	2	2	1	2	3	1
		Project Work – II	3	3	2	3	2			2	2	2	1	2	3	2	1

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SEMESTER I

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
INDUCTION PROGRAM								
THEORY								
1.	50 EN 001	Communication Skills I	HS	2	1	1	0	2
2.	50 MA 001	Calculus and Differential Equations	BS	4	3	1	0	4
3.	50 PH 005	Applied Physics for Textile	BS	3	3	0	0	3
4.	50 CS 001	Programming for Problem Solving	ES	3	3	0	0	3
5.	50 ME 001	Engineering Drawing	ES	6	2	0	4	4
6.	50 MY 001	Constitution of India	MC	2	2	0	0	-
PRACTICALS								
7.	50 PH 0P1	Engineering Physics laboratory	BS	4	0	0	4	2
8.	50 CS 0P1	Programming for Problem solving Laboratory	ES	4	0	0	4	2
9.	50 TP 0P7	IDEA Laboratory	ES	2	0	0	2	1*
			Total	**30**	**14**	**2**	**14**	**20**

*** Extra credit is offered.**

SEMESTER II

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
THEORY								
1.	50 EN 002	Communication Skills II	HS	2	1	1	0	2
2.	50 MA 002	Laplace Transform and Complex Variables	BS	4	3	1	0	4
3.	50 CH 001	Applied Chemistry	BS	3	3	0	0	3
4.	50 EE 001	Basic Electrical Engineering	ES	3	3	0	0	3
5.	50 ME 003	Engineering Mechanics	ES	4	3	1	0	4
6.	50 MY 002	Environmental Science	MC	2	2	0	0	-
PRACTICALS								
7.	50 CH 0P1	Chemistry Laboratory	BS	4	0	0	4	2
8.	50 ME 0P1	Engineering Practices Laboratory	ES	4	0	0	4	2
			Total	**26**	**15**	**3**	**8**	**20**

SEMESTER III

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
THEORY								
1.	50 ME 008	Elements of Mechanical Engineering	ES	4	3	1	0	4
2.	50 CH 002	Chemistry for Textile	BS	3	3	0	0	3
3.	50 TT 301	Fibre Science	PC	3	3	0	0	3
4.	50 TT 302	Structure and Properties of Fibers	PC	4	4	0	0	4
5.	50 TT 303	Yarn Manufacturing Technology I	PC	3	3	0	0	3
6.	50 TT 304	Fabric Manufacturing Technology I	PC	3	3	0	0	3
PRACTICALS								
7.	50 TT 3P1	Fibre Science Laboratory	PC	4	0	0	4	2

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8.	50 TT 3P2	Yarn Manufacturing Technology Laboratory I	PC	4	0	0	4	2
9.	50 TP 0P1	Career Competency Development I	EEC	2	0	0	2	0
			Total	**30**	**19**	**1**	**10**	**24**

SEMESTER IV

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
THEORY								
1.	50 MA 012	Statistics for Textile Industry	BS	4	3	1	0	4
2.	50 TT 401	Yarn Manufacturing Technology II	PC	3	3	0	0	3
3.	50 TT 402	Fabric Manufacturing Technology II	PC	3	3	0	0	3
4.	50 TT 403	Textile Chemical Processing I	PC	3	3	0	0	3
5.	50 ** L1*	Open Elective I	OE	3	3	0	0	3
6.	50 MY 014	Start-ups and Entrepreneurship	MC	2	2	0	0	-
7.	50 MY 004	Universal Human Values	MC	3	2	1	0	3*
8.	50 GE 00*	National Cadet Corps	GE	5	3	0	2	4$
PRACTICALS								
9.	50 TT 4P1	Yarn Manufacturing Technology Laboratory II	PC	4	0	0	4	2
10.	50 TT 4P2	Fabric Manufacturing Technology Laboratory	PC	4	0	0	4	2
11.	50 TP 0P2	Career Competency Development II	EEC	2	0	0	2	0
			Total	**31**	**19**	**2**	**10**	**20**

*** UHV extra credit is offered. $NCC is optional, extra credit is offered.**

SEMESTER V

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
THEORY								
1.	50 MA 015	Operations Research	BS	4	3	1	0	4
2.	51 TT 501	Knitting Technology	PC	3	3	0	0	3
3.	51 TT 502	Textile Chemical Processing II	PC	3	3	0	0	3
4.	50 TT 503	Woven Fabric Structure	PC	3	3	0	0	3
5.	50 ** L2*	Open Elective II	OE	3	3	0	0	3
6.	50 TT E1*	Elective I	PE	3	3	0	0	3
PRACTICALS								
7.	50 TT 5P1	Textile Chemical Processing Laboratory	PC	4	0	0	4	2
8.	50 TT 5P2	Fabric Structure Laboratory	PC	4	0	0	4	2
9.	50 TP 0P3	Career Competency Development III	EEC	2	0	0	2	0
			Total	**29**	**18**	**1**	**10**	**23**

SEMESTER VI

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
THEORY								
1.	51 TT 601	Textile and Apparel Quality Evaluation	PC	3	3	0	0	3
2.	51 TT 602	Garment Manufacturing Technology I	PC	3	3	0	0	3
3.	50 TT 603	Nonwoven Technology	PC	3	3	0	0	3
4.	51 TT 604	Technical Textiles	PC	3	3	0	0	3
5.	50 ** L3*	Open Elective III	OE	3	3	0	0	3

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6.	50 TT E2*	Elective II	PE	3	3	0	0	3
PRACTICALS								
7.	50 TT 6P1	Garment Construction Laboratory I	PC	4	0	0	4	2
8.	50 TT 6P2	Textile and Apparel Quality Evaluation Laboratory	PC	4	0	0	4	2
9.	50 TP 0P4	Career Competency Development IV	EEC	2	0	0	2	0
			Total	**28**	**18**	**0**	**10**	**22**

SEMESTER VII

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
THEORY								
1.	50 HS 003	Total Quality Management	HS	3	3	0	0	3
2.	51 TT 701	Garment Manufacturing Technology II	PC	3	3	0	0	3
3.	50 TT 702	Financial Management and Costing for Textile and Apparel Industry	PC	3	3	0	0	3
4.	50 ** L4*	Open Elective IV	OE	3	3	0	0	3
5.	50 TT E3*	Elective III	PE	3	3	0	0	3
6.	50 TT E4*	Elective IV	PE	3	3	0	0	3
7.	50 AC 001	Research Skill Development - I	AC	1	1	0	0	-
PRACTICALS								
8.	51 TT 7P1	Textile CAD Laboratory	PC	4	0	0	4	2
9.	51 TT 7P2	Garment Construction Laboratory II	PC	4	0	0	4	2
10.	50 TT 7P3	Project Work – I	EEC	4	0	0	4	2
11.	50 TT 0P6	Internship*****	EEC	0	0	0	0	2
12.	50 TP 0P5	Career Competency Development V	EEC	2	0	0	2	0
			Total	**33**	**19**	**0**	**14**	**26**
*** Extra credits will be offered as additional credits depending on the duration of the internship**								

SEMESTER VIII

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
THEORY								
1.	50 TT E5*	Elective V	PE	3	3	0	0	3
2.	50 AC 002	Research Skill Development - II	AC	1	1	0	0	-
PRACTICALS								
3.	50 TT 8P1	Project Work – II	EEC	16	0	0	16	8
			Total	**20**	**4**	**0**	**16**	**11**

TOTAL NUMBER OF CREDITS TO BE EARNED FOR AWARD OF THE DEGREE = 166

Note: HS- Humanities and Social Sciences including Management Courses, BS- Basic Science Courses, ES-Engineering Science Courses, PE-Professional Core Courses, PE-Professional Elective Courses, OE- Open Elective Courses, EEC-Employability Enhancement Courses & MC- Mandatory Courses, AC- Audit Courses, GE-General Elective Courses

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HUMANITIES AND SOCIAL SCIENCE COURSES (HS)

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	50 EN 001	Communication Skills I	HS	2	1	1	0	2
2.	50 EN 002	Communication Skills II	HS	2	1	1	0	2
3.	50 HS 003	Total Quality Management	HS	3	3	0	0	3

BASIC SCIENCE COURSES (BS)

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	50 MA 001	Calculus and Differential Equations	BS	4	3	1	0	4
2.	50 PH 005	Applied Physics for Textile	BS	3	3	0	0	3
3.	50 PH 0P1	Engineering Physics Laboratory	BS	4	0	0	4	2
4.	50 MA 002	Laplace Transform and Complex Variables	BS	4	3	1	0	4
5.	50 CH 001	Applied Chemistry	BS	3	3	0	0	3
6.	50 CH 0P1	Chemistry Laboratory	BS	4	0	0	4	2
7.	50 CH 002	Chemistry for Textile	BS	3	3	0	0	3
8.	50 MA 012	Statistics for Textile Industry	BS	4	3	1	0	4
9.	50 MA 015	Operations Research	BS	4	3	1	0	4

ENGINEERING SCIENCE COUESES (ES)

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	50 CS 001	Programming For Problem Solving	ES	3	3	0	0	3
2.	50 ME 001	Engineering Drawing	ES	6	2	0	4	4
3.	50 CS 0P1	Programming for Problem Solving Laboratory	ES	4	0	0	4	2
4.	50 EE 001	Basic Electrical Engineering	ES	3	3	0	0	3
5.	50 ME 003	Engineering Mechanics	ES	4	3	1	0	4
6.	50 ME 0P1	Engineering Practices Laboratory	ES	4	0	0	4	2
7.	50 ME 008	Elements of Mechanical Engineering	ES	4	3	1	0	4

PROFESSIONAL CORE COURSES (PC)

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	50 TT 301	Fibre Science	PC	3	3	0	0	3
2.	50 TT 302	Structure and Properties of Fibers	PC	4	4	0	0	4
3.	50 TT 303	Yarn Manufacturing Technology I	PC	3	3	0	0	3
4.	50 TT 304	Fabric Manufacturing Technology I	PC	3	0	0	0	3
5.	50 TT 3P1	Fibre Science Laboratory	PC	4	0	0	4	2
6.	50 TT 3P2	Yarn Manufacturing Technology Laboratory I	PC	4	0	0	4	2
7.	50 TT 401	Yarn Manufacturing Technology II	PC	3	3	0	0	3

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8.	50 TT 402	Fabric Manufacturing Technology II	PC	3	3	0	0	3
9.	50 TT 403	Textile Chemical Processing I	PC	3	3	0	0	3
10.	50 TT 4P1	Yarn Manufacturing Technology Laboratory II	PC	4	0	0	4	2
11.	50 TT 4P2	Fabric Manufacturing Technology Laboratory	PC	4	0	0	4	2
12.	51 TT 501	Knitting Technology	PC	3	0	0	0	3
13.	51 TT 502	Textile Chemical Processing II	PC	3	3	0	0	3
14.	50 TT 503	Woven Fabric Structure	PC	3	3	0	0	3
15.	50 TT 5P1	Textile Chemical Processing Laboratory	PC	4	0	0	4	2
16.	50 TT 5P2	Fabric Structure Laboratory	PC	4	0	0	4	2
17.	51 TT 601	Textile and Apparel Quality Evaluation	PC	3	3	0	0	3
18.	51 TT 602	Garment Manufacturing Technology I	PC	3	3	0	0	3
19.	50 TT 603	Nonwoven Technology	PC	3	3	0	0	3
20.	51 TT 604	Technical Textiles	PC	3	3	0	0	3
21.	50 TT 6P1	Garment Construction Laboratory I	PC	4	0	0	4	2
22.	50 TT 6P2	Textile and Apparel Quality Evaluation Laboratory	PC	4	0	0	4	2
23.	51 TT 701	Garment Manufacturing Technology II	PC	3	0	0	0	3
24.	50 TT 702	Financial Management and Costing for Textile and Apparel Industry	PC	3	3	0	0	3
25.	51 TT 7P1	Textile CAD Laboratory	PC	4	0	0	4	2
26.	51 TT 7P2	Garment Construction Laboratory II	PC	4	0	0	4	2

PROFESSIONAL ELECTIVE COURSES (PE)

SEMESTER V, ELECTIVE I

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	50 TT E 11	High Performance Fibres	PE	3	3	0	0	3
2.	50 TT E 12	Man Made Fibre Technology	PE	3	3	0	0	3
3.	50 TT E 13	Textured Yarn Technology	PE	3	3	0	0	3
4.	50 TT E 14	Process Control In Spinning	PE	3	3	0	0	3
5.	51 TT E 15	Home Textiles	PE	3	3	0	0	3

SEMESTER VI, ELECTIVE II

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	50 TT E 21	Theory of Textile Structures	PE	3	3	0	0	3
2.	50 TT E 22	Process Control In Weaving and Chemical Processing	PE	3	3	0	0	3
3.	50 TT E 23	Protective Textiles	PE	3	3	0	0	3
4.	50 TT E 24	Medical Textiles	PE	3	3	0	0	3
5.	50 TT E 25	Apparel Marketing and Merchandising	PE	3	3	0	0	3

SEMESTER VII, ELECTIVE III

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	50 TT E 31	Textile Mechanics	PE	3	3	0	0	3
2.	50 TT E 32	Smart Textiles	PE	3	3	0	0	3
3.	50 TT E 33	Sustainable Textiles	PE	3	3	0	0	3
4.	50 TT E 34	Production and Operations Management	PE	3	3	0	0	3
5.	50 TT E 35	Export Policies and Documentation	PE	3	3	0	0	3

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SEMESTER VII, ELECTIVE IV

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	50 TT E 41	Clothing Science	PE	4	2	0	2	3
2.	50 TT E 42	Apparel Production Planning and Control	PE	4	2	0	2	3
3.	50 TT E 43	Industrial Engineering in Textile and Clothing Industry	PE	4	2	0	2	3
4.	50 TT E 44	Apparel Processing and Clothing Care	PE	4	2	0	2	3
5.	50 TT E 45	Apparel Production Machinery and Equipment	PE	4	2	0	2	3

SEMESTER VIII, ELECTIVE V

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	50 TT E 51	Textile Industry and Mill Management	PE	3	3	0	0	3
2.	50 TT E 52	Textile and Apparel Entrepreneurship	PE	3	3	0	0	3
3.	50 TT E 53	Lean and Six Sigma Concepts for Textile and Apparel Industry	PE	3	3	0	0	3
4.	50 TT E 54	Supply Chain Management for Textile and Apparel Industry	PE	3	3	0	0	3
5.	50 TT E 55	International Social Compliance	PE	3	3	0	0	3

GENERAL ELECTIVE COURSE (GE)

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	50 GE 001	National Cadet Corps (Air Wing)	GE	4	3	0	2	4
2.	50 GE 002	National Cadet Corps (Army Wing)	GE	4	3	0	2	4

AUDIT COURSES (AC)

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
3.	50 AC 001	Research Skill Development - I	AC	1	1	0	0	-
4.	50 AC 002	Research Skill Development - II	AC	1	1	0	0	-

OPEN ELECTIVE COURSES I/II/III/IV (OE)

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	50 TT L01	Fibre Science and Technology	OE	3	3	0	0	3
2.	50 TT L02	Basics of Textile Technology	OE	3	3	0	0	3
3.	50 TT L03	Introduction to Fashion Design	OE	3	3	0	0	3
4.	50 TT L04	Industrial Textiles	OE	3	3	0	0	3

EMPLOYABILITY ENHANCEMENT COURSES (EEC)

S.No.	Course Code	Course Title	Category	Contact Periods	L	T	P	C
1.	50 TP 0P1	Career Competency Development I	EEC	2	2	0	0	-
2.	50 TP 0P2	Career Competency Development II	EEC	2	2	0	0	-
3.	50 TP 0P3	Career Competency Development III	EEC	2	2	0	0	-
4.	50 TP 0P4	Career Competency Development IV	EEC	2	2	0	0	-
5.	50 TP 0P5	Career Competency Development V	EEC	2	2	0	0	-
6.	50 TT 7P3	Project Work – I	EEC	4	0	0	4	2
7.	50 TP 0P6	Internship	EEC	0	0	0	0	2
8.	50 TT 8P1	Project Work – II	EEC	16	0	0	16	8

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SUMMARY

S.No.	Category	Credits Per Semester								Total Credits	Percentage (%)
		I	II	III	IV	V	VI	VII	VIII		
1.	HS	2	2	-	-	-	-	3	-	**07**	**04.22**
2.	BS	9	9	3	4	4	-	-	-	**29**	**17.47**
3.	ES	9 + 1*	9	4	-	-	-	-	-	**22**	**13.25**
4.	PC	-	-	17	13	13	16	10	-	**69**	**41.57**
5.	PE	-	-	-	-	3	3	6	3	**15**	**09.04**
6.	OE	-	-	-	3	3	3	3	-	**12**	**07.23**
7.	EEC	-	-	-	-	-	-	4	8	**12**	**07.23**
8.	MC	0	0	-	3*	-	-	-	-	**-**	**0**
9.	AC	-	-	-	-	-	-	0	0	**-**	**0**
Total		**20**	**20**	**24**	**20**	**23**	**22**	**26**	**11**	**166**	**100**

*** - Extra Credits**

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K.S.Rangasamy College of Technology – Autonomous								R2018
50 EN 001 – Communication Skills I								
Common to all Branches								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	1	1	0	30	2	50	50	100

Objective(s)	• To help learners improve their vocabulary and to enable them to use words appropriately in different academic and professional contexts. • To help learners develop strategies that could be adopted while reading texts. • To help learners acquire the ability to speak effectively in English in real life and career related situations. • To equip students with effective speaking and listening skills in English. • To facilitate learners to enhance their writing skills with coherence and appropriate format effectively.
Course Outcomes	**At the end of the course, students will be able to** 1. Utilize digital literacy tools to develop listening skills & make use of contextual clues to infer meanings of unfamiliar words 2. Able to select, compile & synthesize information using communication strategies for an effective oral presentation 3. Skim & Scan the textual content & infer meanings of unfamiliar words to develop reading & vocabulary skills 4. Generate ideas from sources to develop coherent content and support with relevant details in writing 5. Recognize the basic phonetic patterns of language & execute it for competent loud reading

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Listening

Listening to Short Audios – Watching Short Videos - answering MCQs and Vocabulary Check- Listening to Short Comprehension Passages – Guided Listening – Listening to songs and cognizing the lyrics [4]

Speaking

Brainstorming – Group Discussion (unstructured) – Self Introduction - Just a Minute (JaM) - Short Narratives – Cue Cards – Picture Cards – Conversational Practices (Preliminary) [4]

Reading

Silent Reading – Scanning and Skimming - Reading short and Medium Passages – Cognition of Theme and Inferential Meaning - Academic and Functional Vocabulary List (350 words) – Word Power Check - Loud Reading – Modulation and Pronunciation Check [4]

Writing

Functional Vocabulary and Word Power – Data Interpretation - Paragraph Writing – Letter Writing –Email Writing – Conversational Fill Ups [3]

Lecture Hours: 15 Tutorial hours: 15 Total Hours: 30

Text Book(s):

1.	M.Ashraf Rizvi, 'Effective Technical Communication', 2nd Edition, McGraw Hill Education (India) Private Limited, Chennai, 2018
2.	Norman Lewis, 'Word Power Made Easy - The Complete Handbook for Building a Superior Vocabulary Book', Penguin Random House India, 2020

Reference(s):

1.	Paul Emmerson and Nick Hamilton , 'Five Minute Activities for Business English', Cambridge University Press, N.York, 2005
2.	Arthur Brookes and Peter Grundy ,' Beginning to Write: Writing Activities for Elementary and Intermediate Learners', Cambridge University Press, N.York, 2003
3.	Michael McCarthy and Felicity O Dell , 'English Vocabulary in Use: Upper Intermediate', Cambridge University Press, N.York, 2012
4.	https://learningenglish.britishcouncil.org/en/listening

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50 EN 001 – Communication Skills I															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	1	1		1	1	1	1	2	3	3	2	3	1		2
CO2	1	1		3	2	1		2	3	3	3	3	1	2	2
CO3	1	2	1	2	1	1	2	1	2	3	2	3	1	1	2
CO4	1	2	1	1	2	2	1	2	1	3	3	3	1	1	1
CO5	1	1		1	1	1	1	1	3	3	1	3			1

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K.S.Rangasamy College of Technology – Autonomous								R2018
50 MA 001 - Calculus and Differential Equations								
Common to All Branches								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	3	1	0	60	4	50	50	100

Objective(s)	• The goal of this course is to achieve conceptual understanding and to retain the best traditions of traditional calculus. • The syllabus is designed to provide the basic tools of calculus mainly for the purpose of modeling the engineering problems mathematically and obtaining solutions. • Matrix Algebra is one of the powerful tools to handle practical problems arising in the field of engineering. • This course deals with topics such as single variable and multivariable calculus and plays an important role in the understanding of science, engineering, economics and computer science, among other disciplines. • Development of mathematical skills to solve the differential equations.
Course Outcomes	**At the end of the course, the students will be able to** 1. Apply Cayley - Hamilton theorem to find inverse matrix and transformation techniques to reduce quadratic form into canonical form. 2. Determine the circle of curvature, evolute and envelope of the curves. 3. Analyze the Jacobian methods and the constrained maxima and minima function. 4. Solve the linear and simultaneous differential equations. 5. Evaluate definite and indefinite integrals using different techniques.

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Matrices

Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of Eigen values and Eigen vectors – Cayley-Hamilton theorem (without proof) – Orthogonal transformation of a symmetric matrix to diagonal form – Reduction of quadratic form to canonical form by orthogonal transformation - Nature of quadratic form. [8]

Differential Calculus

Curvature – radius of curvature (Cartesian and polar co-ordinates) – Centre of curvature – Circle of curvature – Involute and evolute – envelope. [9]

Functions of Several Variables

Partial differentiation – Homogeneous functions and Euler's theorem – Jacobians – Taylor's series for functions of two variables – Maxima and minima of functions of two variables – Constrained maxima and minima : Lagrange's Method of Undetermined Multipliers. [9]

Differential Equations

Linear differential equations of second and higher order with constant co-efficient - R.H.S is $e^{\alpha x}$, $\sin \alpha x, \cos \alpha x, x^n\, n > 0$, $e^{\alpha x} \sin \beta x$, $e^{\alpha x} \cos \beta x$, $e^{\alpha x} x^n$, $x^n \sin \alpha x$ and $x^n \cos \alpha x$ – Differential equations with variable co-efficients : Cauchy's and Legendre's form of linear equation – Method of variation of parameters – Simultaneous first-order linear equations with constant co-efficients. [9]

Integral Calculus

Definite and Indefinite integrals - Substitution rule - Techniques of Integration - Integration by parts, Trigonometric integrals, Trigonometric substitutions, Integration of rational functions by partial fraction, Integration of irrational functions - Improper integrals. [10]

Lecture Hours:45, Tutorial Hours:15, Total Hours: 60

Text book(s):

1.	Grewal B.S, "Higher Engineering Mathematics", 43rd Edition, Khanna Publishers, Delhi, 2014. Web site: https://pvpsitrealm.blogspot.com/2016/09/higher-engineering-mathematics-by-bs.html
2.	Veerarajan.T., "Engineering Mathematics", for Semesters I and II , Tata McGraw Hill Publishing Co., New Delhi., 2010.

Reference(s):

1.	Kreyszig Erwin, "Advanced Engineering Mathematics", 10th Edition, John Wiley and Sons (Asia) Limited, New Delhi, 2016.
2.	Dr. P.N. Agrawal and Dr. D.N Pandey,"Integral equations, calculus of variations and its applications", NPTEL online video courses.
3.	Dr. S.K. Gupta and Dr.Sanjeev Kumar, "Matrix Analysis with Applications" and Prof. Somnath Roy "Matrix Solvers", NPTEL online video courses.
4.	Dr. P. Kandasamy, Dr.K. Thilagavathy and Dr. K. Gunavathy, "Engineering Mathematics - II", S.Chand & Company Ltd, New Delhi.

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50 MA 001 - Calculus and Differential Equations															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	3							2	3		
CO2	3	3	2	2	2							2	3		
CO3	3	3	3	2	2							2	3		
CO4	3	3	3	3	2							2	3		
CO5	3	3	3	2	3							2	3		

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K.S.Rangasamy College of Technology – Autonomous								R2018
50 PH 005 - Applied Physics for Textile								
B.Tech Textile Technology								
Semester	Hours/week				Credit	Maximum marks		
	L	T	P	Total hrs	C	CA	ES	Total
I	3	0	0	45	3	50	50	100
Objective(s)	• To Explain the principles of laser, types of laser and demonstrate the applications of laser • To state the principle of optical fiber and to understand the design and applications of optical fibers • To study the basics of ultrasonic's, production of ultrasonic waves and non destructive techniques • To understand the theory of the surface tension of liquids and correlate the property of surface tension with different natural phenomena. • To enrich the understanding of advanced materials and nanotechnology for their applications in engineering and technology							
Course Outcomes	**At the end of the course, Students will be able to** 1. Know the basic idea about classification of lasers with applications. 2. Explain the propagation of lights in fibre optics and communication link and its applications. 3. Gives explanation for production, detection of ultrasonic waves and its applications. 4. Have the knowledge and apply the properties of surface tension, viscosity and friction. 5. Gain a broad view of smart materials and nano materials.							

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Lasers

Einstein's theory of matter radiation interaction and A and B coefficients; amplification of light by population inversion-different types of lasers: gas lasers (CO_2), solid-state lasers (Nd: YAG), dye lasers, Semiconductor laser (Homojunction and Hetero junction)-Properties of laser beams-applications of lasers in science and engineering. [8]

Fiber Optics and Sensors

Principles – cone of acceptance, numerical aperture (derivation)- Modes of propagation –Fabrication of optical fibre: Crucible-crucible technique - Classification: based on materials, modes and refractive index profile– Splicing : types of splicing- Losses in optical fiber – Detectors – Fiber optical communication links (Block diagram) – Advantage of fiber optical cable over copper cables- Fiber optic sensors: liquid level sensors, Temperature and Displacement sensors.

[9]

Ultrasonics and Applications

Introduction-Properties-Production: Magnetostriction effect, Magnetostriction generator- piezoelectric effect, piezoelectric generator – Ultrasonic detection- acoustical grating-Applications: Cavitation, cleaning, SONAR– Non destructive testing: Pulse echo system, through transmission, resonance system- Medical applications: cardiology, neurology, ultrasonic imaging (A, B and TM- Scan). [9]

Surface Tension, Viscosity and Friction

Molecular forces-Rise of liquids in a capillary tube-Determination of surface tension by capillary rise method-Viscosity-Co-efficient of viscosity-streamline and turbulent flow-Reynold's number-Poiseuille's equation for the flow of liquid through a tube-Volume of liquid flowing out-Stoke's law-Terminal velocity-Experimental determination of co-efficient of viscosity for a liquid by Poiseuille's method-Comparision of viscosities-Ostwald viscometer-friction-factors influencing friction-rolling and sliding friction-hydrodynamic friction-stick slip phenomenon. [10]

Advanced Materials and Nanotechnology

New Engineering Materials: Metallic glasses – preparation, properties and applications – Shape memory alloys (SMA) – characteristics, properties of NiTi alloy applications – advantages and disadvantages of SMA

Nano Materials: Nanomaterials: Properties- Top-down process: Ball Milling method – Bottom-up process: Vapour Phase Deposition method- Carbon Nano Tube (CNT): Properties, preparation by electric arc method, Applications. [9]

Total Hours: 45

Text Book(s):

1. Rajendran V, "Engineering Physics", McGraw Education (India), PVT LTD, New Delhi,2014
2. M.N.Avathanalu & P.G.Kshirsagar, (2005) "A text book of engineering physics" S.Chand & co.ltd.

Reference(s) :

1. Dr.M.Arumugam, "Engineering Physics", Anuradha Agencies publishers, Chennai, 2005
2. P.K.Palanisamy "Engineering Physics", Scitech Publications (India), PVT LTD,Chennai,2006
3. Mathur D.S. , "Elements of properties of matter" shyamlal charitable trust, N.Delhi, 1987
4. Halliday and Resnick, Fundamentals of Physics, John Wiley and Sons, Inc, 11 th edition,2018

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50 PH 005 - Applied Physics for Textile															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	3	2	2	3	2	1	1	1			3	2	2
CO2	3	3	3	3	3	3	2	2	2	3	2	1	3	2	1
CO3	3	3	3	2	2	3	2	2	2	3			3	1	2
CO4	3	2	2	2	3	2	2	2	2	2	3	2	2	1	1
CO5	3	3	3	3	3	2	2	2	2	3			2	1	2

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K.S.Rangasamy College of Technology – Autonomous								R2018
50 CS 001 - Programming For Problem Solving								
Common to all Branches								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	3	0	0	45	3	50	50	100

Objective(s)	• To learn the evolution of computers and examines the most fundamental element of the C language • To examine the execution of branching, looping statements, arrays and strings. • To understand the concept of functions , pointers and the techniques of putting them to use • To apply the knowledge of structures and unions to solve basic problems in C language • To enhance the knowledge in file handling functions for storage and retrieval of data
Course Outcomes	**At the end of the course, the students will be able to** 1. Infer the evolution, generation, representation of problem and recognize the concepts of data types and expressions 2. Annotate the concept of console Input and output features and examine the execution of branching, looping statements, arrays and strings 3. Recognize the concepts of functions, recursion, storage class specifies and pointers with its features 4. Comprehend basic concepts of structures ,unions ,user defined data types and pre processor 5. Interpret the file concepts using proper standard library functions

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Introduction to Computer and Programming

Introduction to Computers - Evolution of computers - Generations of computers and Programming Languages– Introduction to components of a computer system -Idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart–Pseudocode with examples. From algorithms to programs–variables (with data types)– Type Qualifiers - Constants – Operators –expressions and precedence [9]

I/O ,Branching, Loops and Arrays

Console I/O– Unformatted and Formatted Console I/O – Conditional Branching and Loops -Writing and evaluation of conditionals and consequent branching -Iteration and loops - Arrays (1-D, 2-D), Character arrays and Strings [9]

Functions and Pointers

Functions: Scope of a Function – Library Functions and User defined functions - Function Prototypes – Function Categorization - Function Arguments - Arguments to main function - The return Statement - Recursion - Passing Arrays to Functions– Storage class Specifiers. Introduction to Pointer Variables - The Pointer Operators - Pointer Expressions - Pointers and Arrays - Generating a Pointer to an Array - Indexing Pointers– Dynamic memory allocation [9]

Structures, Unions, Enumerations, Typedef and Preprocessors

Structures - Arrays of Structures- Arrays and Structures within Structures - Passing Structures to Functions - Structure Pointers - Unions – Bit Fields - Enumerations - typedef – The preprocessor and comments. [9]

File

File: Streams –Reading and Writing Characters - Reading and Writing Strings -,File System functions - Random Access Files [9]

Total Hours: 45

Text book(s):

1. Herbert Schildt, “The Complete Reference C”, Fourth Edition, Tata McGraw Hill Edition, 2010.
2. Byron Gottfried, “Programming with C”, Third Edition, McGraw Hill Education, 2014.

Reference(s):

1. E.Balagurusamy, “Programming in ANSI C”, Seventh Edition, Tata McGraw Hill Edition, New Delhi, 2016.
2. Brian W. Kernighan and Dennis M. Ritchie, “C Programming Language”, Prentice-Hall.
3. Reema Thareja, “Computer Fundamentals and Programming in C”, Second Edition, Oxford Higher Education, 2016.
4. K N King, “C Programming: A Modern Approach”, Second Edition, W.W.Norton, New York, 2008.

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50 CS 001 - Programming For Problem Solving															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	1	3		2	2							1			
CO2	1	3		3	3			2				2	3	3	
CO3	1	3		2	3			2				2	2	2	
CO4	1	3		3	3			2				2	3	3	
CO5	1	3		2	3			2				2	3	2	

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K.S.Rangasamy College of Technology – Autonomous								R2018
50 ME 001 - Engineering Drawing								
Common to Civil , Mech, MCT & Tex								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	2	0	4	90	4	50	50	100

Objective(s)	• To acquire various concepts like dimensioning, conventions and standards. • To impart the graphic skills for converting pictorial views of solids in to orthographic views. • To learn the concept of projection of solids. • To understand the section of solids and development of surfaces. • To learn the concept of isometric projection.
Course Outcomes	**At the end of the course, the student will be able to** 1. Use the drafting instruments and construct the conic sections 2. Convert the pictorial views of solids in to orthographic views 3. Draw the projections of regular solids and floor plans 4. Draw the true shape of sections and develop the lateral surfaces of right solids 5. Sketch the three dimensional view of solids for given orthographic views.

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Introduction to Engineering Drawing and Plane Curves

Use of drawing instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning – Drawing sheet layouts - Title block – Line types – Scales: plain, diagonal and vernier scales. Construction of ellipse, parabola and hyperbola (Eccentricity method) - Construction of rectangular hyperbola - Construction of cycloids, epicycloids and hypocycloids. [7+12]

Orthographic Projection

Introduction to orthographic projections – Planes of projection – Projection of points and lines inclined to both planes – Projection of planes (Inclined to one plane and parallel to other – Inclined to both planes) - Conversions of pictorial views to orthographic views. [6+12]

Projection of Solids and Floor plan

Projections of simple solids: prism, pyramid, cylinder and cone (Axis of solid inclined to both HP and VP) - Floor plans: windows, doors and fixtures such as water closet (WC), bath sink, shower etc. [5+12]

Sections of solids and Development of surfaces

Sections of solids :Prism, Cylinder, Pyramid, Cone – Auxiliary Views - Draw the sectional orthographic views of geometrical solids, objects from industry - Development of surfaces of Right solids – Prism, Pyramid, Cylinder and Cone. [6+12]

Isometric Projection

Principles of isometric projection – Isometric scale – Isometric projections of simple solids: Prism, pyramid, cylinder and cone - Isometric projections of frustum and truncated solids - Combination of two solid objects in simple vertical positions. [6+12]

Total Hours: 90

Text Book(s):

1. Bhatt N.D., “Engineering Drawing”, Charotar Publishing House Pvt. Ltd., 53rd Edition, Gujarat, 2014.
2. Basant Agarwal and C.M.Agarwal., “Engineering Drawing”, McGraw Hill Education, 2013.

Reference(s)

1. Shah M.B., Rana B.C., and V.K.Jadon., “Engineering Drawing”, Pearson Education, 2011.
2. Natarajan K.V., “A Text Book of Engineering Graphics”, Dhanalakshmi Publishers, Chennai, 2014.
3. Venugopal K., “Engineering Graphics”, New Age International (P) Limited, 2014.
4. Dhawan, R.K., “A Text Book of Engineering Drawing” 3rd Revised Edition, S. Chand Publishing, New Delhi, 2012.

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50 ME 001 - Engineering Drawing															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	3	1	1	1		3	2	2	3	2	1
CO2	3	3	3	3	3	1		1		3	1	1	3	2	1
CO3	3	3	3	3	3	1		1		3	1	1	3	2	1
CO4	3	3	3	3	3	1		1		3	1	1	3	2	1
CO5	3	3	3	3	3	1		1		3	1	1	3	2	1

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K.S.Rangasamy College of Technology – Autonomous								R 2018
50 MY 001 - Constitution of India								
Common to all Branches								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	2	0	0	30	-	100	-	100

Objective(s)	• To know the premises informing the twin themes of liberty and freedom from a civil rights perspective. • To address the growth of Indian opinion regarding modern Indian intellectuals' constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism. • To address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution. • To gain knowledge on bill passing • To acquire knowledge on function of election commission
Course Outcomes	**At the end of the course, the student will be able to** 1. Discuss the growth of the demand for civil rights in India for the bulk of fns before the arrival of Gandhi in Indian politics. 2. Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India. 3. Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution. 4. Discuss the passage of the Hindu Code Bill of 1956. 5. Explain the functions of Election Commission

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

History of Making of the Indian Constitution:
History - Drafting Committee, (Composition& Working) [2]

Philosophy of the Indian Constitution:
Preamble - Salient Features [2]

Contours of Constitutional Rights & Duties:
Fundamental Rights - Right to Equality - Right to Freedom - Right against Exploitation -Right to Freedom of Religion - Cultural and Educational Rights - Right to Constitutional Remedies - Directive Principles of State Policy - Fundamental Duties. [6]

Organs of Governance:
Parliament - Composition - Qualifications and Disqualifications - Powers and Functions Executive - President - Governor - Council of Ministers - Judiciary, Appointment and Transfer of Judges, Qualifications - Powers and Functions. [6]

Local Administration:
District's Administration head: Role and Importance, - Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation - Pachayati raj: Introduction, PRI: ZilaPachayat - Elected officials and their roles, CEO ZilaPachayat: Position and role- Block level: Organizational Hierarchy (Different departments) -Village level: Role of Elected and Appointed officials - Importance of grass root democracy. [9]

Election Commission:
Election Commission: Role and Functioning- Chief Election Commissioner and Election Commissioners- State Election Commission: Role and Functioning- Institute and Bodies for the welfare of SC/ST/OBC and women. [5]

Total Hours: 30

Text Book(s):

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.

Reference(s):

1.	Basu, D D., "Introduction to the Constitution of India", Lexis Nexis, 2015.
2.	M.P Jain, "Indian Constitution Law", 7th Edition, Lexis Nexis, 2014.
3.	S R Bhansali, "Textbook on The Constitution of India", Universal Publishers, 2015
4.	M P Jain, "Outlines of Indian Legal and Constitutional History", Lexisnexis, 2014

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50 MY 001 - Constitution of India															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1								2	2	1		2			
CO2								2	2	1		2			
CO3								2	2	1		2			
CO4								2	2	1		2			
CO5								2	2	1		2			

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K.S.Rangasamy College of Technology – Autonomous								R2018
50 PH 0P1 - Engineering Physics Laboratory								
Common to - MECH, MCT, Textile, FT, BT, NST, CIVIL								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	0	0	4	60	2	60	40	100
Objective(s)	• To gain practical knowledge by applying the experimental methods to correlate with the Physics theory. • Demonstrate an ability to make physical measurements and understand the limits of • precision in measurements • To introduce different experiments to test basic understanding of physics concepts applied in optics and electronics. • To enable the students to correlate the theoretical principles with application oriented studies. • Analyze the behavior and characteristics of various materials for its optimum utilization							
Course Outcomes	**At the end of the course, Students will able to** 1. Apply the concept of stress, strain and elastic limit for a given sample to find their properties.(1-3) 2. Recognize the viscosity and surface tension properties of liquids for its various applications.(4-6) 3. Recall the knowledge of properties of light through spectrometer grating and fiber optic cable (7-8) 4. Assess the dielectric behavior of a given material.(9) 5. Interpret the photovoltaic effect to demonstrate the working of solar cell.(10)							

LIST OF EXPERIMENTS

1. Determination of Young's modulus of a steel bar by uniform bending method.
2. Determination of Young's modulus of a cantilever (Pin & Microscope method).
3. Determination of rigidity modulus of a wire by torsional pendulum.
4. Comparison of co-efficient of viscosity of two different liquids by Poiseuille's method.
5. Co-efficient of viscosity of highly viscous liquids.
6. Comparison of surface tension of two different liquids by capillary rise method.
7. Determination of NA, acceptance angle, and wave length of a given laser by using optical fiber.
8. Determination of wavelength of mercury spectral lines – spectrometer grating.
9. Determination of dielectric constant.
10. V-I characteristics of solar cell.

Total Hours: 60

Lab Manual:

"Physics Lab Manual", Department of Physics , KSRCT

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50 PH 0P1 - Engineering Physics Laboratory															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	2	2	2	2	2	2	2		2	2	2	
CO2	3	3	3	2	2		2	2	2	1	1	2	2	1	2
CO3	3	2	3	2	2	1	2	1		2	2		2	2	1
CO4	3	3	3	1	3	2	2	2	1	1		1	1		1
CO5	3	3	3	2	2	3		1	1	1	2		2	1	1

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K.S.Rangasamy College of Technology – Autonomous								R2018
50 CS 0P1 - Programming for Problem Solving Laboratory								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	0	0	4	60	2	60	40	100

Objective(s)	• To enable the students to apply the concepts of C to solve simple problems • To use selection and iterative statements in C programs • To apply the knowledge of library functions in C programming • To implement the concepts of arrays, functions, structures and pointers in C • To implement the file handling operations through C
Course Outcomes	**At the end of the course the students will be able to** 1. Apply how to read, display basic information and use selection and iterative statements 2. Demonstrate C program to manage collection of related data 3. Design and Implement different ways of passing arguments to functions, Recursion and implement pointers concepts 4. Develop a C program to manage collection of different data using structures, Union, user-defined data types and pre processor directives 5. Demonstrate C program to store and retrieve data using file concepts

LIST OF EXPERIMENTS

1. Implementation of Simple computational problems using various formulas.
2. Implementation of Problems involving Selection statements.
3. Implementation of Iterative problems e.g., sum of series.
4. Implementation of1D Array manipulation.
5. Implementation of2D Array manipulation.
6. Implementation of String operations.
7. Implementation of Simple functions and different ways of passing arguments to functions and Recursive Functions.
8. Implementation of Pointers
9. Implementation of structures and Union.
10. Implementation of Bit Fields, Type def and Enumeration.
11. Implementation of Pre processor directives.
12. Implementation of File operations.

Total Hours: 60

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50 CS 0P1 - Programming for Problem Solving Laboratory															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	1	3		2	2							1			
CO2	1	3		3	3			2				2	3		
CO3	1	3		2	3			2				2		1	
CO4	1	3		3	3			2				2	2		
CO5	1	3		2	3			2				2		1	

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K.S.Rangasamy College of Technology – Autonomous								R2018
50 EN 002 – Communication Skills II								
Common to all Branches								
Semester	Hours/Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
II	1	1	0	30	2	50	50	100

Objective(s)	• To help learners improve their vocabulary and to enable them to use words appropriately in different academic and professional contexts. • To help learners develop strategies that could be adopted while reading texts. • To help learners acquire the ability to speak and write effectively in English in real life and career related situations. • Improve listening, observational skills, and problem solving capabilities • Develop message generating and delivery skills
Course Outcomes	**At the end of the course, students will be able to** 1. Identify speaker's purpose &tone, comprehend relationship between ideas and respond to the listening content 2. Use communicate strategies, vocabulary & appropriate grammatical structures for effective oral interactions 3. Make inferences & predictions develop reading speed, build academic vocabulary by utilizing digital literacy tools on textual comprehension 4. Use a variety of accurate sentence structures with functional vocabulary, apply the conventions of academic writing and use peer and teacher feedback for effective writing. 5. Demonstrate proficiency in communication skills in academic and professional contexts

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Advanced English Listening Module

Extended Listening to Podcasts – Listen and Watch Video Clips - answering Inferential Multiple Choice Questions and Vocabulary Check- Listening to Lengthy Discourses – Structured Listening – Listening to Songs and Cognizing the Lyrics-Listening to popular speeches, news briefs and stories. [4]

Oral Communication

Debates – Group Discussion (Structured) and rotate roles – Elevator Speech – Prepared Talk – Extempore – Brief Technical presentations- Spin-a-Yarn – Short Film reviews – talk on silent videos – Dialogues and Role plays (Intermediate & Higher Level) – Interviews [4]

Critical Reading Process

Silent Reading – Scanning and Skimming - Reading comprehension with logical reasoning questions – Cognition of Theme and Inferential Meaning – advanced Academic and Functional Vocabulary List (1000 words) – word webs and semantic threads - Loud Reading – Modulation and Pronunciation Check – Mind maps – Note making – Deep Reading Skills [4]

Academic Writing Practices

Sentence Equivalence and Text completion tasks – Data Interpretation - Essay Writing – Letter Writing – Business Emails – Conversational Fill Ups-Rewordify (select a text and simplify/enhance the language)- Reports on events. [3]

Lecture Hours: 15 Tutorial hours: 15 Total Hours: 30

Text Book(s):

1.	M.Ashraf Rizvi, 'Effective Technical Communication', 2nd Edition, McGraw Hill Education (India) Private Limited, Chennai, 2018
2.	Norman Lewis, 'Word Power Made Easy - The Complete Handbook for Building a Superior Vocabulary Book', Penguin Random House India, 2020

Reference(s):

1.	Paul Emmerson and Nick Hamilton , 'Five Minute Activities for Business English', Cambridge University Press, N.York, 2005
2.	Ruth Wainry b, 'Stories: Narrative Activities for The Language Classroom', Cambridge University Press, N.York, 2005
3.	Stuart Redman, 'English Vocabulary in Use: Upper Intermediate', Cambridge University Press, N.Y, 2006
4.	https://www.khanacademy.org/test-prep/sat/sat-reading-writing-practice

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50 EN 002 – Communication Skills II															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	1	2		2	1	1	1	2	3	3	2	3	1	1	2
CO2	1	2	1	3	2	1		2	3	3	2	3	1	1	2
CO3	1	2	1	2	1	1	2	2	2	3	2	3	1	2	2
CO4	1	3	1	2	2	2	1	2	2	3	3	3	1	1	1
CO5	1	1	1	1	1	1	1	1	3	3	2	3	1	2	3

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K.S. Rangasamy College of Technology – Autonomous								R2018
50 MA 002 - Laplace Transform and Complex Variables								
Common to all Branches								
Semester	Hours / Week			Total	Credit	Maximum Marks		
	L	T	P	hrs	C	CA	ES	Total
II	3	1	0	60	4	50	50	100

Objective(s)	• Multiple integration is used to solve problems involving volume and surface area. • Vector calculus can be widely used for modeling the various of physics. • Introduce the fundamental ideas of the functions of complex variables and developing a clear understanding of the fundamental concepts of complex analysis such as analytic function and complex integral. • Identify and construct complex - differentiable function. • Laplace Transforms can be used for efficiently solving the problems that occur in various branches of engineering disciplines.
Course Outcomes	**At the end of the course, the students will be able to** 1. (i) Evaluate double and triple integrals. (ii)Understand the concept of Beta and Gamma functions. 2. Apply the concept of vector calculus to verify Green's, Stoke's and Gauss divergence theorems. 3. Construct analytic function and bilinear transformation. 4. Expand the functions as Taylor's and Laurent's series and evaluate the complex integrals. 5. Apply Laplace transform techniques for solving differential equations.

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Multiple Integrals

Double integration – Cartesian and polar coordinates – Change of order of integration – Area between two curves – Area as double integral – Triple integration in Cartesian coordinates.

Beta and Gamma functions**:** Relationship between Beta and Gamma functions – Properties – Problems. [9]

Vector Calculus

Introduction - gradient of a scalar point function - directional derivative - angle of intersection of two surfaces – divergence and curl(excluding vector identities) - solenoidal and irrotational vectors - Green's theorem in the plane - Gauss divergence theorem -Stokes' theorem(without proof)- verification of the above theorems and evaluation of integrals using them. [9]

Analytic Functions

Analytic functions – Necessary conditions (Cauchy–Riemann equations)- Polar form of Cauchy–Riemann equations – Sufficient conditions (without proof) – Properties of analytic functions – Harmonic function –Harmonic conjugate – Construction of analytic functions– Conformal mapping: w = z + a, az, 1/z -Bilinear transformation. [9]

Complex Integration

Cauchy's Integral theorem (without proof) – Cauchy's integral formula – Taylor's and Laurent's series (without proof) – Classification of singularities – Cauchy's residue theorem – Contour integration – Circular and semi-circular contours (excluding poles on real axis). [8]

Laplace Transforms

Conditions for existence – Transform of elementary functions – Basic properties – Shifting theorems- Derivatives and integrals of transforms –– Transform of unit step function – Dirac's delta function- Initial and final value theorem– Transform of periodic functions. Inverse Laplace transform – Convolution theorem (excluding proof) – Solution of second order ordinary differential equation with constant co-efficients – simultaneous equations of first order with constant co-efficients. [10]

Lecture Hours:45, Tutorial Hours:15, Total Hours: 60

Text Book(s):

1. Grewal B.S, "Higher Engineering Mathematics", 43rd Edition, Khanna Publishers, Delhi, 2014.
Website: https://pvpsitrealm.blogspot.com/2016/09/higher-engineering-mathematics-by-bs.html
2. Kreyszig Erwin, "Advanced Engineering Mathematics", 10th Edition, John Wiley and Sons (Asia) Limited, New Delhi, 2016.

Reference(s):

1. Bali.N.P and Dr.Manish Goyal,"A text book of Engineering Mathematics",8th edition, Laxmi Publications (P) Ltd., 2011.
2. Veerarajan.T. "Engineering Mathematics", for Semesters I and II , Tata McGraw Hill Publishing Co., New Delhi, 2010.
3. Dr P. Kandasamy,Dr K. Thilagavathy and Dr K. Gunavathy , "Engineering Mathematics -II", S.Chand & Company Ltd, New Delhi.
4. SWAYAM online video courses.(www.swayamprabha.gov.in)

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50 MA 002 - Laplace Transform and Complex Variables															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	2	3							2	3		
CO2	3	3	2	2	3							2	3		
CO3	3	3	3	2	2							2	3		
CO4	3	3	2	2	3							2	3		
CO5	3	3	2	3	3							2	3		

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K.S. Rangasamy College of Technology – Autonomous								R2018
50 CH 001 - Applied Chemistry								
Semester	Periods / Week			Total hours	Credit	Maximum marks		
	L	T	P	45	C	CA	ES	Total
II	3	0	0		3	50	50	100

Objective(s)	• To rationalize the periodic properties such as ionization potential, electronegativity, oxidation state, electro negativity, atomic and molecular orbitals • To analyze the thermodynamic functions, concept of cells and corrosion of metals and its control methods • To help the learners to analyze the hardness of water and its removal • To endow with an overview of spectroscopy principles and its applications • To recall the basics of stereochemistry and reaction mechanism
Course Outcomes	**At the end of the course, the student will be able to:** 1. Rationalize the periodic properties, variation of orbitals, interactions and orbitals with energy level diagrams 2. Analyze the thermodynamic functions, cell potentials and corrosion with its control measures 3. Recognize the sources ,hardness of water and its removal 4. Interpret the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques 5. Review of stereochemistry and types of chemical reactions with their mechanism

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Periodic Properties

Effective nuclear charge - atomic and ionic sizes - ionization energies - electron affinity - electronegativity - polarizability - oxidation states - penetration of orbitals- variations of s, p, d and f orbital energies of atoms - electronic configurations, ionic, dipolar and Vander- waals interactions. Hard soft acids and bases (HSAB). Molecular orbitals of diatomic molecules - plots of the multicentre orbitals. Equations for atomic and molecular orbitals. Energy level diagrams of diatomics. Pi-molecular orbital of butadiene and benzene. [9]

Chemical Equilibria and Corrosion

Thermodynamic functions - energy - entropy - enthalpy- free energy - Gibbs-Helmholtz equation - Van 't Hoff isotherm. Cell potentials - Nernst equation - applications - EMF series - applications - Poteniometric and Conductometric titrations.

Corrosion- types of corrosion - chemical and electrochemical corrosion - mechanism - Factors influencing corrosion - Corrosion control methods (impressed current and sacrificial anode methods) - Corrosion inhibitors. [9]

Water Chemistry

Sources - Water quality parameters - impurities in water and their effects. Hardness - Estimation of hardness - effect of hard water in various industries-Softening of water- zeolite process- ion-exchange process - reverse osmosis - electrodialysis. Boiler troubles - methods of prevention. [9]

Analytical Techniques and Applications

Absorption laws - Ultra violet spectroscopy (UV) - Principle - Instrumentation (Block diagram) - applications. Infra red spectroscopy (IR)- Instrumentation (Block diagram) - selection rule - types of fundamental vibrations - applications. Nuclear magnetic resonance spectroscopy (NMR) - Principle - selection rule - Instrumentation (Block diagram) - chemical shift - factors influencing the chemical shift -applications. Atomic absorption spectroscopy (AAS) - Principle - Instrumentation (Block diagram) -applications. [9]

Concepts in Organic Chemistry

Structural isomerism- types - Stereoisomerism - geometrical (Maleic and Fumaric acids) - optical isomerism (Lactic and Tartaric acids) - symmetry - chirality- enantiomers - diastereomers - optical activity - absolute configurations. Introduction to reactions - substitution - addition - oxidation - reduction - cyclization and ring openings - mechanism. [9]

Total Hours: 45

Text Book(s):

1. Jain. P.C. and Monica Jain, "Engineering Chemistry", Dhanpatrai publishing co. New Delhi, 14th edition, 2015.
2. Dr.S.Vairam and Dr.Suba Ramesh, "Engineering Chemistry", Wiley India Limited, 2nd Edition, 2013.

Reference(s):

1. Puri B. R., Sharma L.R., and Pathania M.S., "Principles of Physical Chemistry", Vishal Publishing Company, New Delhi, 2017.
2. Dara. S.S, "A Text Book of Engineering Chemistry", S Chand & co. Ltd., 2014.
3. Bahl B.S. and Arun Bahl, "Advanced Organic Chemistry", S.Chand & co. Ltd., New Delhi, 2014.
4. Sharma BK. Instrumental methods of chemical analysis, Goel Publishing House Meerut, 23rd Edition, 2014.

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50 CH 001 - Applied Chemistry															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	2	2	2	2	2		1	1	2			1
CO2	3	3	3	2	2	2	3	2	1	1	1	1	2	3	3
CO3	3	3	3	3	2	3	3	3	3	1	2	3	3	3	3
CO4	3	3	3	3	3	3	3	1	2	1	2	3	2	2	2
CO5	3	3	3	3	2	2	2	2	1	1	1	1	1	3	3

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K.S.Rangasamy College of Technology – Autonomous								R2018
50 EE 001 - Basic Electrical Engineering								
Common to all Branches								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
II	3	0	0	45	3	50	50	100

Objective(s)	• To understand and determine the electrical quantity in DC and AC circuits. • To understand the working principle of electrical machines by applying Faraday's laws of electromagnetic induction. • To know the sources of electric power generation and explain the working principles of different types of power plant. • To understand the various components of low voltage electrical installation and basic house wiring. • To implement the principles of energy conservation and understand the need of earthing and safety measures.
Course Outcomes	**At the end of the course, the students will be able to** 1. Analyze the fundamentals of electric circuits excited by DC and AC supply. 2. Explain the construction and working of DC and AC electrical machines and identify their applications. 3. Describe the operation of various types of power plant with their layouts. 4. Recognize the significance of various components of low voltage electrical installations. 5. Demonstrate the various types of wiring used in domestic and to know safety measures.

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

DC and AC Circuits

Electrical circuit elements (R, L and C), Voltage and current sources – Kirchhoff's current and voltage laws – Serial and parallel circuits – Analysis of simple circuits with DC excitation.

Representation of sinusoidal waveforms, Peak and RMS values, Phasor representation, Real power, Reactive power, Apparent power, Power factor. Analysis of single-phase AC circuits consisting of R, L, C, RL, RC, RLC combinations. [12]

DC Machines

Construction, Types and Operation, Simple Problems – Applications. [6]

AC Machines

Faraday's laws of electromagnetic induction – Transformers: Construction, Working principle, Types, Losses in transformers, Regulation, Efficiency and applications.

Generation of rotating magnetic fields – Three-phase induction motor: Construction, working principle, Characteristics, Starting-Single-phase induction motor: Construction, working principle and applications – Synchronous generators: Construction, Working principle and applications. [8]

Electrical Power Generation Systems

Sources of electrical energy: Renewable and nonrenewable – Principles and schematic diagram of Hydroelectric power plant, Thermal power plant, Nuclear power plant, Solar PV system and Wind energy conversion systems. [5]

Electrical Installations and House Wiring

Components of LT Switchgear: Switch Fuse Unit (SFU), MCB, ELCB, MCCB – Types of Batteries, Important Characteristics for Batteries – UPS.

Single phase and three phase systems: Three phase balanced circuits, Phase sequence, voltage and current relations in star and delta connections- Basic house wiring tools and components – Domestic wiring: Service mains, meter board, distribution board, energy meter. Different types of wiring: staircase, fluorescent lamp and ceiling fan. [8]

Electrical Energy Conservation &Safety

Elementary calculations for energy consumption –BEE Standards –Electrical energy conservation – Methods.

Electric shock, Precautions against shock, Objectives of earthing, Types of earthing – Basic electrical safety measures at home and industry. [6]

Total Hours: 45

Text Book(s):

1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2017.
2. D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2017.

Reference(s):

1. L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.
2. E. Hughes, "Electrical and Electronics Technology", Pearson, 2016.
3. V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 2015.
4. Vincent Del Toro, "Electrical Engineering Fundamentals", Prentice Hall, 2006.

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Approved in Academic Council Meeting held on 07/01/2023.

50 EE 001 - Basic Electrical Engineering															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3			2					2	3		3	2	
CO2	3	3	1	1			2		2		2	1	3	2	
CO3	3	3	2	2			2	2	1			1	3	3	
CO4	3	3		2		2					2	2	3	2	
CO5	3	3	2	1	2	2			2		2	2	3	2	

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K. S. Rangasamy College of Technology – Autonomous								R2018
50 ME 003 – Engineering Mechanics								
Common to all Branches								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
II	3	1	0	60	4	50	50	100

Objective(s)	• To learn a process for analysis of static objects, concepts of force, moment, and mechanical equilibrium in two and three dimensions. • To learn the equilibrium of rigid bodies such as frames, trusses, beams. • To identify the properties of surfaces and solids by using different theorem. • To impart basic concept of dynamics of particles • To understand the concept of friction and elements of rigid body dynamics.
Course Outcomes	**At the end of the course, the student will be able to** 1. Use scalar and vector analytical techniques for analysing forces in statically determinate structures. 2. Apply basic knowledge of scientific concepts to solve real-world problems. 3. Calculate the properties of surfaces and solids using various theorems. 4. Analyse and solve problems on kinematics and kinetics. 5. Draw a shear force and bending moment diagrams, analysis of rigid body dynamics and calculation of frictional forces on contact surfaces.

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Basics and Statics of Particles

Introduction –Units and Dimensions-Laws of Mechanics–Principle of transmissibility-Lame's theorem, Parallelogram and triangular Law of forces–Vectors–Vectorial representation of forces and moments.

Vector operations [9]

Addition, subtraction, dot product, cross product-Coplanar Forces–Resolution and Composition of forces–Equilibrium of a particle– Forces in space-Equilibrium of a particle in space-Equivalent systems of forces-Single equivalent force.

Equilibrium of Rigid Bodies

Free body diagram–Types of supports and their reactions–requirements of stable equilibrium–Static determinacy, Moments and Couples–Moment of a force about a point and about an axis–Vectorial representation of moments and couples–Varignon's theorem-Equilibrium of Rigid bodies in two dimensions.

Trusses: Introduction, axial members, calculation of forces on truss members using method of joints-Method of sections. [9]

Properties of Surfaces and Solids

Determination of Areas and Volumes-Centroid, Moment of Inertia of plane area (Rectangle, circle, triangle using Integration Method; T section, I section, Angle section, Hollow section using standard formula) – Parallel axis theorem and perpendicular axis theorem- Polar moment of inertia –Mass moment of inertia of thin rectangular section –Relation between area moment of inertia and mass moment of inertia. [9]

Dynamics of Particles

Displacement, Velocity, acceleration and their relationship–Relative motion –Projectile motion in horizontal plane–Newton's law–Work Energy Equation – Impulse and Momentum. [9]

Elements of Rigid Body Dynamics, friction and Beams

Translation and Rotation of Rigid Bodies: Velocity and acceleration–General Plane motion: Crank and Connecting rod mechanism.

Friction

Frictional force–Laws of Coloumb friction–Simple contact friction–Ladder friction-Rolling resistance–Ratio of tension in belt.

Transverse bending on beams

Types of beams: Supports and loads – Shear force and bending moment in beams – Cantilever, simply supported and overhanging beams. [9]

Lecture Hours:45, Tutorial Hours:15, Total Hours: 60

Text Book(s):

1. Rajasekaran, S, Sankarasubramanian, G., "Fundamentals of Engineering Mechanics", Vikas Publishing House Pvt. Ltd., 3rd Edition, 2017.
2. Beer, F.P and Johnson Jr. E.R, "Vector Mechanics for Engineers, Statics and Dynamics", McGraw-Hill International, 11thEdition, 2016.

Reference(s):

1. Jayakumar, V. and Kumar, M, "Engineering Mechanics", PHI Learning Private Ltd, New Delhi, 2012
2. Hibbeller, R.C., "Engineering Mechanics", Vol. 1 Statics, Vol. 2 Dynamics, Pearson Education Asia Pvt. Ltd., 2016.
3. Bansal R.K," Engineering Mechanics" Laxmi Publications (P) Ltd, 2011.
4. Irving H. Shames, "Engineering Mechanics – Statics and Dynamics", Pearson Education Asia Pvt. Ltd, 4thEdition, 2003.

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50 ME 003 – Engineering Mechanics															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	3								2	3	1	1
CO2	3	2	2	3								2	3	1	1
CO3	3	2	2	3								2	3	1	2
CO4	3	2	2	3								2	3	1	2
CO5	3	2	2	3								2	3	1	2

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K.S.Rangasamy College of Technology – Autonomous								R 2018
50 MY 002 – Environmental Science								
Common to all Branches								
Semester	Hours / Week			Total Hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
II	2	0	0	30	-	100	-	100

Objective(s)	• To help the learners to analyze the importance of ecosystem and biodiversity. • To familiarize the learners with the impacts of pollution and control. • To enlighten the learners about waste and disaster management. • To endow with an overview of food resources, human health, population awareness. • To recognize the social responsibility in environmental issues.
Course Outcomes	**At the end of the course, the student will be able to** 1. Recognize the concepts and issues related to environment, ecosystem and biodiversity. 2. Analyze the source, effects, and control measures of pollution. 3. Enlighten of solid waste and disaster management. 4. Awareness about food resources, population and health issues. 5. Analyze the social issues and civic responsibilities.

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Environment, Ecosystem and Biodiversity

Environmental studies - Scope and multidisciplinary nature - Need for public awareness - Ecosystem - Food chain - Food web- Structure and function. Biodiversity - Values of biodiversity - Endangered and endemic species - Hot spots - India a mega biodiversity nation - Threats - Conservation - In-situ and ex-situ - Case studies. [6]

Environmental Pollution

Pollution - Air, water, soil, noise and nuclear - sources, effects and control measures - Impacts of mining. - Environment protection act- Case studies. [6]

Waste and Disaster Management

Waste – wealth from waste - Solid waste - e-waste - sources, effects and control measures. Disaster management - Earth quakes - Landslides - Floods - Cyclones - Tsunami - Disaster preparedness - Case studies. [5]

Food Resources, Human Population and Health

World food problems - over grazing and desertification - effects of modern agriculture. Population - Population explosion and its impacts - HIV/AIDS - Cancer- Role of IT in environment and human health - Case studies. [6]

Social Issues and the Environment

Unsustainable to sustainable development - Use of alternate energy sources - Rain water harvesting - Water shed management - Deforestation - Green house effect - Global warming - Climate change - Acid rain - Ozone layer depletion - Waste land reclamation. Consumerism and waste products - Role of an individual in conservation of natural resources – Case studies. [7]

Total Hours: 30

Text book(s):

1. Anubha Kaushik and C P Kaushik, “Perspectives in Environmental Studies” , New Age International Publishers, New Delhi, 6th edition , January 2018.
2. Tyler Miller. G, “Environmental Science”, Cengage Publications, Delhi, 16th edition, 2018.

Reference(s):

1. Gilbert M.Masters and Wendell P. Ela,”Environmental Engineering And Science”, PHI Learning Private Limited, New Delhi, 3rd Edition, 2013.
2. Rajagopalan. R, “Environmental Studies” Oxford University Press, New Delhi, 2nd edition, 2012.
3. Deeksha Dave and Katewa. S.S, “Environmental Studies”,Cengage Publications, Delhi, 2nd edition, 2013
4. Cunningham, W.P. and Saigo, B.W. Environment Science, Mcgraw-Hill, USA. 9th edition, 2007.

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50 MY 002 – Environmental Science															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	1	2	1	1	2	3	3	3	3		2	1	1	1
CO2	3	3	3	3	2	3	3	3	3	3	2	2	3	3	3
CO3	3	3	3	3	2	3	3	3	3	3	2	2	3	3	3
CO4	2	2	2	3	3	3	3	3	2	2	3	2	1	1	1
CO5	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3

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K.S.Rangasamy College of Technology - Autonomous								R 2018
50 CH 0P1 - Chemistry Laboratory								
Semester	Periods / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
II	0	0	4	60	2	60	40	100

Objective(s)	• To test the knowledge of theoretical concepts. • To develop the experimental skills of the learners. • To facilitate data interpretation. • To enable the learners to get hands-on experience on the principles discussed in theory sessions. • To expose the learners to various industrial and environmental applications.
Course Outcomes	**At the end of the course, the student will be able to** 1. Estimate the amount of hardness, alkalinity, chloride ion and dissolved oxygen in water sample 2. Estimate the amount of barium chloride and mixture of acids by conductometry 3. Estimate the amount of ferrous ion by potentiometry 4. Estimate the amount of acid by pH metry and apply the knowledge of pH determination for health drinks, beverages, soil, effluent and other biological samples 5. Estimate the amount of ferrous ion by spectrophotometry 6. Determine the percentage of corrosion by weight loss method

LIST OF EXPERIMENTS

1. Estimation of hardness of water by EDTA method.
2. Estimation of alkalinity of water sample.
3. Estimation of chloride content in water sample (Argentometric method).
4. Determination of dissolved oxygen in boiler feed water (Winkler's method).
5. Estimation of barium chloride by conductometric precipitation titration.
6. Estimation of mixture of acids by conductometric titration.
7. Estimation of ferrous ion by potentiometric titration.
8. Estimation of HCl, beverages and other biological samples by pH meter.
9. Estimation of iron content by spectrophotometry method.
10. Determination of corrosion rate and inhibitor efficiency by weight loss method.

Total Hours: 60

Text book(s):

1. Dr. S.Vairam and Dr. Suba Ramesh, "Engineering Chemistry", Wiley India Private Limited, Delhi, 2nd edition, January 2013.
2. S.S. Dara, "A Text Book on Experiments and Calculations Engineering", S.Chand& Co., Ltd., 2ndedition, 2003

Reference(s):

1. Mendham. J, Denney. R.C, Barnes. J.D, and Thomas. N.J.K, Vogel's, "Text Book of Quantitative Chemical Analysis", Pearson Education, 6th edition, 2009.
2. O P Vermani ,and A K Narula, "Applied Chemistry : Theory And Practice", New Age International (P) Ltd., Publishers, 2nd edition, January 2020.
3. Gary D. Christian, "Analytical Chemistry", John Wiley & Sons, 6th edition, 2007.
4. Chatwal Anand, "Instrumental Methods of Chemical Analysis", Himalaya Publications, 5th Edition,2019.

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50 CH 0P1 - Chemistry Laboratory															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	3	3	3	3	2		3	2	3	3	3
CO2	3	3	3	3	3	3	2	3	1		2	1		1	1
CO3	3	3	3	3	3	3	3	2	3		2	1	3	3	3
CO4	3	3	3	3	3	3	2	1			2		3	3	3
CO5	3	3	3	3	3	3	2	1			2	1	1	2	2

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K. S. Rangasamy College of Technology – Autonomous								R2018
50 ME 0P1 – Engineering Practices Laboratory								
Common to all branches								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
II	0	0	4	60	2	60	40	100

Objective(s)	• To acquire skills in basic engineering practices. • To identify the hand tools and instruments. • To provide hands on experience in Fitting, Carpentry, Sheet metal, Welding and lathe shop. • To provide practical training on house hold wiring and electronic circuits. • To offer real time activity on plumbing connections in domestic applications.
Course Outcomes	**At the end of the course, the student will be able to:** 1. Perform facing, plain turning, drilling. 2. Make a model of fitting and carpentry: Square, Dovetail and Cross lap joints. 3. Fabricate the models of sheet metal and welding joints. 4. Construct and demonstrate electrical and electronic wiring circuit. 5. Construct the water pipe line in plumbing shop.

Machine shop

Safety aspects in machine shop, Study of Lathe and Radial drilling machine, Turning, Facing and Drilling.

Fitting and Carpentry

Safety aspects in Fitting and Carpentry, Study of tools and equipments, Preparation of models- Square, Dove tail joint, Cross Lap.

Sheet Metal and Welding

Safety aspects in Sheet metal and Welding, Study of tools and equipments, Sheet metal models - Scoope, Cone, Tray, Preparation weld joints -Lap, butt, T-joints. Study of Gas Welding and Equipments.

Electrical Wiring & Electronics

Safety aspects of Electrical wiring, Study of Electrical Materials and wiring components, Wiring circuit for a lamp using single and stair case switches. Wiring circuit for fluorescent lamps, Basic electronic circuit.

Plumbing

Study of plumbing tools, assembly of G.I. pipes/ PVC and pipe fittings, Cutting of threads in G.I.Pipes /PVC by thread cutting dies.

Smithy, Plastic moulding and Glass cutting

Safety aspects in smithy, plastic moulding and glass cutting, Study of tools and equipments.

Total Hours: 60

Lab Manual :

1. “Engineering Practices Lab Manual”, Department of Mechanical Engineering, KSRCT.

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50 ME 0P1 – Engineering Practices Laboratory															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	1	3	2	2	3	1	2	2	1	3	1	2
CO2	3	2	2	1	3	2	2	3	1	2	2	1	3	1	2
CO3	3	2	2	1	3	2	2	3	1	2	2	1	3	1	2
CO4	3	2	2	1	3	2	2	3	1	2	2	1	3	1	2
CO5	3	2	2	1	3	2	2	3	1	2	2	1	3	1	2

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III Semester

K.S. Rangasamy College of Technology - Autonomous								R 2018
50 ME 008 - Elements of Mechanical Engineering								
B.Tech Textile Technology								
Semester	Hours / Week			Total Hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
III	3	1	0	60	4	50	50	100

Objective(s)	• To impart the basic knowledge on mechanisms and types of cams which are essential for understanding the textile machineries. • To impart the basic knowledge of strength of materials and power transmissions which are essential for understanding the textile machineries. • To acquaint the basic properties of steam and functions of steam boilers used in textile industries. • To acquire the basic functions of pumps, hydraulic devices used for processes in textile industries. • To utilize various air compressors, clutches and brakes used in automobiles.
Course Outcomes	**At the end of the course the students will be able to** 1. Design and construct the various cam profile and follower using various follower motions. 2. Describe the concepts of stresses and strains, their significant effects in engineering applications. 3. Select and design the appropriate power transmission drives for various requirements 4. Explain the properties of steam and different kind of steam boilers 5. Explain the working principles of pumps, hydraulic devices, air compressors, clutches and brakes.

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Basics of Mechanisms

Basic concepts of Link, Pair, Machine and Structure- Degree of freedom – Grashoff's law – Inversion of 4-bar and single slider crank mechanisms. Cams: Types of cams and followers – Motions of the follower: Simple, Harmonic and Cycloidal motion – Design of tappet mechanism – Construction of tappet cam profile. [9]

Strength of Materials

Basics of strength of materials: Simple stresses and strains in a bar – Poisson's ratio – Elastic Moduli – Thermal stress and strain. Torsion of solid, hollow circular shafts and Stepped shafts – Power transmission, strength and stiffness of shafts. Leaf spring – Stresses and deflection in close coiled helical spring. [9]

Power Transmission Drives

Belt drives: Flat belts and V-belts – types of belt drives –velocity ratio of belt drive – ratio of tensions – length and power transmitted by a belt. Chain drive: Roller chain drive. Gear drive: Types of gears – Spur, Helical, Bevel and Worm gears – Types of gear trains – Simple, compound and epicyclic gear trains – Differential gear. [9]

Properties of Steam and Steam Boilers

Formation of steam – Temperature vs. Enthalpy diagram (T-H diagram) – wet steam, saturated steam and superheated steam – dryness fraction, wetness fraction, specific volume, enthalpy and internal energy of steam – Use of steam tables. Boilers: Classification – Fire tube and Water tube boilers – Cochran boiler, Lancashire boiler, Babcock and Wilcox boiler – Boiler mountings and accessories – Applications of steam boilers. [9]

Pumps, Hydraulic Devices, Clutches and Brakes

Pumps: Classification – Components and working of Reciprocating and Centrifugal pumps. Hydraulic devices: Working of Hydraulic press and Hydraulic lift – Air compressors. Clutches and brakes: Types – Construction and working principle – Applications. [9]

Lecture Hours:45, Tutorial Hours:15, Total Hours: 60

Text Book(s):

1. S. Trymbaka Murthy, "Elements of Mechanical Engineering", 3rd Edition, I. K. International Pvt. Ltd, 2016.
2. J.K.Kittur, G.D.Gokak, "Elements of Mechanical Engineering", Wiley Publications, 2014.

Reference(s):

1. R.K.Rajput, "Elements of Mechanical Engineering", Firewall Media, 2015.
2. Rattan.S.S, "Theory of Machines",Tata McGraw Hill, 2016.
3. Pravin Kumar, "Basic Mechanical Engineering", First Edition, Pearson India Education, 2014.
4. V.Ganesan, "Internal Combustion Engines",Tata McGraw Hill Education, 2012.

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50 ME 008 - Elements of Mechanical Engineering															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2		3			1				3	2		1
CO2	3	2	3		3			1				3	3		1
CO3	3	3	2		3			1				3	3		1
CO4	3	2	3		3			1				3	2		1
CO5	3	3	2		3			1				3	3		1

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Approved in Academic Council Meeting held on 07/01/2023.

50 CH 002 - Chemistry for Textile								
B.Tech Textile Technology								
Semester	Hours / Week			Total hours	Credit	Maximum marks		
	L	T	P	45	C	CA	ES	Total
III	3	0	0		3	50	50	100
Objective(s)	• To help the learners about introduction, reaction and mechanism of polymers. • To familiarize the learners with the physical and chemical properties of polymers. • To enlighten the learners about characterization techniques. • To endow with an overview of auxiliaries and colorants. • To enlighten the methods of fabrication of polymers and preparation, properties and applications of composites.							
Course Outcomes	**At the end of the course, the student will be able to**: 1. Recognize the concepts of polymer and analyses the different polymerization mechanisms and techniques. 2. Relate polymer properties to their structure and conformation. 3. Determine the molecular weight and crystallinity of polymer. 4. Interpret the mechanism and conditions of various bleaching agent and theory for colour of the dye. 5. Analyze the various fabrication methods and properties and applications of fiber reinforced composites.							

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Introduction to Polymer

Terminology – classification - functionality of monomer – degree of polymerization- types of polymerization - addition, condensation and copolymerization - Mechanisms of polymerization - free radical – ionic – co-ordination - Polymerization techniques – bulk – solution – suspension - emulsion. [9]

Properties of Polymer

Structure-property relationship of polymer - Technological function of polymers -fibers, elastomers, plastics - Chemical property - solubility and swelling - chemical reactivity - diffusion and permeability - aging and weathering, electrical property - optical property, mechanical property, strength of polymers - degradation of polymers. [9]

Characterization of Polymer

Molecular weight distribution - number average, viscosity average and weight average. Determination of molecular weight by gel permeation chromatography - Ubbelhode viscometer. Glass transition temperature (Tg) - factors affecting Tg - significance- Crystallinity- degree of crystallinity- factors affecting crystallinity - effects of crystallinity in properties of polymer. Principle - interpretation and applications of DSC, TGA, TMA and DTGA. [9]

Auxiliaries and Colorants

Surfactant: classification and significance. Types of bleaching agents – Reducing bleaching agents – Sulphur dioxide and Sodium hydro sulphite - Oxidising bleaching agents - calcium hypochlorite - hydrogen peroxide - chlorine dioxide - sodium hypochlorite – preparation, bleaching mechanism and conditions of bleaching. Determination of available chlorine in bleaching powder - percentage of hydrogen peroxide. Dyes - Witt's theory of colour and constitution, classification of dyes and applications. [9]

Fabrication of Polymers and Composites

Compounding- Additives for polymer – fillers – plasticizers – lubricants – accelerators – stabilizers - flame retarders – pigments - nucleating agents - blowing agents - adhesives. Fabrication of polymer - injection moulding - extrusion moulding - blow moulding - compression moulding - lamination. Composites – classification - Fiber reinforced plastics- preparation, - properties and applications. [9]

Total Hours: 45

Text Book(s):

1. Gowarikar V.R., Viswanathan N.V and Jayadev Sreedhar, "Polymer Science", New age International (P) Ltd., New Delhi, 2015
2. Fred W. Billmeyer "Textbook of Polymer Science" 3rd Edition, John Wiley& Sons, 2007

Reference(s):

1. Joel R.Fried, "Polymer Science and Technology", Prentice Hall of India Pvt. Ltd., India, 2003.
2. Hiemenz P.C and Lodge T.P, "Polymer Chemistry", 2nd Edition, CRC Press, 2007.
3. Trotman, E.R., "Dyeing and Chemical Technology of Textile Fibres", Charles Griffin and Co. Ltd., London, 2001.
4. Stoyko Fakirov, "Fundamentals of Polymer Science for Engineers", Wiley-VCH VERLAG GMBH & CO. KGAA, 2017.

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50 CH 002 - Chemistry for Textile															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	1	3	3	3	3	1	3	3	3	3	3
CO2	3	3	3	3	3	3	3	2	2	2	3	2	3	3	3
CO3	3	3	3	3	3	3	3	3	2	2	2	2	3	3	3
CO4	3	3	3	3	3	3	3	2	2	2	3	2	3	3	3
CO5	3	3	3	3	3	3	3	3	2	2	2	3	2	3	3

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K.S. Rangasamy College of Technology - Autonomous								R 2018
50 TT 301 - Fibre Science								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
III	3	0	0	45	3	50	50	100

Objective(s)	• To impart knowledge on production of natural and regenerated fibres. • To impart knowledge on applications and properties of natural fibres. • To impart knowledge on applications and properties of regenerated fibres. • To impart knowledge on applications and properties of protein fibres. • To impart knowledge on analysis of various fibres.
Course outcomes	**At the end of the course, the students will be able to** 1. Explain about polymers and classify the textile fibres and its properties. 2. Summarize the cultivation / extraction process, properties and applications of Natural cellulosic fibres and their structure. 3. Explain the manufacturing, properties and applications of regenerated cellulosic fibres and their structure. 4. Summarize the production, properties and applications of protein and other regenerated fibres with their structure and applications of high performance fibres. 5. Explain the Identification of various fibres and blend proportion by various methods.

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Introduction

Definition - staple fibre, filament; classification of textile fibres; High performance fibres. Essential and desirable properties of fibres. Requirements of fibre forming polymers. Types of polymers; intra polymer bonding, inter polymer forces of attraction, degree of polymerization, glass transition temperature. Principle of manmade spinning systems – Dry, Wet, Melt and Gel spinning. [8]

Natural Cellulosic Fibres

Cultivation, properties and applications of cotton; Brief study about BT, coloured and organic cotton. Extraction, properties and application of flax, jute, ramie, hemp, sisal, coir, banana and pine apple fibres. Morphological and chemical structure of natural cellulosic fibres. [10]

Regenerated Cellulosic Fibres

Production, properties and applications of viscose rayon, cuprammonium rayon, acetate rayon, bamboo, modal and lyocell fibres; Study of morphological and chemical structures of regenerated cellulosic fibres. [9]

Protein and other Regenerated Fibres

Morphological structure and chemical constitution of wool and silk. Types, production, properties and applications of wool, silk, soya bean, casein, alginate, chitin and chitosan fibres. Study on spider silk. [12]

Identification of Fibres

Fibre identification- microscope, chemical, burning, feeling, staining, density measurement methods. Determination of blend proportion. Determination of moisture content and moisture regain. [6]

Total Hours: 45

Text book(s):

1. S.P.Mishra, “A Text book of Fibre science and technology”, New age international publishers, Chennai.
2. Morton W.E and Hearle J.W.S, “Physical properties of textile fibres”, Textile Institute, Manchester

Reference(s):

1. Mather.R.R, “The Chemistry of Textile Fibres 2nd Ed” Hardcover publisher, 2015.
2. Gohl, “Textile Science”, 2nd Edition, Paperback Publisher, 2005.
3. Georg Von Georgievic, “ The Chemical Technology of Textile Fibres”, Paperback Publisher, 2007.
4. S. Eichhorn, J.W. S. Hearle, et al.”, “Handbook of Textile Fibre Structure, Volume 1” Woodhead Publishing, 2009.

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50 TT 301 - Fibre Science															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	3							3	1			2		
CO2	3	3	2		3	1			2	1		1	2		1
CO3	2	1	2		2		2		2	2			2		2
CO4	2	2	2		3		2		3	1		1	1		
CO5	2	2			2	1			1			1			

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K.S. Rangasamy College of Technology - Autonomous								R 2018
50 TT 302 - Structure and Properties of Fibers								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
III	4	0	0	60	4	50	50	100

Objective(s)	• To expose the students to the various methods in structural investigation of fibres. • To enable the students to understand the moisture absorption properties of fibres. • To enable the students to understand the mechanical properties of fibres. • To enable the students to understand the optical and frictional properties of fibres. • To enable the students to understand the thermal and electrical properties of fibres.
Course Outcomes	**At the end of the course, the students will be able to** 1. Review the different methods in the investigation of fibres. 2. Describe the moisture absorption properties of fibres. 3. Discuss the concepts of mechanical properties of fibres. 4. Explain the optical and frictional properties of fibres. 5. Outline the thermal and electrical properties of fibres.

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Structural Investigation of Fibres

Basic requirements for fibre formation; Models of fibre structure-fringed micelle, fringed fibril and fringed lamellar models. Investigation of fibre structure by X-ray diffraction, SEM, TEM, STEM, FTIR and NMR. [10]

Moisture Absorption Properties of Fibres

Definitions- humidity, relative humidity, standard testing atmosphere, moisture content and regain; hysteresis in moisture absorption; moisture absorption behaviour of textile fibres; Influence of various factors on regain; absorption in crystalline and amorphous regions.

Heats of sorption-Integral and differential, measurement, effects of heats of sorption; Conditioning of fibres, mechanism of conditioning, factors influencing the rate of conditioning; swelling of fibres, types of swelling and its measurement. [12]

Mechanical Properties of Fibres

Tensile property- definitions related to tensile property; stress strain curves of various textile fibres and its importance, influence of moisture and temperature on tensile characteristics, Weak- link effect.

Elastic recovery and its relation to stress and strain of various textile fibres; Mechanical conditioning of fibres.

Time dependent effects- creep and stress relaxation phenomena; Directional effects – Brief study on flexural and torsional rigidity of fibres. [14]

Optical and Frictional Properties of Fibres

Optical property - Refractive index and its measurement; Birefringence and its measurement; Absorption and dichroism; reflection and lustre of fibres.

Frictional property - Amonton's and Bowden's law of friction, various influencing factors- load, area of contact, speed of sliding, state of surface and regain; directional frictional effect of wool. [12]

Thermal and Electrical Properties of Fibres

Thermal property- structural changes in fibres on heating, thermal transitions and melting; heat setting of fibres and its importance. Electrical property- mass specific resistance; influence of moisture, temperature and impurities on resistance; Dielectric properties-factors influencing dielectric properties of fibre; Static electricity – introduction, problems and elimination techniques. [12]

Total Hours: 60

Text book(s):

1.	Morton W.E. and Hearle J.W.S., "Physical properties of textile fibres", published by The Textile Institute Manchester,U.K., 4th Edition, 2008.ISBN 978-1-84569-220-9.
2.	Meredith R. and Hearle J.W.S., "Physical methods of investigation of textiles", Wiley Publications, Newyork, 1989.

Reference(s) :

1.	Meredith R., "Mechanical Properties of Textile Fibres", North Holland, Amsterdam, 1986.
2.	Mukhopadhyay S.K., "Advances in fibre science", The Textile Institute, Manchester, U.K., 1992.
3.	Gordon cook. J,"Hand book of textile fibres –Vol.I - Natural fibers", Wood Head Publishing Limited, Cambridge-England, 2006.
4.	Sreenivasa Murthy.H.V, "Introduction to Textile Fibers", Revised Edition, Wood Head Publishing India Private Limited, New Delhi.

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50 TT 302 - Structure and Properties of Fibers															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	1	2	2		1			2		2	2	1	
CO2	3	2	1	2	2		1			2		1	2	1	
CO3	3	2	1	2	2		1			2		1	2	1	
CO4	3	2	1	2	2		1			2		1	2	1	
CO5	3	2	1	2	2		1			2		1	2	1	

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K.S.Rangasamy College of Technology – Autonomous								R 2018
50 TT 303 - Yarn Manufacturing Technology I								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
III	3	0	0	45	3	50	50	100

Objective(s)	• To enable the students to learn the theory of various operations carried out at different stages of pre spinning process. • To expose the students to different yarn numbering systems. • To know the influence of various parameters on the quality of yarn and its productivity. • To educate the inter-relationship of the process of conversion of fibers to yarns and the related machinery features. • To know the latest developments, cleaning efficiency and stop motions at different stages of pre spinning process.
Course Outcomes	**At the end of the course, the students will be able to** 1. Describe the mechanism of ginning, its performance on yarn quality, classify yarn numbering systems, the mechanism of blow room machineries and its latest developments. 2. Summarise the principle, mechanism, settings, cleaning efficiency, nep removal and latest developments of carding machine. 3. Discuss the principle, settings, auto levelling and types of drafting systems in modern draw frame. 4. Explain the mechanism of modern comber, timing operation and its preparatory machines. 5. Describe the principle, mechanism, settings and latest developments in speed frame.

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Ginning and Blow Room

Sequence of spinning machinery for Short staple and Long staple spinning. Brief study on Yarn numbering systems. Ginning: preparatory processes for ginning, working of different types of gins; Selection of gins, Effect of ginning performance on yarn quality. Blow room: principle and description of opening, blending and cleaning machines; Mechanism of lap formation; contamination removal; cleaning efficiency and control of nep generation and waste removal; Latest developments in blow room machines. [9]

Carding

Chute feed system. Basics of opening, cleaning and fibre individualization; Working of modern flat cards- speeds, settings and functions of different elements, drives; card clothing and its maintenances; concept of autoleveller in carding; Control of waste, cleaning efficiency; Latest developments in carding. [9]

Drawing

Introduction to doubling/drafting. Principle and working of modern draw frame; working of various types of drafting systems-concept of roller setting, roller weighing system and distribution of draft; Coiling; micro dust collection; web condensation; roller lapping; Stop motions; Concept of autoleveller in draw frame; Latest developments in drawing. [9]

Combing

Preparatory process- Principle and working of sliver lap, ribbon lap and super lap formers; Modern comber: working principle, sequence and timing of operations in combing; comber settings; concept of piecing waves, asymmetric web condensation; Combing efficiency and nep removal efficiency; Latest developments in comber. [9]

Speed Frame

Principle and working of modern speed frame; drafting system - components, their functions and specifications, roller setting, Mechanism of winding and bobbin building - mechanical and electro mechanical; Bobbin lead and flyer lead; Stop motions; Latest developments in speed frame. [9]

Total Hours: 45

Text book(s):

1. Klein W., Vol. 2, “A practical guide to Opening and Carding”, The Textile Institute, Manchester, U.K., 2000.
2. Klein W., Vol. 3, “A practical guide to Combing and Drawing”, The Textile Institute, Manchester, U.K., 1987.

Reference(s) :

1. Klein W., Vol. 1, “The Technology of Short-Staple Spinning”, The Textile Institute, Manchester, U.K., 1998.
2. Chattopadhyay R, Salhotra K.R, “Spinning: Blow room, Carding”, NCUTE Publications, 1998.
3. Chattopadhyay R, Rangasamy R, “Spinning: Drawing, Combing & Roving”, NCUTE Publications, 1999.
4. Pattabhiraman T.K, “Essential Facts of Practical Cotton Spinning”, Mahajan Publishers, Ahmedabad, 2005.

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50 TT 303 - Yarn Manufacturing Technology I														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	1	1			2	1		2	1	2		3	2	
CO2	3	1	1			2	1		3	2	2		3	3	
CO3	3	3	2	2		2	1		3	1	2		2	3	
CO4	3	3	2	2		2	1		3	2	2		2	3	
CO5	3	3	2	1		2	1		1	1	2		2	3	

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K.S.Rangasamy College of Technology – Autonomous								R 2018
50 TT 304 - Fabric Manufacturing Technology I								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
III	3	0	0	45	3	50	50	100

Objective (s)	To impart basic knowledge on • Sequence of operation in warp and weft preparation. • Objectives and principle of preparation of warp winding. • Objectives and principle of preparation of pirn winding. • Objectives and principle of preparation of warping. • Objectives and principle of preparation of sizing and drawing-in.
Course Outcomes	**At the end of the course, the students will be able to** 1. State the sequence of weaving preparatory processes and classification of winding machines. 2. Explain the working principles of various types of winding machines and their production calculation. 3. Describe principle and working of weft winding machines and their production calculation. 4. Explain principle and working of various warping machines and their defects and remedies. 5. Explain the objectives and working principles of sizing machines and drawing –in.

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Introduction

Sequence of operation in warp and weft preparation. Various types of woven fabrics - plain, stripes, checked, dyed, printed and denim; Different types of supply packages; Winding - angle of wind, angle of cone, traverse ratio; classification of winding machines, characteristics of parallel winding, cross winding and precision winding. [6]

Warp Winding

Objects of winding; principles of random and precision winders; working of conventional and modern cone and cheese winding machines; Function of various parts – tension devices, slub catchers, stop motions, types of drum - half accelerated and fully accelerated drums, anti-patterning devices, anti-ballooning devices. Classification of yarn faults and its removal; concepts in yarn clearing – mechanical, optical and electronic yarn clearers; knotters and splicers, clearing efficiency. Air requirements for modern winding machines. Calculations based on winding parameters. [10]

Pirn Winding

Objects and principles of pirn winding; Types of pirn winding machine - modern automatic pirn winders, function of parts. Production calculations in cone, cheese and pirn winding machines. Winding of synthetic and blended yarns, Yarn preparation for hosiery process; Package preparation for dyeing; Winding package faults and remedies - cone, cheese and pirn winding. [9]

Warping

Warping - Objectives; classification of warping machines; working principle of beam warping machine- creel types, stop motion, length measuring motion; working principle of sectional warping machine- creel, stop motion, length measuring motion. Features of modern warping machines; Warping defects - causes and remedies; production calculations in warping machine. [10]

Sizing & Drawing – In

Sizing -Objectives of sizing, sizing ingredients and recipe for various fibres, size paste preparation. Types of sizing machines and its function; marking and measuring motion; Concept of single end sizing. Sizing of blended and filament yarns. Modern developments in sizing. Sizing defects- causes and remedies; Production calculations in Sizing.

Drawing –in - Needs and methods of drawing-in process, leasing, knotting and pinning machines. Selection and care of reeds, healds and drop pins; control of cross ends and extra ends. [10]

Total Hours: 45

Text book(s):

1.	Lord P.R and Mohamed M.H, “Weaving conversion of yarn to fabric”, Wood head Publishers Ltd UK,reprint, 1992, ISBW: 090409538X.
2.	Ajgaonkar D.B., Talukdar M.K. and Wedekar, “Sizing: Material Methods and Machineries”, Mahajan Publications, Ahmedabad, 1999.

Reference(s) :

1.	Sengupta, “Weaving Calculation”, D.P. Taraporewala Sons & Co. Ltd., reprint, 1996.
2.	Ormerod A, “Modern Preparation and Weaving”, Wood head Publishers Ltd UK, reprint, 2004.
3.	Talukdar M.K., “An Introduction to Winding and Warping” Testing Trade Press, Mumbai, 1998.
4.	Marks R. and Robinson T.C., “Principles of Weaving”, The Textile Institute, Manchester,1989, ISBN: 0 900739 258

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50 TT 304 - Fabric Manufacturing Technology I														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	2	2		1	3	2		3	3			2	2	
CO2	2	3	2			3	3		3	1			2		
CO3	2	1	3	2	1	3	3		3	1		1	2	2	
CO4	3		3	3		3	3		3	1		1	3	2	
CO5	2		3	3		3	3		3	1		1	3	2	

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K.S. Rangasamy College of Technology - Autonomous								R 2018
50 TT 3P1 - Fibre Science Laboratory								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
III	0	0	4	60	2	60	40	100
Objective(s)	• To impart knowledge on identification of fibres by physical test. • To impart knowledge on identification of fibres by chemical test. • To impart knowledge on determination of fibre density. • To impart knowledge on determination of moisture regain and moisture content. • To impart knowledge on blending of fibres.							
Course Outcomes	**At the end of the course, the students will be able to** 1. View the given fibre using microscope and identify the textile fibres. 2. Identify the given fibre by burning test and solubility test. 3. Evaluate the fibre maturity using caustic soda swelling method. 4. Compute the amount of spin finish in synthetic fibres. 5. Calculate fibre blend proportion of the given sample by solubility method.							

List of Experiments

1. Identification of fibres by microscopic view using projection microscope.
2. Identification of fibres by flammability characteristics (Burning test) of fibers.
3. Identification of fibers by solubility tests.
4. Determination of fibre maturity using caustic soda swelling method.
5. Determination of moisture regain and moisture content of fibers.
6. Estimation of percentage of spin finishes in synthetic fibers through Soxhlet extraction.
7. Determination of blend proportion of P/C blends by solubility method.
8. Determination of blend proportion of C/V blends by solubility method.
9. Determination of blend proportion of P/V blends by solubility method.
10. Determination of blend proportion of P/W blends by solubility method.

Total Hours: 60

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50 TT 3P1 - Fibre Science Laboratory															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	1	3	2	2						1			1		
CO2	2	3	2							1			1		
CO3	3	2	2	1						1		1	1		1
CO4	2	2	2							1					
CO5	2	2	2							1			1		

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K.S.Rangasamy College of Technology - Autonomous								R 2018
50 TT 3P2 - Yarn Manufacturing Technology Laboratory I								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
III	0	0	4	60	2	60	40	100

Objective(s)	• To enable the students to handle the preparatory machines and operate them practically. • To impart knowledge the students to learn material passage and parts of spinning preparatory machines. • To develop the students to calculate the production of various preparatory machine. • To make the students to know about optimum settings on various mechanism of preparatory machine based on the process variables. • To know the draft, draft constant, twist, twist constant, production and working of building mechanism in speed frame.
Course Outcomes	**At the end of the course, the students will be able to** 1. Explain the basic working mechanism of ginning machine and calculate the speed of ginning machine. 2. State the principle of opening, cleaning and mixing of fibres in blow room, mechanism of lap formation in scutcher. 3. Practice the working of cards with optimum settings and production, draft calculation. 4. Set the settings and practice the working of draw frame and production, draft calculation. 5. Demonstrate the working of comber, modern speed frame machine, its building mechanism and production, draft calculation.

List of Experiments

1. Passage of material through double roller McCarthy ginning machine and calculation of the speeds.
2. Passage of material through blow room.
3. Calculation of speed, production and cleaning efficiency in blow room.
4. Passage of material through carding machine, production of sliver and calculation of hank of sliver, draft, production in carding machine.
5. Measurement of settings between various carding elements in carding machine.
6. Passage of material through draw frame, production of sliver and testing of drawn sliver hank. Calculation of draft and production in draw frame.
7. Passage of material through comber and settings in comber.
8. Passage of material through speed frame, production of roving and testing of roving hank.
9. Calculation of twist, twist constant, draft and production in speed frame.
10. Study of builder motion mechanism in speed frame.

Total Hours: 60

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50 TT 3P2 - Yarn Manufacturing Technology Laboratory I															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	1	1								3		3	2	
CO2	3	3	1								2		2		
CO3	3	3	2								2		3	2	
CO4	3	1	2								2		3	2	
CO5	3	1	2								2		2	2	

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Department	**Textile Technology**	**Programme Code & Name**			**TT: B.Tech. Textile Technology**			
Semester III								
Course Code	**Course Name**	**Hours/Week**			**Credit**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CA**	**ES**	**Total**
50 TP 0P1	**Career Competency Development I**	**0**	**0**	**2**	**0**	**100**	**00**	**100**

Objective(s)	• To help learners to enrich their grammatical correctness and vocabulary efficacy in the academic and professional contexts. • To help the learners to frame syntactical structures of sentences and comprehend the meaning of reading passages effectively • To help learners to adeptly sequence the information, draft letters and correct usage of foreign words with correct spelling and punctuation. • To help the learners to introduce themselves and involve in situation conversations professionally • To help learners to make various modes of presentations and express their opinion in a conducive way.
Course Outcomes	**At the end of the course, the student will be able to** 1. Reinforce the essential grammatical correctness and vocabulary efficacy in the academic and professional contexts 2. Generate syntactical structures and infer the semantics in the reading passages effectively 3. Reorganize and compose the sequential information, letter drafts, and interpret the appropriate usage of foreign words with correct spelling and punctuation 4. Demonstrate their introduction and relate to situational conversations adeptly 5. Exhibit various modes of presentations and organize their opinions in an expressive way

Unit – 1	**Written Communication – Part 1**	**Hrs**
Usage of noun, pronoun, adjective (Comparative Forms), Verb, Adjectives, Adverb, Tenses, Articles and Preposition - Change of Voice - Change of Speech - Synonyms & Antonyms - One Word Substitution - Using the Same Word as Different Parts of Speech - Odd Man Out **Materials:** Instructor Manual, Word Power Made Easy Book		8
Unit – 2	**Written Communication – Part 2**	6
Analogies - Sentence Formation - Sentence Completion - Sentence Correction - Idioms & Phrases - Jumbled Sentences, Letter Drafting (Formal Letters) - Reading Comprehension(Level 1) - Contextual Usage - **Materials:** Instructor Manual, Word Power Made Easy Book		
Unit – 3	**Written Communication – Part 3**	4
Jumbled Sentences, Letter Drafting (Formal Letters) - Foreign Language Words used in English - - Spelling & Punctuation (Editing) **Materials:** Instructor Manual, News Papers		
Unit – 3	**Oral Communication – Part 1**	6
Self Introduction - Situational Dialogues / Role Play (Telephonic Skills) - Oral Presentations- Prepared -'Just A Minute' Sessions (JAM) **Materials:** Instructor Manual, News Papers		
Unit – 5	**Oral Communication – Part 2**	6
Describing Objects / Situations / People, Information Transfer - Picture Talk - News Paper and Book Review **Materials:** Instructor Manual, News Papers		
	Total	**30**

Evaluation Criteria

S.No.	Particular	Test Portion	Marks
1	Evaluation 1 Written Test	50 Questions – 30Questions from Unit 1 & 2, 20 Questions from Unit 5, (External Evaluation)	50
2	Evaluation 2 Oral Communication 1	Self Introduction, Role Play & Picture Talk from Unit-3 (External Evaluation by English and MBA Dept)	30
3	Evaluation 3 Oral Communication 2	Book Review & Prepared Speech from Unit-4 (External Evaluation by English and MBA Dept)	20
		Total	**100**

Reference Books

1. Aggarwal, R.S. “A Modern Approach to Verbal and Non-verbal Reasoning”, Revised Edition 2008, Reprint 2009, S.Chand & Co Ltd., New Delhi.

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2. Word Power Made Easy by Norman Lewis W.R. GOYAL Publications

Note :

- Instructor can cover the syllabus by Class room activities and Assignments(5 Assignments/week)
- Instructor Manual has Class work questions, Assignment questions and Rough work pages
- Each Assignment has 20 questions from Unit 1, 2 and Unit 5 and 5 questions from Unit 3 and 4
- Evaluation has to be conducted as like Lab Examination.

COURSE CODE & COURSE NAME	CO	PO												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
50TP0P1– Career Competency Development I	CO1	1	1	1	1		2	1	2	3	3	2	3	1		2
	CO2	1	1	1	1	1	2	1	2	3	3	3	3	2	1	3
	CO3	1	1	1	1	1	2	1	2	3	3	2	3	2	1	3
	CO4	1	1	1	1		2	1	1	2	3	2	3	1	2	3
	CO5	1	1	1	1	1	2	1	2	3	3	2	3	2	2	3

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IV Semester

K.S.Rangasamy College of Technology - Autonomous								R 2018
50 MA 012 - Statistics for Textile Industry								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	3	1	0	60	4	50	50	100

Objective(s)	• To acquire skills in handling situations involving random variable • To familiarize with the various methods in hypothesis testing • To monitor a process and detect a situation when the process is out of control • To understand the concept of analysis of variance and use it to investigate factorial dependence • To construct an appropriate model using time series approach
Course Outcomes	**At the end of the course, the students will be able to** 1. Acquire the knowledge of probability and random variable and apply probability distributions in engineering problems 2. Test the statistical hypothesis using normal, t and F distributions and goodness of fit using chi-square test 3. Measure the relationship between two variables and construct and interpret quality control charts 4. Analyze the variance of factors using CRD and RBD and LSD 5. Know the components of time series and methods to measure the trend and construct the time series for moving averages

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Probability and Distributions

Probability (basic concepts) – Probability distributions – Properties of random variable – Moment generating function – Standard distributions – Binomial, Poisson, Weibull and Normal distributions – properties [9]

Testing of Hypothesis

Application of Normal distribution for testing mean and proportion – Applications of t, F and χ^2 distribution for testing mean and variance – Goodness of fit – Independence of attributes – Non-parametric test: Mann-Whitney U- test, Kruskal-Wallis (or H test), Test of Concordance [10]

Correlation and Control Charts

Correlation and Regression (discrete) – Control charts – $\overline{X}$ chart – R chart – np chart – p chart – C chart – AQL chart [8]

Design of Experiments

One way classification – Completely randomized design – Two way classification – Randomized block design – Latin square design– 2^2 factorial design [9]

Time Series

Components of time series – Measurement of trend – Methods of least square: $Y = a + bX$, $Y = a + bX + cX^2$, $Y = ab^X$ trends – Method of semi-averages – Method of moving averages (3 and 5 years) [9]

Lecture Hours:45, Tutorial Hours:15, Total Hours: 60

Text book(s):

1	Nagla J.R., “Statistics for Textile Engineers”, Wood head Publishing India Limited, New Delhi, 2014
2	Leaf G.A.V., “Practical Statistics for the Textile Industry: Part I and Part II”, The Textile Institute, UK, 1984

Reference(s):

1	Montgomery D.C., “Introduction to Statistical Quality Control”, John Wiley & Sons Inc., Singapore, 6th edition, 2009
2	Hayavadana J., “Statistics for textiles and apparel management”, Wood head Publishing India Limited, New Delhi, 2012
3	P.N.Arora, S.Arora., “Statistics for Management”, S.Chand and Company Limited,5th edition, 2009
4	Johnson R.A. and Gupta C.B., “Miller and Freund’s Probability and Statistics for Engineers”, Pearson India Education, Asia, 9th Edition, New Delhi, 2017

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50 MA 012 - Statistics for Textile Industry															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	2	3	2				2	2	3	3	2
CO2	3	3	3	3	2	3	2				2	2	3	3	2
CO3	3	3	3	3	2	2	2				2	2	3	3	2
CO4	3	3	3	3	2	2	2				2	2	3	3	2
CO5	3	3	3	3	2	3	2				2	2	3	3	2

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K.S.Rangasamy College of Technology - Autonomous								R 2018
50 TT 401 - Yarn Manufacturing Technology II								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	3	0	0	45	3	50	50	100

Objective(s)	• Theory of yarn formation by different spinning systems. • Effect of process parameters used in the spinning system on yarn quality. • Principles and mechanism of advanced spinning systems. • Provide the knowledge method of yarn plying and calculation of resultant count. • Raw material requirement, yarn structure and preparation of different types of yarn.
Course Outcomes	**At the end of the course, the students will be able to** 1. Describe the mechanism and working principles of various parts of ring frame and compact spinning, compare the properties of compact yarn with ring yarn. 2. Discuss the raw material requirement, yarn structure and preparation for rotor spinning, summarizes its working mechanism. 3. Discuss the raw material requirement, yarn structure and preparation for friction spinning, summarizes its working mechanism. 4. Describe the principle of yarn production in self twist, wrap, core, siro and solo spinning systems. 5. Summarize the twist level, methods of plying and count calculation in ply yarn and discuss the fancy yarn production.

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Ring and Condensed Yarn Spinning

Principles and working of ring spinning machine; drafting system- components, their functions and specifications, roller settings; functions of yarn guide, balloon control ring, separators; types of rings and travellers; spindle and drives. Working principle of builder motion; auto doffing mechanism; control of end breakage rate; power consumption; control of hard waste. Latest developments in ring spinning.

Principle of compacting, different methods of condensed yarn manufacture, comparison of condensed yarn properties with that of ring yarn, applications. [10]

Rotor Spinning

Raw material requirement and preparation; principle of operation - feeding, opening, cleaning, drafting, twisting and winding; process parameters influencing spinning performance and yarn quality; yarn structure, properties of ring and rotor spun yarns; limitations; applications, Latest developments in rotor spinning. [9]

Friction Spinning

Principle of opening, cleaning, drafting, twisting and winding in DREF II and DREF III spinning; structure, properties and applications of friction spun yarns. [8]

Other Spinning Systems

Air-Jet and Air-Vortex Spinning**-** Principles of drafting, twisting and winding in air-jet and air-vortex spinning; structure, properties and applications of air-jet and air-vortex yarns.

Principle of yarn production in self-twist, wrap, core, siro and solo spinning systems. Properties and applications. [10]

Yarn Plying and Fancy Yarns

Merits of plying; methods of plying-TFO, ring twisting; selection of twist level for plying; calculation of resultant count of plied yarns; Fancy yarns-types and production methods, applications. [8]

Total Hours: 45

Text book(s):

1. Klein W., Vol. 4 & 5, “A Practical Guide to Ring Spinning” and “New Spinning Systems" The Textile Institute, Manchester, 1987.
2. Mahendra Gowda, “New Spinning Systems”, NCUTE Publications, 2006.

Reference(s) :

1. Lawrence C.A. and Chen K.Z, “Rotor Spinning”, Textile Progress, Vol. 13, No.4, Textile Institute, U.K., 1981.
2. Carl A.Lawerence, “Fundamentals of Spun Yarn Technology”, CRC Press, 2003.
3. Lord P.R., “Handbook of yarn production”, Wood Head publishing, 2003.
4. Salhotra K.R, Alagirusamy, Chattopadhyay R, “Ring Spinning, Doubling and Twisting”, NCUTE Publications 2000.

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50 TT 401 - Yarn Manufacturing Technology II															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	1	1								3		2	1	
CO2	3	3	1								3		2	1	
CO3	3	3	2								3		2	1	
CO4	3	1	2								3		2	1	
CO5	3	1	2								3		2		

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K.S. Rangasamy College of Technology - Autonomous								R 2018
50 TT 402 - Fabric Manufacturing Technology II								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	3	0	0	45	3	50	50	100

Objective(s)	• To impart basic knowledge in the concepts involved in various mechanisms used in weaving • To train on the aspects of different mechanisms in loom. • To educate on the features of jacquard, dobby and drop box mechanism. • To make the students understand the selection and control of process variables during fabric formation. • To give the knowledge about the different shuttleless looms.
Course Outcomes	**At the end of the course, the students will be able to** 1. Explain the functioning of weaving machine and its parts. 2. Comprehend the various types of shedding mechanism and its requirements. 3. Demonstrate knowledge of primary and secondary motions of weaving machines. 4. Acquire the knowledge of Auxiliary motion, drop box and terry mechanism. 5. Describe requirements and weft insertion principles of different shuttleless looms.

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Introduction

Weaving – Principles of weaving, Classification of looms, passage of material through a loom, Types of weaving motions - primary, secondary and auxiliary motions. Loom timing diagram for different motions. Driving of plain power loom; Yarns quality requirements for different types of shuttle looms; Weaving accessories- Types and function of heald wires, heald frames, reeds, shuttle, picker, Temples. [8]

Shedding

Shedding – Types of shed, Shedding mechanisms - positive and Negative. Principle and types of tappet, dobby and jacquard mechanism. Tappet shedding – positive and negative. Dobby shedding- climax, cross-border, cam and electronic dobby, designing and pegging. Jacquard shedding - Single lift, Double lift, Cross-border and electronic jacquard. Harness mounting, card punching. Reversing mechanism and limitations of shedding mechanism. [10]

Picking, Beat up and Secondary Motion

Picking: Cone over pick, Under pick: side lever and side shaft - Shuttle flight and timing, Checking Devices, swell checking and hydraulic swell checking; check straps. Beat-up –4 bar linkage beat up mechanism, cam beat up mechanism. Kinematics of sley, sley eccentricity and loom timing diagram. Take up motion: Negative - positive - continuous. Let-off motion: Negative - Positive - Electronic. Types of Back rest. [9]

Auxiliary Motions

Weft stop motion – different types and feelers , side weft fork and centre weft fork mechanisms; warp protector mechanism - loose reed and fast reed; warp stop motion – mechanical and electrical; shuttle changing mechanism; cop changing mechanism; Drop box mechanism - 2x1, 4x1 and 4 x 4. Terry mechanism – principle and types – loose reed terry and fast reed terry mechanism. [9]

Shuttleless Loom

Yarn quality requirements for shuttleless loom; weft preparation for shuttleless loom; weft insertion principle of shuttleless looms in projectile, rapier, air jet, water jet and multiphase looms; weft accumulators; types of selvedges; techno-economics of shuttleless loom; weaving of blended yarns and filament yarns. [9]

Total Hours: 45

Text book(s) :

1. Talukdar M.K., Sriramulu P.K. and Ajgaonkar D.B., “Weaving: Machines, Mechanisms, Management”, Mahajan Publishers, Ahmedabad, 1998, ISBN: 81-85401-16-0
2. Marks R. and Robinson T.C., “Principles of Weaving”, The Textile Institute, Manchester,1989, ISBN: 0 900739 258

Reference(s) :

1. Lord P.R. and Mohamed M.H., “Weaving: Conversion of Yarn to Fabric”, Merrow Publications, 1992.
2. Ormerod, “Modern Preparation and Weaving”, Butterworths & Co. Ltd., 1983.
3. “Woven Fabric production-I (The Plain Power Loom), Woven fabric Production-II (Dobby, Drop box, Jacquard and Terry Looms)”, NCUTE Publications.
4. Sengupta, “Weaving Calculation”, D.P. Taraporewala Sons & Co. Ltd., Reprint, 1996.

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50 TT 402 - Fabric Manufacturing Technology II															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	1	1			1				2			2	2	
CO2	2	3	2			2				1			2	-	
CO3	2	2	1			1				1			2	2	
CO4	2	3			2	1				2			3	2	
CO5	3	2	3	2		2				1			3	2	

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K.S.Rangasamy College of Technology - Autonomous								R 2018
50 TT 403 - Textile Chemical Processing I								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	3	0	0	45	3	50	50	100

Objective(s)	• To impart technical knowledge on desizing and scouring process. • To impart technical knowledge on bleaching and mercerizing process. • To impart technical knowledge on cellulosic material dyeing process. • To impart technical knowledge on synthetic material dyeing process. • To impart knowledge on the construction and working principles of wet processing and machineries.
Course Outcomes	**At the end of the course, the students will be able to** 1. Explain the wet process sequences for various fabrics and summarize the pretreatment processes and their efficiency for cotton, wool and silk material. 2. Describe the objectives and types of bleaching and mercerization of different materials also evaluate their efficiency and select suitable chemicals and other auxiliaries. 3. Explain the classification and applications of various dyes and analyze their fastness properties. 4. Summarize the principle of dyeing of synthetic fibres with various techniques. 5. Demonstrate the working principles involved in preparatory and dyeing machineries.

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Desizing and Scouring

Wet process sequences for cotton, wool, silk, jute, polyester and blended fabrics (P/C, P/V).

Desizing: Desizing methods, enzymatic desizing-mechanism and process conditions, desizing efficiency.

Scouring: mechanism and machines, process conditions and scouring efficiency. Wool carbonizing and degumming of silk. [8]

Bleaching and Mercerizing

Bleaching: Hypochlorite and hydrogen peroxide bleaching - effect of process parameters; per-acidic, sodium chlorite, ozone, enzymatic bleaching; batch, semi-continuous and continuous processes; continuous scouring and bleaching machines; bleaching of viscose/linen, cotton/viscose, and polyester/cotton blends; evaluation of bleaching process.

Mercerization: objectives, methods, process conditions and their effects; yarn mercerizer; fabric mercerizing machine – chain, chainless and circular; evaluation of mercerizing process. [10]

Dyeing of Cellulose Fibres and Protein Fibres

Classification of Dyes, Pigments and their properties; Dye selection, Theory of dyeing. Affinity and Substantivity of dyes. Dyeing mechanism of cellulosic materials with direct dyes, reactive dyes and vat dyes. Dyeing mechanism of wool and silk materials with acid dyes. Wash, rub and light fastness measurements. [9]

Dyeing of Synthetic Fibres

Mass coloration of synthetic fibres. Dyeing of polyester with Disperse dyes - Carrier, HTHP and Thermosol dyeing methods. Dyeing of nylon and acrylic fabrics with cationic dyes. Dyeing of elastomeric fibres and dyeing of blends. [8]

Dyeing Machineries

Mechanical and economic aspects of fibre, yarn, and fabric processing machines; scouring, bleaching and dyeing machines -loose stock, bale, hank, package, jigger, winch, soft flow, soft-over flow, air flow machines; padding mangles; garment dyeing machines- paddle, rotary drum, tumbler, jet dyeing. [10]

Total Hours: 45

Text book(s):

1.	Trotman, E.R., “Dyeing and Chemical Technology of Textile Fibres”, Charles Griffin and Co. Ltd., London. 2001.
2.	Bhagwat R.S “Handbook of Textile Processing Machinery”, Colour Publication, Mumbai, 1999.

Reference(s) :

1.	Kesav V.Datye and A.A.Vaidya, “Chemical processing of synthetic fibers and Blends”, John wiley & Sons, 2004.
2.	Bhagwat R.S “Handbook of Textile Processing”, Colour Publication, Mumbai, 1999.

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3.	T.L.Vigo, “Textile Processing and Properties”, Elsevier, New York, 1994.
4.	L. Ashok Kumar and M Senthil kumar, “Automation in Textile Machinery: Instrumentation and Control System Design Principles”, 2018.

50 TT 403 - Textile Chemical Processing I														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	3									3	2	
CO2	3	3	2	3									3	2	
CO3	3	3	2	3									3	2	
CO4	3	2	2	3	2								3	3	
CO5	3	3	2	3					2	2			3	3	

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K.S.Rangasamy College of Technology-Autonomous								R 2018
50 MY 014 Start-ups and Entrepreneurship								
Common to all branches								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	2	0	0	30	-	100	--	100

Objective(s)	• To provides practical proven tools for transforming an idea into a product or service that creates value for others. • To build a winning strategy, how to shape a unique value proposition, prepare a business plan • To impart practical knowledge on business opportunities • To inculcate the habit of becoming entrepreneur • To know the financing, growth and new venture & its problems
Course Outcomes	**At the end of the course, the students will be able to** 1. Transform ideas into real products, services and processes, by validating the idea, testing it, and turning it into a growing, profitable and sustainable business. 2. Identify the major steps and requirements in order to estimate the potential of an innovative idea as the basis of an innovative project. 3. Reach creative solutions via an iteration of a virtually endless stream of world-changing ideas and strategies, integrating feedback, and learning from failures along the way. 4. Apply the 10 entrepreneurial tools in creating a business plan for a new innovative venture. 5. Apply methods and strategies learned from interviews with startup entrepreneurs and innovators.

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Introduction to Entrepreneurship & Entrepreneur:

Meaning and concept of Entrepreneurship, the history of Entrepreneurship development, Myths of Entrepreneurship, role of Entrepreneurship in Economic Development, Agencies in Entrepreneurship Management and Future of Entrepreneurship.

The Entrepreneur*:* Meaning, the skills required to be an entrepreneur, the entrepreneurial decision process, Role models, Mentors and Support system. [6]

Business Opportunity Identification and Preparing a Business Plan:

Business ideas, methods of generating ideas, and opportunity recognition, Idea Generation Process, Feasibility study, preparing a Business Plan: Meaning and significance of a business plan, components of a business plan. [6]

Innovations:

Innovation and Creativity - Introduction, Innovation in Current. Environment, Types of Innovation, School of Innovation, Analysing the Current Business Scenario, Challenges of Innovation, Steps of Innovation Management, Experimentation in Innovation Management, Participation for Innovation, Co-creation for Innovation, Proto typing to Incubation. Blue Ocean Strategy-I, Blue Ocean Strategy-II. Marketing of Innovation, Technology Innovation Process. [6]

Financing & Launching the New Venture:

Importance of new venture financing, types of ownership, venture capital, types of debt securities, determining ideal debt-equity mix, and financial institutions and banks.

Launching the New Venture: Choosing the legal form of new venture, protection of intellectual property, and formation of the new venture. [6]

Managing Growth & Rewards in New Venture:

Characteristics of high growth new ventures, strategies for growth, and building the new ventures.

Managing Rewards: Exit strategies for Entrepreneurs, Mergers and Acquisition, Succession and exit strategy, managing failures – bankruptcy. [6]

Total Hours: 30

Text book(s):

1. Robert Mellor, Entrepreneurship for Everyone: A Student Textbook, SAGE Publications Ltd; First edition (26 December 2008, Pages: 256 pages
2. David S. Landes; Joel Mokyr; William J. Baumol, The Invention of Enterprise: Entrepreneurship from Ancient Mesopotamia to Modern Time, Princeton University Press, 2010

Reference(s) :

1. Philip Auerswald, “The Coming Prosperity: How Entrepreneurs Are Transforming the Global Economy”, Oxford University Press, 2012.
2. Janet Kiholm Smith; Richard L. Smith; Richard T. Bliss, “Entrepreneurial Finance: Strategy, Valuation, and Deal Structure”, Stanford Economics and Finance, 2011
3. Edward D. Hess, “Growing an Entrepreneurial Business: Concepts and Cases”, Stanford Business Books, 2011
4. Howard Love, “The Start-Up J Curve: The Six Steps to Entrepreneurial Success”, Book Group Press 2011

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50 MY 014 Start-ups and Entrepreneurship															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	1	3	1	2	1		2	2	2	1	
CO2	2	3	3	2	2		2	2	2		2	2	3		
CO3	3	2	3	1	2				1	3	1	3	3		
CO4	3	3	3	3	3	2	2	1		1	3	3	3		
CO5	3	2	3	3	3			2			3	2	2		

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K.S.Rangasamy College of Technology – Autonomous R2018								
50 MY 004 - Universal Human Values								
Semester	Hours / Week			Total Hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	2	1	0	45	3	50	50	100

Objective(s)	• To identify the essential complementarily between 'values' and 'skills' • To ensure core aspirations of all human beings. • To achieve holistic perspective towards life and profession • To acquire ethical human conduct, trustful and mutually fulfilling human behaviour • To enrich interaction with Nature.
Course Outcomes	**At the end of the course, the students will be able to** CO1: Become more aware of themselves, and their surroundings. CO2: Responsible in life, and in handling problems with sustainable solutions CO3: Maintain human relationships and human nature CO4: Committed towards human values, human relationship and human society CO5: Improve critical ability and apply it day-to-day life

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Introduction to value Education **[6+3]**

Understanding value Education-Self exploration as the process for value education-Continuous Happiness and prosperity-the basic human aspirations-right understanding-relationship and physical facility –happiness and prosperity - current scenario – method to fulfill the basic human aspirations

Harmony in the Human Being **[6+3]**

Understanding Human being as the Co-Existence of the self and the Body-Distinguishing between the needs of the self and the body-the body as an instrument of the self-understanding harmony in the self-harmony of the self with the body – programme to ensure self-regulation and health

Harmony in the Family and Society **[6+3]**

Harmony in the Family –the basic unit of human interaction-values in human- to - human relationship –'Trust' the foundation value in relationship –'Respect'- as the right evaluation-understanding harmony in the society – vision for the universal human order.

Harmony in the Nature/Existence **[6+3]**

Understanding harmony in the Nature-Interconnectedness, self-regulation and mutual fulfillment among the four orders of nature – realizing existence as co-existence at all levels –the holistic perception of harmony in existence.

Implications of the Holistic Understanding **[6+3]**

Natural Acceptance of human values- definitiveness of human conduct- a basis for humanistic education, humanistic constitution and universal human order- competence in professional ethics –holistic technologies, production systems and management models-typical case studies – strategies for transition towards value base life and profession

Lecture Hour: 30 Tutorial Hours: 15 Total Hours: 45

Text Book(s):

1.	A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-47-1
2.	Teachers' Manual for A Foundation Course in Human Values and Professional Ethics, R R Gaur, R Asthana, G P Bagaria, 2nd Revised Edition, Excel Books, New Delhi, 2019. ISBN 978-93-87034-53-2

Reference(s)

1.	Jeevan Vidya: EkParichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2.	Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004.

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50 MY004 – Universal Human Values															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	2	2	3	3	3	2	3	3	1			
CO2	3	3	3	2		3	3	3	2	3	2	1			
CO3	3	3	2			3	3	3	3	3	2	1			
CO4	3	3	3			3	3	3	3	3	2	2			
CO5	3	3	1			3	3	3	3	3	2	2			

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K.S.Rangasamy College of Technology - Autonomous								R 2018
50 TT 4P1 - Yarn Manufacturing Technology Laboratory II								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	0	0	4	60	2	60	40	100

Objective(s)	• To enable the students to learn material passage in the machine. • To know the important parts of machines, draft, twist and production calculations in spinning machines. • To train the students to handle machine and operate them practically. • To make the students to know about optimum settings on various mechanism of spinning machine based on the process variables. • To Know the production and characteristics of fancy yarns and doubled yarn
Course Outcomes	**At the end of the course, the students will be able to** 1. Demonstrate the working of ring spinning frame and builder motion Calculate the speed and production of ring spinning frame. 2. Calculate the twist and set the machine variables in ring spinning frame. 3. Select optimum process variables and produce two ply yarn using two-for-one twister. and calculate the twist and production of two-for-one twister. 4. Produce fancy yarns on two-for-one twister. Set the variables and produce quality yarns using open end spinning machine. 5. Calculate the twist and production of rotor spinning machine and production of multiply yarns.

LIST OF EXPERIMENTS

1. Passage of material through ring frame, production of yarn and testing of yarn count.
2. Different settings in ring frame and selection of ring travellers.
3. Calculation of twist, twist constant, draft and production in ring frame.
4. Study of builder mechanism in ring frame.
5. Passage of material through open end spinning machine, production of yarn and testing of yarn count.
6. Calculation of production and twist in open end spinning.
7. Passage of material through ring doubling machine, production of yarn and testing of yarn count. Process sequence for production of sewing threads.
8. Passage of material through Two-For-One twister (TFO), production of ply yarn and measurement of ply yarn count. Calculation of twist in TFO.
9. Production and quality characterization of two-fold yarns.
10. Production of fancy yarns using fancy doublers.

Total Hours: 60

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50 TT 4P1 - Yarn Manufacturing Technology Laboratory II															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	1	1										2	2	
CO2	3	3	1								2		2	3	
CO3	3	3	2								3		2	3	
CO4	3	1	2								3		3	3	
CO5	3	1	2								2		3	3	

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K.S. Rangasamy College of Technology - Autonomous								R 2018
50 TT 4P2 - Fabric Manufacturing Technology Laboratory								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	0	0	4	60	2	60	40	100

Objective(s)	• To develop skills in the operation and maintenance of weaving preparatory machines. • To develop practical knowledge of dismantling, assembling and setting of basic weaving mechanisms. • To prepare the pattern card for a given design. • To develop the design using drop box mechanism. • To know about the working principles of circular weft knitting machine.
Course Outcomes	**At the end of the course, the students will be able to** 1. Set the optimum process variables and carry out winding using supply package winding machine and calculate the production. 2. Practice dismantling, assembling and setting of primary motions. 3. Perform dismantling, assembling and setting of secondary motions. 4. Perform dismantling, assembling and setting of auxiliary motions. 5. Comprehend the production in circular weft knitting machine.

LIST OF EXPERIMENTS

1. (a) Passage of material through the cone winding machine. Setting of tensioners and slub catchers in cone winding machine. Calculation of drum speed, traverse speed, production in cone winding machine.
   (b) Passage of material through the pirn winding machine. Calculation of production in pirn winding machine.
2. Passage of material through sectional warping machine.
3. Dismantling and assembling of tappet shedding mechanism in plain power loom.
4. Dismantling and assembling of cone over pick / under pick mechanism and study the adjustment of picking force.
5. Dismantling and assembling of beat –up mechanism and calculation of sley eccentricity.
6. Dismantling and assembling of negative let-off mechanism and adjustment of warp tension.
7. Dismantling and assembling of seven wheel take-up mechanism and calculation of dividend.
8. (a) Dismantling and assembling of weft stop motion.
   (b) Dismantling and assembling of warp stop motion.
9. Designing of pegging plan on wooden lags and preparation of punched card for 4x4 drop box mechanism for a given design.
10. Material passage and production calculation for single jersey / rib / interlock weft knitting machine.

Total Hours: 60

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50 TT 4P2 - Fabric Manufacturing Technology Laboratory															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2			3			3	1	2		1	1	
CO2	3	3	2			3			2	2	3			2	
CO3	3	3	2	2		3			2	1	3		1		
CO4	3	3	2	2		3			2	2	3		1		
CO5	3	2	3	3		3			2	1	3		1	2	

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K.S.Rangasamy College of Technology - Autonomous							R 2018
Department	**Textile Technology**	**Programme Code & Name**			**TT : B.Tech. Textile Technology**		
Semester IV							
Course Code	**Course Name**	**Hours/Week**			**Credit**	**Maximum Marks**	
		L	**T**	**P**	**C**	**CA**	**ES**	**Total**
50 TP 0P2	**Career Competency Development II**	**0**	**0**	**2**	**0**	**100**	**00**	**100**

Objective(s)	• To help the learners to paraphrase the reading passages, to draft continuous writing and review texts in the academic and professional contexts • To help the learners to acquire the phonetic skills of the language and express themselves precisely for effective professional presentations • To help the learners to enrich their verbal reasoning and ability to match the employability requirements of the corporates • To help the learners to comprehend the preliminary level of aptitude skills required to attend placement and competitive online exams • To help the learners to comprehend the Pre - Intermediate level of aptitude skills required to attend placement and competitive online exams
Course Outcomes	**At the end of the course, the student will be able to** 1. Interpret and infer the meaning in the reading passages, organize continuous writing and review texts both academically and professionally. 2. Adapt to and demonstrate the phonetic skills accurately for effective presentations professionally. 3. Interpret the various concepts of verbal reasoning and relate for the concepts to the requirements of the competitive exams and employability 4. Infer the concepts of preliminary level of aptitude skills pertaining to competitive exams and company recruitments. 5. Infer the concepts of pre-intermediate level of aptitude skills pertaining to competitive exams and company recruitments.

Unit – 1	**Written Communication – Part 3**	**Hrs**
	Reading Comprehension Level 2 (Paraphrasing Poems) - Letter Drafting - Email Writing - Paragraph Writing - News paper and Book Review Writing - Skimming and Scanning - Interpretation of Pictorial Representations. **Practices:** Sentence Completion - Sentence Correction - Jumbled Sentences - Synonyms & Antonyms - Using the Same Word as Different Parts of Speech - Editing **Materials:** Instructor Manual, Word power Made Easy Book, News Papers	6
Unit – 2	**Oral Communication – Part 3**	
	Self Introduction - Miming (Body Language) - Introduction to the Sounds of English - Vowels, Diphthongs & Consonants, Introduction to Stress and Intonation - Extempore - News Paper and Book Review - Technical Paper Presentation. **Material:** Instructor Manual, News Papers	4
Unit – 3	**Verbal Reasoning – Part 1**	
	Analogies - Alphabet Test - Theme Detection - Family Tree - Blood Relations (Identifying relationships among group of people) - Coding & Decoding - Situation Reaction Test - Statement & Conclusions **Material:** Instructor Manual, Verbal Reasoning by R.S.Aggarwal	8
Unit – 4	**Quantitative Aptitude – Part 1**	
	Problem on Ages - Percentages - Profit and Loss - Simple & Compound Interest - Averages - Ratio, Proportion **Material:** Instructor Manual, Aptitude Book	6
Unit – 5	**Quantitative Aptitude – Part 2**	
	Speed, Time & Work and Distance - Pipes and Cisterns - Mixtures and Allegations - Races - Problem on Trains - Boats and Streams **Practices** : Puzzles, Sudoku, Series Completion, Problem on Numbers **Material:** Instructor Manual, Aptitude Book	6
	Total	**30**

Evaluation Criteria

S.No.	Particular	Test Portion	Marks
1	Evaluation 1 Written Test	15 Questions Each from Unit 1, 3, 4 & 5 (External Evaluation)	60
2	Evaluation 2 Oral Communication	Extempore & Miming – Unit 2 (External Evaluation by English, MBA Dept.)	20
3	Evaluation 3 Technical Paper Presentation	Internal Evaluation by the Dept.	20
		Total	**100**

Reference Books

1. Aggarwal, R.S. "A Modern Approach to Verbal and Non-verbal Reasoning", Revised Edition 2008, Reprint 2009, S.Chand & Co Ltd., New Delhi.
2. Abhijit Guha, "Quantitative Aptitude", TMH, 3rd edition
3. Objective Instant Arithmetic by M.B. Lal & Goswami, Upkar Publications.
4. Word Power Made Easy by Norman Lewis W.R. GOYAL Publications

Note :

- Instructor can cover the syllabus by Class room activities and Assignments (5 Assignments/week)
- Instructor Manual has Class work questions, Assignment questions and Rough work pages
- Each Assignment has 20 questions from Unit 1, 3, 4 and Unit 5 and 5 questions from Unit 2.
- Evaluation has to be conducted as like Lab Examination.

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COURSE CODE & COURSE NAME	CO	PO												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
50TP0P2– Career Competency Development II	CO1	1	2	1	1	1	1	1	1	1	3	2	3	1	1	2
	CO2		1		1	1	1	1	1	2	3	2	3	1	1	2
	CO3	1	1	1	1	2	3	1	1	2	3	2	3	2	2	2
	CO4	3	2	2	2	1	2	1	1	2	3	2	3	2	3	1
	CO5	3	2	2	2	1	2	1	1	2	3	2	3	2	3	1

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V SEMESTER

K.S.Rangasamy College of Technology–Autonomous								R2018
50 MA 015 – Operations Research								
B.Tech -Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
V	3	1	0	60	4	50	50	100
Objective(s)	• To familiarize with the basic concepts and models of the operations research • To analyze the real world problems using operations research techniques • To impart knowledge about optimization techniques and take effective managerial decisions • To develop mathematical skills to solve the linear programming models arising from a wide range of applications • To emphasize the optimization techniques for the effective utilization of available resources in engineering field							
Course Outcomes	1. Form the Linear programming model and solve by simplex algorithms 2. Apply the transportation and assignment models and predict the optimum solution 3. Apply CPM and PERT techniques to control project activities 4. i) Predict the optimal replacement policy for machineries ii) Determine an optimal order in which n jobs can be processed 5. i) Explain the Game theory, zero sum game and dominance property ii) Describe the Simulation model and Monte- Carlo Technique							

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the numbers hours indicated.

Linear Programming Problems

Formulation of LP problem - Solution of LP problem by graphical method - Simplex method - Big-M method – Duality [9]

Transportation and Assignment Problems

Transportation problems: North-west corner rule - Least cost method - Vogel's approximation method - MODI method - Assignment problems: balanced and unbalanced assignment problems - Travelling salesman problems [9]

Network Analysis

Network construction - Computation of earliest start time, latest start time, total, free and independent float time – PERT- computation of optimistic, most likely, pessimistic and expected time [9]

Sequencing and Replacement Models

Processing n jobs on 2 machines - processing n jobs on 3 machines - processing n jobs on m machines. Replacement models - Individual replacement - Group replacement [9]

Game Theory and Simulation Model

Game theory: Saddle point determination - Dominance property - graphical method - Simulation model - Monte - Carlo Technique. [9]

Lecture Hours: 45 Tutorial hours: 15 Total Hours: 60

Text book(s):

1. KantiSwarup, P.K. Gupta, Man Mohan, "Operations Research", Sultan Chand & Sons,15th Edition, New Delhi, 2010
2. V.Sundaresan, K.S.Ganapathy Subramanian, K.Ganesan., "Resource Management Techniques" AR Publications, 8th Edition, Chennai, 2014

Reference(s):

1. Taha, H.A. "Operations Research: An Introduction", Pearson Education Edition, Asia, 10th Edition, New Delhi, 2016
2. Sharma J. K., "Operations Research: Theory and Applications", Trinity Press, 6th Edition, New Delhi, 2017
3. Gupta P. K. and Hira D.S., "Problems in Operations Research", S. Chand and Company, 3rd Edition, New Delhi, 2013
4. Dr.G. Srinivasan, "Introduction to Operations Research", NPTEL online video courses

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50 MA 015 – Operations Research															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3	2	3	2		2		3	2	3	2	2
CO2	3	3	3	3	2	3	2		2		3	2	3	2	2
CO3	3	3	3	3	2	3	2		3		3	2	3	2	2
CO4	3	3	3	3	2	3	2		3		3	2	3	2	2
CO5	3	3	3	3	2	3	2		3		3	2	3	2	2

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K.S. Rangasamy College of Technology-Autonomous								R 2018
51 TT 501 – Knitting Technology								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
V	3	0	0	45	3	50	50	100

Objective(s)	• To explain the mechanism of weft knitting of various knitted structures. • To demonstrate the mechanism of warp knitting of various knitted structures. • To impart the knowledge on basic knitted structures of various knitted fabrics. • To explain the modern development in mechanism of various knitted fabric production. • To impart the knowledge on recent trends in knitted garment production.
Course Outcomes	**At the end of the course, the students will be able to** 1. Demonstrate the construction and function of various knitting elements, machines, choose yarns for knitting and mechanism of knitting of plain, rib, interlock, and purl structures. 2. Draw the structures of plain, rib, interlock, purl, relate characteristics, end uses of fabrics with their structures, mechanism of needle selection and formation of knit, tuck, float stitches and draw the structure of derivatives. 3. Calculate optimum knitting conditions and production; explain dimensional state of knitted fabrics and the mechanism of knitting of various structures using flat knitting machine and socks knitting. 4. Explain construction and function of various warp knitting elements and the mechanism of knitting using Tricot and Rachel knitting machines. 5. Draw the warp knitted structures and explain their characteristics and the influence of various factors on quality of knitted fabric.

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the numbers hours indicated.

Weft Knitting

Characteristics of woven and knitted fabrics; classification of weft knitting machines; comparison of warp and weft knitting; yarn quality requirements for knitting; weft knitting elements; single jersey, rib, interlock and purl knitting machines – construction and knitting operation. Needle selection in weft knitting - multi-cam tracks, pattern wheels, pattern drums, programmed and punched tapes. Knitting of technical textiles. production calculations in weft knitting [9]

Weft and warp Knitted Structures

Single jersey, rib, purl and interlock structures – characteristics and their derivatives – lecoste, accordian type, Swiss and derby ribs, half and full cardigan, eight lock, single pique; fundamentals of formation of knit, tuck and float stitches; warp knit structures - chain stitch, tricot, lock knit structures, satin, blind lap and inlay. [9]

Flat Knitting

Basic principles and elements of flat knitting machines; different types of flat knitting machines- manual, mechanical and computer controlled; production of various weft knitted structures using flat knitting machines; mechanism of socks knitting. [9]

Warp Knitting

Classification of warp knitting machines; preparation of yarns for warp knitting; knitting elements and working of Raschel and Tricot knitting machines, production of elementary warp knitted structures -lapping diagrams and notations. Open lap, closed lap, overlap, underlap, swinging, shogging. [9]

Recent development in knitted garments and Quality Control

Seamless garments, Fascinated garments; Process control in knitting; defects in knitted fabrics- causes and remedies; dimensional stability, spirality; production calculations in weft knitting. [9]

Total Hours: 45

Text book(s):

1. Ajgaonkar. D.B., “Knitting Technology”, Universal Publication Corporation, Mumbai, 1998.
2. Spencer. D.J., “Knitting Technology”, Textile Institute, Manchester, 1989.

Reference(s) :

1. N. Anbumani., “Knitting fundamentals, machines, structures and developments”, New Age International (P) Ltd.,Publisher, 2007.
2. Samuel Raz., “Flat Knitting; The new generation”, Meisenbach GmbH, Bamberg, 1992.
3. Samuel Raz., “Warp Knitting Production”, Melliand Textilberichte GmbH, Rohrbacher, 1987.
4. P. K. Banerjee, “Knitting Technology”, NPTEL web course.

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51 TT 501 – Knitting Technology															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2									3		3	2	
CO2	3	3	2								2	2	3	2	
CO3	3	3									2	2	3	2	
CO4	3	2		2							2		3	2	
CO5	3	2	2	2							2		3	2	

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K.S. Rangasamy College of Technology-Autonomous								R2018
51 TT 502 - Textile Chemical Processing II								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
V	3	0	0	45	3	50	50	100

Objective (s)	• To impart knowledge on methods and styles of printing. • To impart knowledge on various printing process. • To impart knowledge on various methods of finishing. • To impart knowledge on various functional finishing process. • To impart knowledge on effluent treatment.
ourse Outcomes	**At the end of the course, the students will be able to** 1. Explain the ingredients, methods of printing and styles of printing. Printing defects and limitations 2. Describe the printing procedure of cotton, polyester, silk, wool and garment. Discuss its faults- cause &remedies 3. Explain the procedure involved in finishing of cotton materials using various machines and procedure involved in finishing of denims. 4. Describe the procedure involved in crease resistance, water proof, water repellent, flame proof and value added finishing. 5. Summarize the various treatments of textile effluents, waste disposal & solid waste reduction techniques and concepts of ISO14000.

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Methods and Styles of Printing

Essential ingredients and properties of printing paste; methods of printing- roller, screen (manual and flatbed) and rotary printing method; styles of printing-direct, discharge and resist. Modern Printing Techniques -transfer printing, foam printing; ink jet printing, UV printing and 3D printing. [9]

Printing of Fabrics

Printing of cotton fabric using direct, reactive, Natural dyes and pigment; printing of polyester with disperse dyes; printing of silk and wool with acid and basic dyes; digital printing; garment printing; printing faults- causes and remedies. [9]

Finishing

Introduction to finishing- objectives- mechanical and chemical finishing; durable and temporary finishes on cotton fabrics; back filling; raising and brushing; calendaring; anti shrink finish; relaxation shrinkage, felt compacting; softening, felting, non-felting; Denim finishing- stone, enzyme wash; bio-polishing. [9]

Functional Finishes

Crease resist finish; cross linking agents – DMDHEU, poly carboxylic acids (BTCA & citric acid) for cotton; water proof and repellent finishes for cotton and synthetics; flame resistance finishes for cellulosic's and blends; antimicrobial finishes; softeners; finishing of knits; value added finishing of garments; herbal finishes and nano finish. [9]

Effluent Treatment

Textile effluent–textile waste water problems, textile waste water characteristics, chemicals used in textile industry; treatment of textile effluents – primary, secondary and tertiary techniques for effluent treatment; solid waste reduction and disposal; concepts of ISO 14000. [9]

Total Hours: 45

Text book(s):

1.	Marie Christine Noel and Michael Cailloux, " Printed Textile Design" Paperback publisher, 2015
2.	K.L.Mittal and Thomas Bhaners,"Textile Finishing: Recent development and Future Trends" ISBN 9781119426769, 2017.

Reference(s) :

1.	Peter J. Hauser, "Advances in Treating Textile Effluent", InTech, October 2011
2.	Padmavankar, "Textile Effluent NCUTE", IIT, Publication, 2002.
3.	W.D.Schindler, "Chemical Finishing of Textiles", Wood Head Publishing Ltd, 2004.
4.	Prof. Dr. rer. nat. Hans-Karl Rouette, "Encyclopedia of Textile Finishing", Springer Verlag, 2002.

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51 TT 502 - Textile Chemical Processing II															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3				2					2			3	2	
CO2	3	3	2	3						2			3	3	
CO3	3		2							2			3	2	
CO4	3		2							2			3	2	
CO5	3	3	3			2	2			2		2	3	2	2

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Rev. No. 3 / w.e.f. 18/01/2023, Passed in BoS Meeting held on 22/12/2022,
Approved in Academic Council Meeting held on 07/01/2023.

K.S. Rangasamy College of Technology-Autonomous								R2018
50 TT 503 - Woven Fabric Structure								
B. Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
V	3	0	0	45	3	50	50	100

Objective(s)	• To teach the basic of woven fabric design and its influence on fabric properties • To teach the different weaves and methods of production • To impart knowledge on colour theory and application to woven fabrics • To understand the different concept in pile and multi layer fabrics • To impart knowledge on advanced fabric structures
Course Outcomes	**At the end of the course, the students will be able to** 1. Describe about the elements of fabric structure and elementary weaves. 2. Explain the loom requirements for special weave and colour theory also analyze the concept of colour and weave effects. 3. Explain the loom requirements and uses of extra thread figuring also analyze the backed fabrics and concept of bed ford cords. 4. Analyze the designing concept of pile fabrics, multilayer fabrics and double cloths. 5. Analyze the advanced weave structures and their loom requirements.

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Elements of Simple Structure

Elements of fabric structure and the devices used for analyzing the fabrics; elementary weaves – plain weave and its derivatives, twill weave and its derivatives, twill and twist interaction, twill angle; satin, sateen weaves and their derivatives; methods of representation on point paper; different types of drafts; loom requirements for producing primary weaves. [9]

Special Weaves and Colour Theory

Design, characteristics, loom requirements and uses of special weaves – ordinary honey comb, brighton honey comb, huck –a – back and its modifications, mock leno, crepe weaves; colour theory – light and pigment theory, modification of colours, application of colours, colour and weave effects. [9]

Compound Structure

Design, characteristics, loom requirements and uses of extra warp, extra weft figuring and backed fabrics; extra warp and extra weft figuring with single and two colours; backed fabrics, bed ford cords, plain faced, twill faced and wadded bed ford cords; welts, piques and wadded piques. [9]

Pile Fabrics and Multi Layer Fabrics

Design, characteristics, loom requirements and uses of pile fabrics and multilayer fabrics –Warp pile: wire pile, fast wire pile, terry weaves, terry stripe and terry check. Weft Pile: plain back, twill back velveteen; Double cloths-classification, types of stitches, wadded double cloth, warp and weft wadded double cloth, centre stitched warp and weft way double cloth; multi layer fabrics. [9]

Advanced Structures

Design, characteristics, loom requirements and uses of advanced structures – damask, brocades, tapestry, gauze and leno weaves, types of sheds, doup wire, easer bar motion and jumper motion; Russian cords – net leno. [9]

Total Hours: 45

Text book(s):

1. Grosicki Z.J, “Textile Design and Colour” – Textile Institute, Universal book publisher, Mumbai 2004.
2. Grosicki Z.J, “Advanced Textile Design” - Textile Institute, Universal book publisher ltd, Mumbai 2007.

Reference(s) :

1. Goerner D, “Woven Structure and Design”, Part-I - WIRA, 1986.
2. Goerner D, “Woven Structure and Design”, Part-II – BTT6, 1989.
3. Marks and A.T.C. Robinson, “Woven cloth construction”, Textile Institute, Manchester, 1969.
4. N.Gokarneshan, “Fabric Structure and Design”, New Age International Publishers, 1st Edition, New Delhi, 2004.

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50 TT 503 - Woven Fabric Structure															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2										3	2	
CO2	3	2											3	2	
CO3	3	3											2	1	
CO4	3	3	2										2	1	
CO5	3	3	2										3	2	

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50 TT 5P1 - Textile Chemical Processing Laboratory								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
V	0	0	4	60	2	60	40	100

Objective(s)	• To acquire practical knowledge on pretreatment. • To acquire practical knowledge on dyeing of various fabrics. • To acquire practical knowledge on printing. • To acquire practical knowledge on finishing. • To acquire practical knowledge on testing.
Course Outcomes	**At the end of the course, the students will be able to** 1. Practice the pretreatments desizing, scouring and bleaching. 2. Perform the dyeing process on cotton, wool and silk. 3. Apply disperse dyeing process, direct style of printing and pigment printing. 4. Practice discharge style, resist style and Tie & Dye style of printing 5. Determine the various colour fastness, shrinkage and Soft finishing of cotton fabric using cationic softeners.

LIST OF EXPERIMENTS

1. Desizing of grey cotton fabric using enzymes & Scouring of cotton

2. Bleaching of cotton using hypochlorite and hydrogen peroxide

3. Dyeing of cotton using
   a) Reactive dyes
   b) Vat dyes
   c) Natural dyes

4. Dyeing of wool and silk with
   a) Acid dyes
   b) Basic dyes

5. Dyeing of polyester using disperse dyes (HTHP)

6. Direct style of printing on cotton fabric using
   a) Vinyl sulphone reactive dyes
   b) Pigment printing

7. Discharge style and Resist style of printing on cotton fabric – white & colour base

8. Tie & Dye style of printing on cotton fabric

9. Determination of colour fastness to
   a) Washing
   b) Rubbing
   c) Bleaching agents (Chlorine)
   d) Perspiration

10. Determination of cotton fabric shrinkage and Soft finishing of cotton fabric using cationic Softeners

Total Hours: 60

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50 TT 5P1 - Textile Chemical Processing Laboratory														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3			2	2				2		2		3	2	
CO2	3			2	2				2		2		3	2	
CO3	3			2	2				2		2		3	2	
CO4	3			2	2				2		2		3	2	
CO5	3	3	3	2	2				2		2		3	2	

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K.S.Rangasamy College of Technology–Autonomous								R2018
50 TT 5P2 - Fabric Structure Laboratory								
B. Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
V	0	0	4	60	2	60	40	100

Objective(s)	• To teach the structure of different weaves. • To impart knowledge on how different types of fabric parameters can be used for designing fabrics given an application. • To provide fundamentals of colour theory in order to apply in fabric design and construction. • To impart exposure on the analysis different fabric structures with its construction details. • To impart exposure about colour theory relevant to production of fabrics with various colour combinations and designs.
Course Outcomes	**At the end of the course, the students will be able to** 1. Gain knowledge about the elements of fabric structure and elementary weaves. 2. Explain the loom requirements for special weave and colour theory. 3. Explain the loom requirements and uses of extra thread figuring. 4. Analyze the backed fabrics and gain knowledge on concept of mock leno and bed ford cords. 5. Explain the loom requirements and uses of advanced weave structures.

LIST OF EXPERIMENTS

Analysis of fabric structure of the following weaves:

1. Different types of plain weave fabrics (Casement, poplin, cambric, long cloth, & mull cloth).
2. Twill, herring bone and pointed twill weaves
3. Satin and Sateen weaves
4. Honey comb weave, Huck-a-back weave & Mock Leno
5. Extra thread figuring – extra warp and weft figuring
6. Backed and Velvet fabrics
7. Double cloth
8. Gauze and Leno
9. Terry fabrics and Bedford cords
10. Single jersey, rib, interlock and purl structures and derivatives of jersey structures.

Total Hours: 60

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50 TT 5P2 - Fabric Structure Laboratory															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2			2							2	3	2	
CO2	2	2											3	2	
CO3	3	2										2	2	1	
CO4	3	2										2	2	1	
CO5	3	3	2									2	3	2	

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K.S.Rangasamy College of Technology - Autonomous Regulation								R 2018
Semester V								
Course Code	**Course Name**	**Hours/Week**			**Credit**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CA**	**ES**	**Total**
50 TP 0P3	**Career Competency Development III**	**0**	**0**	**2**	**0**	**100**	**00**	**100**
Objective(s)	• To help the learners to enrich the written and oral communication skills in the academic and professional contexts • To help the learners to enrich their verbal and logical reasoning ability to meet out the employability requirements of the companies • To help the learners to comprehend the Intermediate level of aptitude skills required to attend placement and competitive online exams • To help the learners to enhance their knowledge in the quantitative aptitude skills in algebraic and linear equations. • To help the learners to augment the core technical and coding skills of their respective domains to compete in coding contests							
Course Outcomes	**At the end of the course, the student will be able to** 1. Examine the written and oral communication skills in the academic and professional contexts 2. Interpret the concepts of verbal reasoning and relate for the concepts to the requirements of the competitive exams and employability 3. Infer the concepts of intermediate level of aptitude skills pertaining to competitive exams and company recruitments. 4. Assess their comprehension in the quantitative aptitude skills in algebraic and linear equations. 5. Review the core technical and coding skills of their respective domains to compete in coding contests							

Unit – 1	Written and Oral Communication – Part 1	Hrs
Reading Comprehension Level 3 - Self Introduction - News Paper Review - Self Marketing - Debate- Structured and Unstructured GDs Psychometric Assessment – Types & Strategies to answer the questions **Practices:** Sentence Completion - Sentence Correction - Jumbled Sentences - Synonyms & Antonyms - Using the Same Word as Different Parts of Speech - Interpretation of Pictorial Representations-Editing-GD-Debate. **Materials:** Instructor Manual, Word power Made Easy Book, News Papers		6
Unit – 2	Verbal & Logical Reasoning – Part 1	8
Syllogism - Assertion and Reasons - Statements and Assumptions - Identifying Valid Inferences - identifying Strong Arguments and Weak Arguments - Statements and Conclusions - Cause and Effect - Deriving Conclusions from Passages - Seating Arrangements **Practices:** Analogies - Blood Relations - Statement & Conclusions **Materials:** Instructor Manual, Verbal Reasoning by R.S.Aggarwal		
Unit – 3	Quantitative Aptitude – Part 3	6
Probability - Calendar- Clocks - Logarithms - Permutations and Combinations **Materials:** Instructor Manual, Aptitude Book		
Unit – 4	Quantitative Aptitude – Part 4	6
Algebra - Linear Equations - Quadratic Equations - Polynomials **Practices:** Problem on Numbers - Ages - Train - Time and Work - Sudoku - Puzzles **Materials:** Instructor Manual, Aptitude Book		
Unit – 5	Technical & Programming Skills – Part 1	4
Core Subject – 1,2 3 **Practices :** Questions from Gate Material **Materials:** Text Book, Gate Material		
	Total	30

Evaluation Criteria

S.No.	Particular	Test Portion	Marks
1	Evaluation1 WrittenTest	15 Questions each from Unit 1, 2, 3, 4 & 5 (External Evaluation)	50

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2	Evaluation 2 - Oral Communication	GD and Debate (External Evaluation by English, MBA Dept& External Trainers)	30
3	Evaluation 3 – Technical Paper Presentation	Internal Evaluation by the Dept.	20
		Total	**100**

Reference Books

1. Aggarwal,R.S."A Modern Approach to Verbal and Non-Verbal Reasoning", Revised Edition 2008, Reprint2009, S.Chand& Co Ltd., NewDelhi.
2. AbhijitGuha, "Quantitative Aptitude", TMH,3rd edition
3. Objective Instant Arithmetic by M.B. Lal & GoswamiUpkar Publications.
4. Word Power Made Easy by Norman Lewis W.R. GOYAL Publications

Note :

1. Instructor can cover the syllabus by Class room activities and Assignments(5Assignments/week)
2. Instructor Manual has Class work questions, Assignment questions and Rough workpages
3. Each Assignment has 20 Questions from Unit 1,2,3,4 and 5 and 5 Questions fromUnit1
4. Evaluation has to be conducted as like Lab Examination.

COURSE CODE & COURSE NAME	CO	PO												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
50TP0P3– Career Competency Development III	CO1	1	1	1	1	1	1	1	1	2	3	2	3	1	1	2
	CO2	2	1	2	2	1	2	1	1	2	3	3	3	1	1	1
	CO3	2	1	2	2	1	1	1	1	2	3	2	3	1	2	1
	CO4	2	1	2	2	1	1	1	1	2	3	2	3	1	2	1
	CO5	2	2	2	2	2	2	2	2	2	3	2	3	3	2	1

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VI SEMESTER

K.S. Rangasamy College of Technology - Autonomous								R 2018
51 TT 601 - Textile and Apparel Quality Evaluation								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VI	3	0	0	45	3	50	50	100
Objective(s)	• To study the importance of quality evaluation. • To know in detail the various aspects of testing fibre properties. • To know in detail the various aspects of testing yarn properties. • To know in detail the various aspects of testing fabric properties. • To know in detail the various aspects of assessing garment properties.							
Course Outcomes	**At the end of the course, the students will be able to** 1. Explain the fibre, yarn and fabric sampling methods. 2. Describe the working of fibre testing equipment. 3. Describe yarn fundamental properties and handle yarn testing equipment. 4. Describe the fabric basic properties and handle fabric testing equipment. 5. Implement the concept of garment checking procedure and assess the properties for apparel							

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Introduction

Definition of quality; types of quality – quality of design, quality of conformance, quality of performance, quality control and quality assurance; factors influencing quality; reasons for textile quality evaluation; types of sampling - random and biased sampling, fibre sampling from bulk, combed slivers and rovings; yarn sampling; fabric sampling; standard testing atmosphere; testing methods. [9]

Fibre Quality Evaluation

Determination of fibre length and its uniformity- Baer sorter, digital fibrograph; determination of fibre fineness determination of fibre strength and elongation - stelometer; high speed fibre measurement- High Volume Instrument, Advanced Fibre Information System; evaluation of man-made fibre properties - single fibre fineness - vibroscope method; determination of trash and fibre maturity; determination of moisture content and regain in fibres. [9]

Yarn Quality Evaluation

Linear density – Direct & Indirect systems and its determination; evaluation of twist in single and ply yarns; crimp; determination of evenness- capacitance method, spectrogram, variance-length curve; yarn hairiness, principles of tensile testing, tensile testing of yarn at higher speeds, factors influencing tensile characteristics; classification of yarn faults - Classimat; yarn appearance assessment – ASTM yarn grades. [9]

Fabric Quality Evaluation

Determination of tensile and tear strength; bursting strength; dimensional stability; air permeability; water vapour permeability; water repellency; thermal conductivity; abrasion resistance; snagging; pilling; crease recovery; drape; stiffness; fabric weight, thickness; colour fastness Flammability. [9]

Fabric Assessment requirement for Apparel

Comfort- subjective and objective evaluation of fabric handle - KES, FAST, FTT; Fabric checking procedure - 4 point system, 10 point system; fabric inspection machine. Seam slippage and strength testing; button pull strength test, button impact test, zipper strength test. Testing for harmful substances in textile and apparel. [9]

Total Hours: 45

Text book(s):

1.	A. Basu, “Textile Testing; Fibre, Yarn and Fabric”, SITRA, Coimbatore, 2001.
2.	B. P. Saville, “Physical Testing of Textiles”, Wood head Publishing Ltd., England, 1999.

Reference(s) :

1.	J.E. Booth, “Textile Testing”, Butterworth Heinemann Ltd., U.K, 1996.
2.	V. K. Kothari (Ed.), “Testing and Quality Management”, Vol.1, IAFL Publications, New Delhi, 1999.
3.	V.Sundaram, “Hand book of Textile Testing”, CTRL Publications, Bombay, 2004.
4.	Pradip V. Mehta., "Managing Quality in the Apparel Industry", NIFT Publication, India, 1998.

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51 TT 601 - Textile and Apparel Quality Evaluation															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	2	2			1		2			2	2	
CO2	3	3	2	3	2			1	2	2		2	2	2	
CO3	3	3	2	3	2			1	2	2		2	2	2	
CO4	3	3	2	3	2			1	2	2		2	2	2	
CO5	3	3	2	3	2			1	2	2		2	2	2	

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K.S. Rangasamy College of Technology-Autonomous R 2018								
51 TT 602 - Garment Manufacturing Technology I								
B. Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VI	3	0	0	45	3	50	50	100

Objective(s)	• To impart knowledge on fabric spreading and cutting • To impart knowledge on stitches, seams and sewing machine • To impart knowledge on human anatomy and body measurements • To impart knowledge on basic pattern making • To impart knowledge on pattern grading and marker planning
Course Outcomes	**At the end of the course, the students will be able to** 1. Understand the fabric spreading process and various types of cutting machines 2. Sketch various head theories and difference between normal figure and fashion figure 3. Classify the different stitches, seams, sewing threads and Basics of SNLS 4. Demonstrate the skills acquired on basic patterns for mens, womens and childrens 5. Demonstrate the skills acquired on grading patterns for different garments and marker planning and marker making.

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours Required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Fabric Spreading and Cutting

Methods of fabric spreading, spreading equipment's, computerized spreaders. Types of cutting machines, straight knife, round knife and band knife cutting machines; notchers, drills, computerized cutting machines. [9]

Stitches, Seams and Basic Sewing Machine

Classification of stitches and seams; stitch and seam properties; sewing threads – functions of sewing thread, characteristics of threads, thread size and ticket number; classification of sewing machines; basic parts and working of SNLS sewing machine, over lock and flat lock sewing machines. [9]

Anatomy and body measurements

Anatomy - Importance of anatomy in garment making; proportion - eight head theory and ten head theory; normal figure and fashion figure - its differences; body measurements - measurements needed for the construction of children's, men's and ladies garments; method and sequence of taking measurements; recording of measurements; meaning of the men's, women's size charts and control dimensions. [9]

Basic Pattern Making

Basic pattern making – Importance of paper pattern; pattern making tools; Methods of pattern making –Draft pattern technique, flat paper pattern making technique and draping; Drafting of basic pattern – bodice front, back, sleeve, skirt front and back. Drafting of men's shirt components like front, back, yoke and sleeves; pattern grain line and its importance; pattern making for leg garments – front and back for trouser, skirt front and back. [9]

Pattern Grading and Marker Planning

Pattern grading – definition and general rules; grading patterns for shirt, trousers, skirt and midi top; basics of computerized pattern making; Advantages of grading technology; Marker planning and marker making. [9]

Total Hours: 45

Text book(s):

1.	Helen Joseph Armstrong, "Pattern Making for Fashion Design", Harper Collins N.Y., 1995, IIndedition.
2.	Sumathi G.J. "Elements of Fashion and Apparel Design" New Age International Publishers, New Delhi 2002.

Reference(s) :

1.	Gini Stephens Frings, "Fashion-from concept to consumer" 7th Edition, Prentice Hall 2005.
2.	Ruth.E. Glock / Grace I.Kunz, "Apparel manufacturing and sewn product analysis" fourth edition Prentice hall, 2005
3.	Sharon Lee Tate, "Inside Fashion Design", 5thEdition, Pearson Prentice Hall, Delhi 2004.
4.	Geerycooklin" Pattern grading for women's clothes the technology of sizing" OM Books Services, New Delhi, 2000.

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51 TT 602 - Garment Manufacturing Technology I															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2		2	3	2	1	3	2	1	1	3		1
CO2	3	3	2		1	3	3		3	1	1	1	3		1
CO3	3	1	3	2	2	3	3	1	3	1		1	2	2	1
CO4	3		3	3	1	3	3		2	1		1	2	2	2
CO5	3		3	3		3	3		2	1		1	2	1	1

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K.S.Rangasamy College of Technology–Autonomous								R2018
50TT603 - Nonwoven Technology								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VI	3	0	0	45	3	50	50	100

Objective(s)	• To realize the basics of nonwoven fabrics • To know various methods of manufacturing nonwoven fabrics • To acquire knowledge on their applications in various fields • To test the performance of nonwovens fabrics • To gain knowledge on finishing of nonwovens materials
Course Outcomes	**At the end of the course, the student will be able to** 1. Classify the nonwoven fabric and fibres and other materials used in manufacturing 2. Demonstrate the web forming techniques in non-woven. 3. Analyze and compare the properties of fabrics produced from various bonding methods 4. Explain the finishing methods and end uses of non-woven fabrics 5. Evaluate the performance of non-woven fabrics by various testing methods

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Introduction

Definitions and classification of nonwoven fabrics; fibres used for making nonwovens and their characteristics ;polymer powders, pigments, stabilizers, binder fluids, binder fibres-adhesive fibres (soluble and hot melt) and their characteristics; worldwide production and consumption of nonwoven fabrics. [9]

Web Forming

Web preparation-methods of making the web using carding machines-parallel laying and cross laying, factors influencing the web quality; various air laid principles and factors influencing web quality; wet laid principles–methods of binder addition and methods of drying nonwoven batt, factors influencing web quality; synthetic web formation principles-spun bonded and melt blown method; Non-woven layering-MSM and SMS, applications; structure-property relationship in nonwoven fabrics. [9]

Bonding

Mechanical bonding techniques-working principle of needle punching machine, surface structuring, needle characteristics, needle parts and influence of needling conditions on nonwoven batt; stitch bonding-working principle(with and without thread); hydro entangling (spun laced)-working principle and process influence on nonwoven batt; thermal bonding-principles of calendaring, ultrasound, contact drying, radiation drying; chemical bonding-principles of adhesion, cohesion bonding and methods of adhesive bonding(doctor blade, engraved cylinder, spraying and foam application). [9]

Finishing and End Uses

Finishing-dry finishing-shrinkage, wrenching and creping, calendaring, perforating, slitting and splitting; wet finishing–printing, softening, flameproof coating, laminating and flocking; introduction to nonwoven composites; end uses of nonwoven fabrics in technical textiles and home textiles and lining fabrics. [9]

Testing

CBR cone puncture test, liquid strike through time, bacterial filtration test(wet & dry), porosity test, free formaldehyde, abrasion test, demand absorbency, opacity, super absorbency test-centrifuge retention capacity, geo textiles-resistance to weathering, microbiological resistance by soil burial test, home textiles-flammability, bending rigidity, resistance to static electricity of floor fabrics. [9]

Total Hours: 45

Text book(s):

1.	S.J. Russell (Ed.), “Handbook of Nonwovens”, Wood head Publishing, CRC Press, Washington DC, 2007
2.	Albrecht Wilhelm, “Non-woven fabrics: Raw material, Manufacture, Applications”. Wiley VCH, 2008. https://www.inda.org/about-nonwovens/nonwovens-glossary-of-terms/

Reference(s) :

1.	Purdy.A.T., “Developments in Non-woven fabrics”, Textile progress, vol.12, No.47, Textile Institute 1983
2.	M.S. Casper, “Nonwoven Textiles”, Noyes Data Corp. (Park Ridge, N.J), 1975
3.	M. Mcdonald, “Nonwoven Fabric Technology”, Park Ridge, NJ: Noyes Data, 1971
4.	Wilhelm Albrecht, “Nonwoven Fabrics: Raw Materials, Manufacture, Applications, Characteristics, Testing Processes”, Wiley-VCH; 1st edition (10 December 2002)

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50TT603 - Nonwoven Technology															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2		2		1					1	2		2	2	
CO2	2		2							1		1	2	1	1
CO3	2		2		1					1	2		2	2	
CO4	2		2							1			2		
CO5	2		2							1			2		

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K.S.Rangasamy College of Technology-Autonomous								R 2018
51 TT 604 - Technical Textiles								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VI	3	0	0	45	3	50	50	100
Objective(s)	• To impart the knowledge on various technological aspects of technical textiles. • To provide an overview on the medical textile requirements and applications. • To figure out the applications and properties for Geo and Agro Textiles • To taught the smart garments technology • To inculcated the various industrial and sports textile applications							
Course Outcomes	**At the end of the course, the students will be able to** 1. Explain the scope, classification & application of technical textiles & also to Outline the material requirement used in technical textiles 2. Conclude the role of textile materials in the medical textiles product development. 3. DescribethepropertiesrequiredtouseinAgrotextiles&Geotextilesandtheapplicationof Geo & Agro textiles. 4. Summarize the selection requirements, functions & applications of protective & smart textiles. 5. Outline the Industrial applications and sports textile products.							

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Introduction, Fibres& Structures

Technical Textiles: Introduction - Definition, Scope of technical textiles, Classification & Application of Technical textiles. Fibres– Conventional Fibres, High Strength & High Modulus Fibres, High Performance fibres, Ultra-fine and Novelty fibres in Technical textiles. Engineering Textile Structures for Technical Textiles. [9]

Medical Textiles

Medical Textiles: Introduction, Materials used & its requirements. Classification of Medical textiles - Textiles for implantations, Non-implantations textiles, Extra-corporeal devices, Healthcare & Hygiene Products. [9]

Geo & Agro Textiles

Geo Textiles: Geo textile, Geo synthetics, Fibres and its selection for Geo textiles, Functions of Geo textiles, Engineering properties of Geo textiles, Geo textile structure, Applications for natural Geo textiles. Agro Textiles - Textiles in Agriculture - Fibres details & Properties, Applications of Agro textiles [9]

Protective & Smart Textiles

Protective Textiles: Introduction, Selection of protective clothing materials, fibres and fabrics for Protective Textiles, Textiles for environmental protection; Thermal insulation materials; Biological and chemical warfare protection, Nuclear protective fabrics. Smart Textiles - Role of smart materials in textiles, Shape Memory Fibres, Shape Memory Material, Concepts associated with shape memory materials, SMM in smart fabrics and garments. [9]

Miscellaneous Industrial applications of textiles

Textiles in Electronics, Textiles for Banners and Flags. Transport Bags and Sheets, Canvas Covers and Tarpaulins, Ropes and Nets, Home and Office Furnishings, Textiles in sportswear - Fabrics for sportswear and recent developments in sportswear. [9]

Total Hours: 45

Text book(s):

1.	A.R.Horrocks& S.C. Anand (Edrs.), “Handbook of Technical Textiles”, The Textile Institute, Manchester, U.K., WoodheadPublishing Ltd., Cambridge, England, 2000.
2.	E.Willusz, “Military Textiles”, Woodhead Publishing Ltd, 2008.
3.	Richard. A.Scott, “Textiles for Protection”, CRC press, Woodhead Publication, USA, 2005.

Reference(s):

1.	N.W.M. John, “Geotextiles”, Blackie, London, ISBN: 0-216-91995-9, 1987.
2.	S. Adanur “Wellington Sears Handbook of Industrial Textiles”, Technomic Publishing Co. Inc., Lancaster, Pennylvania,ISBN: 1-56676-340-1, 1995.
3.	S. Anand, “Medical Textiles”, Text. Inst., 1996, ISBN: 185573317X.
4.	T.Matsuo, “Fiber materials for Advanced Technical Textiles”, CRC publication, 2008.

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51 TT 604 - Technical Textiles															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	3	1	3							1	2	1	
CO2	3	2	3	1	3		1		1	1		2	2	1	
CO3	2	2	2		3							2	2	1	
CO4	3	2	3	1	3		1		2	2		2	2	1	
CO5	2	2	3		3					1		2	2		

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K.S. Rangasamy College of Technology- Autonomous R 2018								
50 TT 6P1 - Garment Construction Laboratory I								
B. Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VI	0	0	4	60	2	60	40	100
Objective(s)	• To give hands on training in constructing stitches and seams • To give hands on training in darts, tucks and pleats • To give hands on training in sleeves, collars and pockets • To give hands on training in pattern making for children's wear • To give hands on training in constructing basic children's and ladies garments							
Course Outcomes	**At the end of the course, the students will be able to** 1.Construct types of seams and stitches 2.Construct types of pleats, gathers, darts and tucks 3.Demonstrate the pattern drafting and constructions of baby and children wear 4.Demonstrate the pattern drafting and constructions of men's wear 5.Demonstrate the pattern drafting of women's wear							

LIST OF EXPERIMENTS

1. Construction of different types of stitches and seams.
2. Construction of different types of embroidery stitches.
3. Construction of different types of Pleats and gathers.
4. Construction of different types of darts, tucks and yokes.
5. Construction of different types of sleeves, collars and pockets.
6. Drafting pattern and construction of baby's romper.
7. Drafting pattern and construction of children's summer frock.
8. Drafting pattern and construction of men's T-Shirt.
9. Drafting pattern and construction men's pyjama.
10. Drafting pattern for ladies skirt and blouse.

Total Hours:60

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50 TT 6P1 - Garment Construction Laboratory I															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2		1	3	1		2	1	2		2	1	
CO2	3	3	2		2	3	1		3	2	3	2	2	1	1
CO3	3	3	2	2	2	3	1		3	1	3	2	3	2	1
CO4	3	3	2	2	2	3	1	1	3	2	3	2	3	3	1
CO5	3	3	2	1	1	3	1	1	1	1	3	1	3	3	1

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K.S. Rangasamy College of Technology – Autonomous								R 2018
50 TT 6P2 - Textile and Apparel Quality Evaluation Laboratory								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VI	0	0	4	60	2	60	40	100

Objective(s)	• To study the different sampling techniques • To study the evaluation procedure for determining various fibre properties • To study the evaluation procedure for determining various yarn properties • To study the evaluation procedure for determining various fabric properties • To study the evaluation procedure for determining various apparel properties
Course Outcomes	**At the end of the course, the students will be able to** 1. Analyse the fibre length, fibre fineness and bundle fibre strength 2. Evaluate the linear density of sliver, roving and yarn. Determine single yarn and ply yarn twist 3. Evaluate the single yarn strength and lea strength 4. Analyse the fabric abrasion and pilling 5. Evaluate the fabric tensile, bursting strength and tearing strength

LIST OF EXPERIMENTS

1. Determination of fibre length using Baer sorter / fibrograph
2. Determination of fibre fineness using Sheffield micronaire and Determination of bundle fibre strength and elongation using Stelometer
3. Determination of fibre trash content using trash analyzer
4. Determination of linear density of sliver, roving and yarn using wrap block and automatic wrap reel
5. Determination of single yarn and ply yarn twist using manual / electronic twist tester
6. Determination of single yarn strength and elongation using single thread strength tester, Determination of lea strength using mechanical lea tester
7. Determination of fabric GSM and fabric stiffness using stiffness tester
8. Determination of crease recovery angle using crease recovery tester
9. Determination of fabric pilling using ICI pill box tester and Determination of fabric abrasion using Martindale abrasion tester
10. Determination of fabric tensile strength using fabric strength tester, bursting strength using bursting strength tester and tearing strength using Elmendorf tear tester
11. Determination of fabric seam slippage using seam slippage tester
12. Determination of button and snap pull strength using button snap pull tester

Total Hours:60

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50 TT 6P2 - Textile and Apparel Quality Evaluation Laboratory															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	3	2			2	1	2		2		2	2
CO2	3	3	2	3	2			2	1	2		2		2	2
CO3	3	3	2	3	2			2	1	2		2		2	2
CO4	3	3	2	3	2			2	1	2		2		2	2
CO5	3	2	2	3	2			2	1	2		2		2	2

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K.S. Rangasamy College of Technology - Autonomous Regulation								R 2018
Semester VI								
Course Code	**Course Name**	**Hours/Week**			**Credit**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CA**	**ES**	**Total**
50 TP 0P4	**Career Competency Development IV**	**0**	**0**	**2**	**0**	**100**	**00**	**100**

Objective(s)	• To help the learners to enrich the advanced written and oral communication skills in the academic and professional contexts • To help the learners to augment their advanced verbal and logical reasoning ability to meet out the employability requirements of the companies • To help the learners to comprehend the advanced level of aptitude skills in the concepts of Geometry • To help the learners to enhance the data interpretation and analytical skills in varied methods. • To help the learners to enrich the technical and programming skills to be focused on better employability, codeathons and hackathons
Course Outcomes	**At the end of the course, the student will be able to** 1. Examine and correlate the written and oral communication skills in the academic and professional contexts 2. Predict and discriminate advanced verbal and logical reasoning ability to meet out the employability requirements of the companies 3. Infer the concepts of advanced level of aptitude skills on Geometry pertaining to competitive exams and company recruitments. 4. Illustrate the data interpretation and analytical skills in varied methods. 5. Formulate the technical and programming skills to be focused on better employability, codeathons and hackathons

Unit – 1	Written and Oral Communication – Part 2	Hrs
Self-Introduction – GD - Personal Interview Skills **Practices** on Reading Comprehension Level 2 – Paragraph Writing - Newspaper and Book Review Writing - Skimming and Scanning – Interpretation of Pictorial Representations - Sentence Completion- Sentence Correction - Jumbled Sentences - Synonyms & Antonyms - Using the Same Word as Different Parts of Speech - Editing **Materials:** Instructor Manual, Word power Made Easy Book, News Papers		4
Unit – 2	Verbal & Logical Reasoning – Part 2	8
Analogies – Blood Relations – Seating Arrangements – Syllogism - Statements and Conclusions, Cause and Effect–Deriving Conclusions from Passages –Series Completion (Numbers, Alphabets & Figures) – Analytical Reasoning – Classification – Critical Reasoning **Practices**: Analogies – Blood Relations - Statement &Conclusions **Materials:** Instructor Manual, Verbal Reasoning by R.S.Aggarwal		
Unit – 3	Quantitative Aptitude - Part – 5	6
Geometry-StraightLine–Triangles–Quadrilaterals–Circles–Co-ordinateGeometry–Cube–Cone– Sphere. **Materials:** Instructor Manual, Aptitude book		
Unit – 4	Data Interpretation and Analysis	6
Data Interpretation based on Text – Data Interpretation based on Graphs and Tables. Graphs can beColumn Graphs, BarGraphs, LineCharts, PieChart, Graphs representing Area, Venn Diagram & Flow Charts. **Materials:** Instructor Manual, Aptitude Book		
Unit – 5	Technical & Programming Skills – Part 2	6
Core Subject – 4,5,6 **Practices :** Questions from Gate Material **Materials:** Text Book, Gate Material		
	Total	30

Evaluation Criteria			
S.No.	**Particular**	**Test Portion**	**Marks**

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1	Evaluation 1 Written Test	15 Questions each from Unit 1, 2, 3, 4 & 5 (External Evaluation)	50
2	Evaluation 2 - Oral Communication	GD and HR Interview (External Evaluation by English, MBA Dept.)	30
3	Evaluation 3 – Technical Interview	Internal Evaluation by the Dept. – 3 Core Subjects	20
Total			100

Reference Books

1. Aggarwal,R.S."A Modern Approach to Verbal and Non-verbal Reasoning", Revised Edition 2008, Reprint 2009, S.Chand & Co Ltd., New Delhi.
2. Abhijit Guha, "Quantitative Aptitude", TMH,3rd Edition
3. Objective Instant Arithmetic by M.B. Lal & GoswamiUpkar Publications.
4. Word Power Made Easy by Norman Lewis W.R. GOYA LPublications

Note:

- Instructor can cover the syllabus by Class room activities and Assignments(5Assignments/week)
- Instructor Manual has Class work questions, Assignment questions and Rough Work pages
- Each Assignment has 20 questions from Unit 1,2,3,4,5 and 5 questions fromUnit1(Oral Communication) &Unit5(Programs)
- Evaluation has to be conducted as like Lab Examination.

COURSE CODE & COURSE NAME	CO	PO												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
50TP0P4 – Career Competency Development IV	CO1	1	1	1	1	1	2	1	1	2	3	2	3	1	1	2
	CO2	2	1	2	2	1	2	1	1	2	3	3	3	1	1	1
	CO3	2	1	2	2	1	1	1	1	2	3	2	3	2	2	1
	CO4	2	2	2	2	2	1	1	1	2	3	3	3	2	1	1
	CO5	2	2	2	2	2	2	2	2	2	3	2	3	3	2	1

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VII SEMESTER

K.S.Rangasamy College of Technology – Autonomous R2018								
50 HS 003 - Total Quality Management								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	3	0	0	45	3	50	50	100

Objective(s)	• To facilitate the understanding of total quality management principles, tools and techniques. • To equip the students to apply the TQM principles, tools and techniques in manufacturing sectors. • To equip the students to apply the TQM principles, tools and techniques in service sectors. • To impart knowledge on quality management principles, tools, techniques and quality standards for real life applications • To make the students understand the importance of standards in the quality assurance process and their impact on the final product.
Course Outcomes	**At the end of the course, the students will be able to** 1. Recognise the need for quality concepts and its application in organizations. 2. Apply the TQM principles for survival and growth in world class competition 3. Apply the traditional tools and new tools for quality improvement. 4. Apply the tools and techniques like quality circle, QFD, TPM and FMEA for quality improvement. 5. Apply QMS and EMS in organizations.

Note: The hours given against each topic are of indicative. The faculty have the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Introduction

Introduction, definitions of quality, need for quality, evolution of quality, dimensions of quality, product quality and service quality; Basic concepts of TQM, TQM framework, contributions of Deming, Juran and Crosby. Barriers to TQM; Quality statements, customer focus, customer satisfaction, customer complaints, customer retention; costs to quality. [9]

TQM Principles

TQM principles; leadership, strategic quality planning; Quality councils- employee involvement, motivation; Empowerment; Team and Teamwork; Quality circles, recognition and reward, performance appraisal; continuous process improvement; PDSA cycle, Kaizen, 5S & 7S ; Supplier partnership, Partnering, Supplier rating and selection. [9]

TQM Management Tools and Techniques

The seven traditional tools of quality; New management tools - applications to manufacturing, service sector, Statistical Fundamentals, Measures of central Tendency and Dispersion, Population and Sample, Normal Curve, control charts, process capability, concepts of six sigma, Bench marking - Reasons to benchmark, Benchmarking process. [9]

TQM Process based Tools and Techniques

Quality circles, Quality Function Development (QFD), Taguchi quality loss function; TPM- concepts, improvement needs, performance, measures.FMEA- stages, types-Design FMEA and Process FMEA. [9]

Quality Management System

Introduction-Benefits of ISO Registration-ISO 9000 Series of Standards-Sector-Specific Standards - AS 9100, TS16949 and TL 9000 - ISO 9001, ISO 9001:2008 Requirements-Implementation-Documentation-Internal Audits-Registration-Environmental Management System: Introduction—ISO 14000 Series Standards—Concepts of ISO 14001—Requirements of ISO 14001-Benefits of EMS. [9]

Total Hours: 45

Text Book(s):

1.	Dale H. Besterfield .,et. al, “Total Quality Management”, 3rd Edition., Pearson Education South Asia, 2013.
2.	Janakiraman, B and Gopal, R.K, “Total Quality Management – Text and Cases”,Prentice Hall (India) Pvt. Ltd. 2006.

Reference(s)

1.	Joel.E. Ross, “Total Quality Management – Text and Cases”, 3rd Edition, Routledge, 2017.
2.	James R. Evans, James Robert Evans, William M. Lindsay , “The Management and Control of Quality”, 8th Edition, South-Western, 2010.
3.	Kiran.D.R, “Total Quality Management”, Key concepts and case studies, Butterworth – Heinemann Ltd, 2016.
4.	Oakland, J.S. “TQM – Text with Cases”, Butterworth – Heinemann Ltd., Oxford, Third Edition, 2003.

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50 HS 003 – Total Quality Management															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	2	1	3	3	2	3	1	2	1	2	3	1
CO2	3	2	2	1	1	2	1	1	3	2	3	2	2	2	2
CO3	3	1	3	1	1	3	3	1	1	3	2	1	3	3	1
CO4	3	2	3	3	2	2	1	1	2	1	3	2	3	2	2
CO5	2	1	3	1	1	3	2	1	2	1	3	1	1	1	2

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K.S. Rangasamy College of Technology - Autonomous								R 2018
51 TT 701 - Garment Manufacturing Technology II								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	3	0	0	45	3	50	50	100

Objective(s)	• To impart knowledge on apparel business • To impart knowledge on garment production systems • To impart knowledge on sewing tools and attachments • To impart knowledge on garment accessories and pressing. • To impart knowledge on planning and selection of machines.
Course Outcomes	**At the end of the course, the students will be able to** 1. Express the knowledge on basics of apparel business 2. Explain the various types of garment production systems 3. Explain the various types of sewing tools and attachments 4. Explain the various types of garment accessories and pressing 5. Demonstrate the knowledge on software's and selection of machines

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Organization of the Apparel Business

Objectives; Nature of apparel-timing of product change, quality, price; structure of apparel industry –types of contractors, retailing, business concepts, apparel trade association; General information about textile & garment manufacturing industry in India. [9]

Apparel Production Systems

Basic concepts- plant layout- product oriented layout- process oriented layout- progressing bundle system (PBS)- Unit production system (UPS)- Modular production system (MPS) – Flexible manufacturing – work flow – Balancing – Buffer. [9]

Sewing Tools and Attachments

Garment Construction Tools: Folders and attachments, Sewing needles- Needle parts, types, sizes and designation, selection and their application. Timing Diagram of SNLS sewing machine. Sewing machine feed mechanism, Seam and stitch defects- causes and remedial measures. [9]

Garment Accessories and Pressing

Fusing equipment's- working principles, types and its function. Support materials: Interlinings – functions of interlinings; linings – functions of linings; fasteners-purpose of fasteners; functions of zippers, buttons, button holes, snaps, hooks and eyes; function of elastics; types of embroidery; labels - styles and application methods. Pressing and Packing - Methods of pressing equipment and packing methods. [9]

Planning and Selection of Machines

Introduction on CNC controlled Sewing Machine in garment manufacturing. Selection of machines & machinery specifications required for shirts, trousers, knit goods, made-ups, suit, ladies dress material. Analyze the planning, layout and logistics in garment manufacturing. Corporate social responsibility. [9]

Total Hours: 45

Text book(s):

1. Carr.H. Latham. B., "The Technology of Clothing Manufacture", Blackwell Scientific Publications, 2008.
2. Ruth.E. Glock / Grace I.Kunz, "Apparel manufacturing and sewn product analysis" fourth edition Prentice hall, 2005.

Reference(s) :

1. Claire Shaeffer, "Sewing for Apparel Industry", Prentice Hall, 2000.
2. Laing, Webster J "Stitches and Seams" Woodhead Publishing Ltd., 2008.
3. Gerry Cooklin, "Introduction to Clothing Manufacture", Blackwell Science Ltd., 2005
4. Ashdown s.p. " Sizing in clothing", Woodhead Publishing Ltd., 2007.

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51 TT 701 - Garment Manufacturing Technology II															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	1	1		2	1	2	1	1	1	1	1	1	1
CO2	2	3	1			2	1		1	1		1	1	1	1
CO3	2	3	2			1	1		1	1		1	2	1	1
CO4	3	2	1		2	1	1		1	1		1	2	2	1
CO5	3	2	2	1		1		2	1	2	1	1	2	2	2

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K.S.Rangasamy College of Technology - Autonomous								R 2018
50 TT 702 – Financial Management and Costing for Textile and Apparel Industry								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	3	0	0	45	3	50	50	100
Objective(s)	• To understand the basic concepts of financial accounting and Practice the capital budgeting evaluation methods. • To provide an overview on the principles and concepts of working capital and Inventory management. • To familiarize on the fundamental concepts of costing and costing systems followed in apparel industry. • To gain knowledge on yarn and fabric cost calculation. • To offer the students a broad overview on garment costing.							
Course Outcomes	**At the end of the course, the students will be able to** 1. Describe the concepts of Financial Management and carryout invest appraisal and calculate depreciation. 2. Estimate working capital and inventory control techniques required for the textile industry. 3. Summarize the basic concepts in costing and elements of costing and compute the Job order costing and contract costing for apparel industry. 4. Prepare, analyze and interpret the cost sheet for yarn and fabric production. 5. Outline the factors influence the cost of garments and able to determine the cost for garments.							

Note: The hours given against each topic are of indicative. The faculty have the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Introduction and Capital Budgeting [9]

Objectives and functions of financial management. Capital Budgeting- Nature and principle.
Depreciation – method of computing depreciation. Techniques of investment analysis: payback period method, accounting rate of return, Discounted Cash Flow methods - IRR, NPV, PI;

Working Capital and Inventory Management [9]

Capital structure; sources and cost of capital; Working capital; Definition, Principles and Types of working capital – Gross and Net working capital, Operating Cycle. Estimation of working capital requirements for spinning mill, composite textile mill and garment unit..
Inventory- Inventory control techniques - Economic order quantity, ABC analysis.

Cost Accounting [9]

Cost accounting, compare cost accounting and financial accounting, Elements of costing-Material cost, labour cost and expenses, Methods of costing- Job, Batch and contract costing process costing: joint and by product costing in apparel manufacturing.

Costing in Fabric Preparation [9]

Yarn Conversion cost, Selling price of various wastes. Calculation of Yarn requirements for weaving - Conversion cost from winding to weaving, Knitting Cost - Raw material requirements for knitting, Cost of knitted fabric. Processing Cost - Estimating of cost for Bleaching, Dyeing Printing and Finishing of fabric.

Garment Costing [9]

Costing of garments; factors that determine the price of garments. Calculation of cutting, making and trim costs. Calculation of garment weight of different sizes and style. Accessories Costing, Costing calculation for various testings. Calculation of HOK, OHS.

Total Hours: 45

Text book(s):

1. Pandey I. M., "Financial Management", Vikas Publishing House Pvt. Ltd., New Delhi, 10thEdition, 2012, ISBN: 8125937145 / ISBN: 9788125937142.
2. Varma H K ,"Costing in Textile Industry", Dhanpat Rai publications, New Delhi

Reference(s):

1. Hrishikes Bhattacharya., "Working Capital Management, Strategies and Techniques", Prentice Hall of India Pvt. Ltd., New Delhi, 2014, ISBN: 8120349040 | ISBN-13: 9788120349049.
2. Dr. Ashish K. Bhattacharyya, Principles and Pracitice of Cost Accounting, New Delhi : Prentice Hall (PHI), 2012
3. Bhave P V and Srinivasan V, "Cost accounting in textile mills",ATIRA monograph, Ahmedabad, India
4. Johnson Maurice, E. Moore, "Apparel Product Development", Om Book Service, 2001.

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50 TT 702 – Financial Management and Costing for Textile and Apparel Industry															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	3	2	2	2						1			2	
CO2	2	2	1	3	3				1		2		2	3	
CO3	2	2		3	2						2		2	3	
CO4	2	2		3	2						3	2	3	3	
CO5	2	2		3	2						3	2	3	3	

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K.S.Rangasamy College of Technology – Autonomous R2018								
50 AC 001 – Research Skill Development I								
Semester	Hours / Week			Total Hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	1	0	0	10	0	100	0	100
Objective(s)	• To learn about the effective usage of power point presentation • To prepare presentation with various effects • To visualize the data in the presentation • To acquire knowledge about data sources • To investigate the research articles based on various applications							
Course Outcomes	**At the end of the course, the students will be able to** CO1: Develop presentation with visual effects CO2: Prepare a presentation with supporting data CO3: Attain the importance of research and data collection CO4: Analyze the various sources of research articles CO5: Interpret the tools and methods in preparing manuscript							

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Preparing a Presentation (3)

Presenting data using Power Point- Power Point preparation and presentation, Design principles for creating effective Power Point slides with visuals displaying data. - Profile, - Problem, and a set of basic Excel charts, use to create a presentation.

Creating effective slides using PowerPoint (2)

Create effective slides using PowerPoint. Tools within Power Point, structure story line, create story boards, identify primary elements of slide design, display data and finalize slide presentation.

Research Designs and Data Sources (3)

Overview of the topics: process of data collection and analysis. Starting with a research question - Review of existing data sources- Survey data collection techniques- Importance of data collection- Basic features affect data analysis when dealing with sample data. Issues of data access and resources for access.

Measurements and Analysis Plan (2)

Importance of well-specified research question and analysis plan: various data collection strategies - Variety of available modes for data collection – review of literature - Tools at hand for simple analysis and interpretation.

Total Hours: 10

Text Book(s):

1. Judy Jones Tisdale. Effective Business Presentations. Gulf Coast Books LLC. ISBN-13: 978-0130977359, 2004.
2. Frauke Kreuter. Framework for Data Collection and Analysis,2018. https://www.coursera.org/learn/data-collection-framework

Reference(s)

1. Kothari, C.R. andGaurav Garg, “Research Methodology: Methods and Techniques”, New Age International Publishers, 2013
2. Srivastava, T.N. and Rego, S., "Business Research Methodology", Tata McGrawHill Education Pvt. Ltd., Delhi, 2019.

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50 AC 001 – Research Skill Development I														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3		3	2				2	3	3			3	1
CO2	3	3	1	2	2		2		2	3	2	1		3	2
CO3	3	3	2	2			2		1	3		1	3	3	
CO4	3	3	3	2		2	1	2		3	2	2	3	2	
CO5	3	3	2	2		2	1		2	3	2	2	3	2	

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K.S.Rangasamy College of Technology – Autonomous								R 2018
51 TT 7P1 - Textile CAD Laboratory								
B. Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	0	0	4	60	2	60	40	100

Objective(s)

- To impart training on usage of software in Textile designing.
- To know the application of drafting procedure through computer.
- To understand the industrial pattern drafting system and application.
- To know the pattern grading application through computer.
- To acquire knowledge in measuring the important parameter of colour difference.

Course Outcomes

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

1. Practice to draw the design draft and peg plan for different weaves and it derivatives using win soft software and Demonstrate simulation of checked and striped fabric
2. Calculate the cost of different types of fabrics, Demonstrate simulation of jacquard and dobby designs.
3. Practice to draft the patterns for different garments and Demonstrate grading for different components of a garment
4. Execute marker planning for the patterns and Arrange the components on the lay
5. Calculate the efficiency of laying by placing the components effectively

LIST OF EXPERIMENTS

1. Design, draft and peg plan for plain weave and its derivatives, twill weave and its derivatives and sateen and satin weaves.
   Simulation of stripped and checked pattern on the above weaves. Costing of warp & weft yarn required for the above fabrics.
2. Design, draft and peg plan for twill weave and its derivatives and sateen and satin weaves.
   Simulation of stripped and checked pattern on the above weaves. Costing of warp & weft yarn required for the above fabrics.
3. Design, draft and peg plan for Honey comb, Huck a back, Terry and Bed ford cord weaves.
   Simulation of stripped and checked patterns on the above weaves. Costing of warp & weft yarn required for the above fabrics.
4. Design, draft and peg plan for any one dobby weaves and jacquard weaves.
   Simulation of stripped and checked patterns. Costing of warp & weft yarn required for the above fabrics.
5. Computer aided pattern making, grading and marker planning for the following garments.
   1. Half sleeve shirt
   2. Full sleeve shirt
   3. T-Shirt
6. Computer aided pattern making, grading and marker planning for the following garments.
   1. Romper
   2. Waist coat
7. Computer aided pattern making, grading and marker planning for the following garments.
   1. Skirt blouse
   2. Plain skirt
8. Computer aided pattern making, grading and marker planning for the following garments.
   1. Pleated trousers
   2. Jeans pant

Total Hours : 60

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51 TT 7P1 Textile CAD Laboratory															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2		2		3							2	3		
CO2	2		2		3							2	3		
CO3	2		2		3							2	3		
CO4	2		2		3							2	3		
CO5	2		2	2	3							2	3		

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K.S. Rangasamy College of Technology- Autonomous R 2018								
51 TT 7P2 - Garment Construction Laboratory II								
B. Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	0	0	4	60	2	60	40	100
Objective(s)	• To give hands on training in constructing men's shirts • To give hands on training in construction of men's trousers • To give hands on training in construction of ladies tops & skirts • To give hands on training in construction of churidhar • To give hands on training in constructing of salwar kameez							
Course Outcomes	**At the end of the course, the students will be able to** 1. Construct men's shirts 2. Construct men's trousers 3. Demonstrate the pattern drafting and constructions of tops & skirts 4. Demonstrate the pattern drafting and construction of salwar kameez 5. Demonstrate the pattern drafting and construction of churidhar							

LIST OF EXPERIMENTS

1. Drafting pattern for men's full-sleeve shirt
2. Construction of men's full-sleeve shirt.
3. Drafting pattern for men's formal trousers.
4. Construction of men's formal trousers.
5. Pattern making and construction of men's bermudas.
6. Pattern making and construction of ladies tops.
7. Pattern making and construction of ladies skirts.
8. Pattern making and construction of salwar kameez.
9. Pattern making and construction of leggings.
10. Pattern making and construction of ladies churidhar.
11. Pattern making and construction of ladies night wears.
12. Pattern making and construction of Jeans pants.

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Total Hours:60

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51 TT 7P2 - Garment Construction Laboratory II															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	1		2		1	1			1	2	1	1	
CO2	3	2	1	1	2		1	1		1	1	2	2	1	
CO3	3	2	2	1	2	1	2	1	2	2	1	2	3	2	1
CO4	3	3	2	2	2	1	2	1	2	2	2	2	3	2	1
CO5	3	3	3	2	2	1	2	1	2	2	2	2	3	2	1

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K. S. Rangasamy College of Technology – Autonomous								R 2018
50 TT 7P3 - Project Work - I								
B. Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	0	0	4	60	2	50	50	100
Objective(s)	To make the student understand the practical problem solving process in the industry							
Course Outcomes	1. Identify engineering problems relevant to the domain and collect literature survey for its support 2. Analyze and identify an appropriate technique to solve the problem 3. Do experimentation / fabrication, collect and interpret the data obtained 4. Document, prepare the project report and do the presentation 5. Demonstrate their responsibility as an individual and a leader in group project work							

Each student has to do a project work from any industrial related problems or innovations in technology or critical studies related to textiles (As decided during their VIth semester). The student can undertake the project work individually or in a group not exceeding three students. The works to be undertaken during this phase I is given below:

I. Complete 20% of project work and present their findings in Review I
II. Complete 60% of project work and present their findings in Review II
III. Complete 70% of project work and present their findings in Review III
IV. Complete 100% of project work before the commencement of VIIIth semester

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50 TT 7P3 Project Work - I															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	3	2			2	2	2	1		3	2	1
CO2	3	3	2	3	2			2	2	2	1		3	2	1
CO3	3	3	2	3	2			2	2	2	1		3	2	1
CO4	3	3	2	3	2			2	2	2	1		3	2	1
CO5	3	3	2	3	2			2	2	2	1		3	2	1

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K.S.Rangasamy College of Technology - Autonomous								R 2018
50 TP 0P6 Internship								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit*	Maximum Marks		
	L	T	P		C	CA	ES	Total
VII	0	0	0	-	2	0	100	100

Objective(s)	To give practical industrial exposure to the students on the day-to-day working of textile industries.
Course Outcome(s)	**At the end of the course, the students will be able to** 1. Demonstrate the working of the factory 2. Categorize the machines, products and work force 3. Compare the performance of machines, quality and description of products and efficiency of work force. 4. Compile the data on machine, material men and relevant parameters 5. Discuss the working of machines, product quality, general mill particulars and layout of factory

Each student has to compulsorily undergo an Internship in any one of the textile industry for a minimum period of 4/8 weeks. This has to be carried out after completion of each semester examination and before commencement of the next semester classes.

Each student has to follow the below mentioned guidelines:

1. Drawing the layout plan of building and machineries of the selected.
2. Listing out the Organization chart.
3. Noting down the number of machineries of each type and its technical details-Motor HP, Motor rpm, Production capacity of the machine.
4. Making the production process flow chart.
5. Noting down the existing production details for all products.
6. Noting down the maintenance schedule.
7. Learning regarding inventory and despatch sections.
8. Noting down the allocation of man power for different processes.
9. After completion of training programme a report has to be prepared.
10. The report has to be signed by the Internship Coordinator / HoD.

*** Extra credits will be offered as additional credits depending on the duration of the internship**

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50 TP 0P6 Internship															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3									3			3	2	
CO2	3	2			2					2	3		3	2	
CO3	3	2	2	2	2	2				2	3		3	2	
CO4	3	2	2	3	2	2				2	3		3	2	
CO5	3		3	2	2	2				2			3	3	

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K.S.Rangasamy College of Technology – Autonomous regulation								R2018
Semester VII								
Course Code	**Course Name**	**Hours/Week**			**Credit**	**Maximum Marks**		
		L	**T**	**P**	**C**	**CA**	**ES**	**Total**
50 TP 0P5	**CAREER COMPETENCY DEVELOPMENT V**	**0**	**0**	**2**	**0**	**100**	**00**	**100**

Course Objectives	• To help the learners to practice the written and oral communication skills in the academic and professional contexts • To help the learners to practice the verbal and logical reasoning ability to meet out the requirements of both competitive exams and companies • To help the learners to practice effectively the aptitude modules for company based recruitments and competitive exams • To help the learners to practice effectively the data interpretation and analysis modules for company based recruitments and competitive exams • To help the learners to hone the technical and programming skills for better employability
Course Outcomes	**At the end of the course, the student will be able to** 1. Reinforce the written and oral communication skills in the academic and professional contexts 2. Discriminate and assess the verbal and logical reasoning ability to meet out the employability requirements of the companies 3. Relate the aptitude modules for company based recruitments and competitive exams effectively 4. Compare and illustrate the data interpretation and analysis modules effectively for company based recruitments and competitive exams 5. Formulate and integrate the technical and programming skills to be focused on better employability and code contests.

Unit–1	**Written and Oral Communication**	Hrs
Self-Introduction–GD–HR Interview Skills–Corporate Profile Review-Practices on Company Based Questions and Competitive Exams **Materials:** Instructor Manual		6
Unit–2	**Verbal & Logical Reasoning**	6
Practices on Company Based Questions and Competitive Exams **Materials:** Instructor Manual		
Unit–3	**Quantitative Aptitude**	6
Practices on Company Based Questions and Competitive Exams **Materials:** Instructor Manual		
Unit–4	**Data Interpretation and Analysis**	6
Practices on Company Based Questions and Competitive Exams **Materials:** Instructor Manual		
Unit–5	**Programming & Technical Skills–Part3**	6
Data Structure- Arrays–Linked List–Stack–Queues –Tree–Graph. Practices on Algorithms and Objective Type Questions. **Materials:** Instructor Manual		
	Total	30

Evaluation Criteria

S.No.	**Particular**	**Test Portion**	**Marks**
1	Evaluation1 – Written Test	15 Questions each from Unit 1,2,3,4 & 5 (External Evaluation)	50
2	Evaluation2-Oral Communication	GD and HR Interview (External Evaluation by English, MBA Dept.)	30
3	Evaluation3–Technical Interview	Internal Evaluation by the Dept.– 3 Core Subjects	20
		Total	**100**

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Reference Books

1. Aggarwal,R.S."AModernApproachtoVerbalandNon-verbalReasoning",RevisedEdition2008,Reprint2009,S.Chand&CoLtd.,NewDelhi.
2. AbhijitGuha,"QuantitativeAptitude",TMH,3rdedition
3. Objective Instant Arithmetic byM.B.Lal & Goswami Upkar Publications.
4. Word Power Made Easy by Norman Lewis W.R.GOYAL Publications

Note:

- InstructorcancoverthesyllabusbyClassroomactivitiesandAssignments(5Assignments/week)
- InstructorManualhasClassworkquestions,AssignmentquestionsandRoughwork pages
- Each Assignment has 20 questions for Unit 1,2,3,4&5 and Unit 5and5questionsfromUnit5(Algorithms)&Unit 1(Oral Communication)
- Evaluation has to be conducted as like Lab Examination.

COURSE CODE & COURSE NAME	CO	PO												PSO		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
50 TP 0P5– Career Competency Development V	CO1	1	1	1	1	1	2	1	1	2	3	2	3	1	1	2
	CO2	2	1	2	2	1	2	1	1	2	3	3	3	1	1	1
	CO3	2	1	2	2	1	1	1	1	2	3	2	3	2	2	1
	CO4	2	2	2	2	2	1	1	1	2	3	3	3	2	1	1
	CO5	2	2	2	2	2	2	2	2	2	3	2	3	3	2	1

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VIII SEMESTER

K.S.Rangasamy College of Technology – Autonomous R2018								
50 AC 002 – Research Skill Development II								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VIII	1	0	0	15	0	100	0	100

Objective(s)	• To identify the ethics in preparing research paper • To organize manuscript for submission • To attain knowledge for filing Patent • To apply for copy right • To develop and deploy Mobile App. in play store
Course Outcomes	**At the end of the course, the students will be able to** CO1: Prepare a manuscript for journal publication. CO2: Apply the manuscript for publication CO3: Interpret the process of obtaining copyright and patent CO4:Analyze the various provisions to share the application CO5:Create and publish the mobile application in the digital store

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Preparation of Manuscript (3)

Data necessary before writing a paper: the context in which the scientist is publishing. Learning and identification of research community - advantages of scientific journal publication and manuscript preparation - ethical values in publishing.

Writing the paper (2)

Writing research paper - structure of the paper - usage of bibliographical tools - abstract preparation and to do a peer review for the abstract of the others, as in real academic life. Plagiarism of the prepared manuscript.

Copyright (2)

Copyright law in India-Meaning of copyright-Classes of works for copyright protection -Ownership of Copyright-Assignment of copyright-Intellectual Property Rights (IPR) of Computer Software-Copyright Infringements-Procedure for registration

Patents (3)

Patent System In India -Types of Patent Applications-patentable invention - Not patentable-Appropriate office for filing -Documents required Publication and Examination of Patent Applications -Grant of Patent-Infringement of Patents -E-filing of Patent applications

Deploying Mobile App. in play store (5)

Introduction to Application Stores – Play Store, App Store, Microsoft Store, Creating App – Android, iOS, UWP, Defining Manifest, Certifying App, Create Store Listing, Sharing Screenshots, Sharing App Credentials for Testing.

Total Hours: 15

Text Book(s):

1.	Mathis Plapp. How to Write and Publish a Scientific Paper (Project-Centered Course). https://www.coursera.org /learn/how-to-write-a-scientific-paper#instructors
2.	Rajkumar S. Adukia ,Handbook On Intellectual Property Rights In India,2007
3	Dr. M. Kantha Babu ,"Text book on Intellectual Property Rights",2019.

Reference(s)

1.	Kothari, C.R. andGaurav Garg, "Research Methodology: Methods and Techniques", New Age International Publishers, 2013
2.	Srivastava, T.N. and Rego, S., "Business Research Methodology", Tata McGrawHill Education Pvt. Ltd., Delhi, 2019.
3.	https://support.google.com/googleplay/android-developer/answer/9859152
4.	https://developer.apple.com/ios/submit/
5.	https://docs.microsoft.com/en-us/windows/uwp/publish/app-submissions

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50 AC 002 – Research Skill Development II															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	3	3				3		2	3	1		3	1
CO2	3	3	3	3			1	2	2	2	2	1		3	2
CO3	3	3	2	2	2		2	2	1	2	1	1	3	3	
CO4	3	3	3		3	2	2		2		2	2	3	2	
CO5	3	3	3		3	2	2		2		2	2	3	2	

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K. S. Rangasamy College of Technology – Autonomous								R 2018
50 TT 8P1 - Project Work - II								
B. Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
VIII	0	0	16	240	8	50	50	100
Objective(s)	To make the student understand the practical problem solving process in the industry							
Course Outcomes	1. Identify engineering problems relevant to the domain and collect literature survey for its support 2. Analyze and identify an appropriate technique to solve the problem 3. Do experimentation / fabrication, collect and interpret the data obtained 4. Document, prepare the project report and do the presentation 5. Demonstrate their responsibility as an individual and a leader in group project work							

The student can undertake the project work individually or in a group not exceeding three students. The work has to be carried out in the college / institute. The works to be undertaken during this phase II is given below:

I. Demonstrate and present their entire project work with results and discussions in Review 0

II. Submit first draft of research paper/patent/demo the mobile app development in Review I

III. Show the evidence of paper submission in journal / filed a patent / demo in the play store for mobile app development in Review II

IV. Complete project report, paper publication in journals / status of patent / Availability of app in play store in Review III

Complete all works before the last instruction day of that particular semester

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50 TT 8P1 Project Work - II															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	3	2	3	2			2	2	2	1	2	3	2	1
CO2	3	3	2	3	2			2	2	2	1	2	3	2	1
CO3	3	3	2	3	2			2	2	2	1	2	3	2	1
CO4	3	3	2	3	2			2	2	2	1	2	3	2	1
CO5	3	3	2	3	2			2	2	2	1	2	3	2	1

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Professional Electives

K.S.Rangasamy College of Technology – Autonomous								R2018
50 TT E 11 - High Performance Fibres								
B.Tech. Textile Technology								
Elective	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	3	0	0	45	3	50	50	100

Objective(s)	• To comprehend the basics of advanced spinning technology • To know various methods of manufacturing high performance fibres • To acquire knowledge on their applications in various fields • To gain concepts on testing procedure of materials • To obtain information on special fibres
Course Outcomes	**At the end of the course, the student will be able to** 1. Compare the conventional and advanced spinning process 2. Demonstrate the manufacturing process of high performance fibres. 3. Analyze the properties of fabrics produced using chemical and thermal resistant fibres 4. Explain the application of high performance fibres in Medical field 5. Evaluate the performance of specialty fibres

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Advanced Spinning Technology

Advances in conventional fiber forming process; gel spinning; Dry-jet-wet spinning; liquid crystal spinning; electro-spinning. [9]

High Performance Fibres For Industrial Applications

Manufacturing, properties and applications of glass fibers, basalt fibers; carbon fibers, high performance polyethylene fibers. [9]

Chemical and Thermal Resistant Fibres

Manufacture of aramid fibers; properties and application of aramid fibers; Basofil and Ceramic fibers, Sulphur fibers, properties and applications of PBO, PBI and PI fibers. [9]

High Performance Fibres for Medical Applications

Manufacturing, properties and applications of alginate fibers; chitin and chitosan fibers; regenerated silk and wool protein fibers; synthetic biodegradable fibers like PLA and SAF. [9]

Specialty Fibres

Hollow and profile fibers; blended and bi-component fibers; film fibers and functionalized fibers for specific applications. [9]

Total Hours: 45

Text book(s):

1.	Kothari V.K., “Textile Fibers: Development and Innovations”, Vol. 2, Progress in Textiles, IAFL Publications, 2000.
2.	Peebles L.H., “Carbon Fibers”, CRC Press, London, 1995.

Reference(s) :

1.	Hearle J.W.S., “High Performance Fibers”, Wood head Publishing Ltd., Cambridge, England, 2001
2.	Hongu T. and Phillips G.O., “New Fibers”, Wood head Publishing Ltd., England, 1997
3.	J Gordon Cook, “Handbook of Textile Fibres: Man-Made Fibres: 2”, Wood head Publishing Series in Textiles, 1984
4.	T. Nakajima, “Advanced Fiber Spinning Technology”,1st Edition, Wood head Publishing, 1994.

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50 TT E11 – High Performance Fibres															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	2								1			2		
CO2	3	1								1			2		
CO3	2	3								2			3		1
CO4	2	3													
CO5	2	2										1			2

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K.S. Rangasamy College of Technology - Autonomous								R 2018
50 TT E 12 - Man Made Fibre Technology								
B.Tech. Textile Technology								
Elective	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	3	0	0	45	3	50	50	100

Objective(s)	• To enable the students to learn about the polymer rheology and the laws • To acquire knowledge on melt spinning • To gain knowledge on solution spinning • To comprehend the post spinning operations • To obtain ideas on new developments in fibre spinning
Course Outcomes	**At the end of the course, the students will be able to** 1. Discuss polymer rheology and the laws 2. List various spinning techniques of polymers and parameter involved in spinning synthetic yarn 3. Explain Properties and application of synthetic yarns 4. Outline the need of various post spinning operations 5. Describe advances in the spinning process

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Polymer Rheology

Spinability of liquids, rheology of spinning, formation of fibre structure. [7]

Melt Spinning

Melt Spinning- Polymer Selection and Preparation, equipment, properties and applications of polyester, polyamide and polypropylene fibres. [9]

Solution Spinning

Solution spinning- Polymer Selection and Preparation, equipment, properties and applications of aramid, acrylic, polyurethane and regenerated cellulose fibres. [9]

Post Spinning Operations

Neck drawing, drawing systems, influence of drawing on structure and properties of fibres; Types of heat setting, influencing parameters on heat setting, influence of heat setting on fibrebehaviour; Spin finish composition and application; Evaluation methods; Texturising – Need and methods. Textured yarn characteristics. [10]

Developments in Fiber Spinning

Liquid crystal spinning; Gel spinning, Electro spinning; Profile fibres, hollow and porous fibres; Specialty fibres poly glycolic acid, polylactic acid, chitosan fibres preparation properties and applications. [10]

Total Hours: 45

Text book(s):

1. Kothari V. K., “Textile Fibres: Development and Innovations”, Vol. 2, Progress in Textiles, IAFL Publications, New Delhi, 2000
2. Vaidya A. A., “Production of Synthetic Fibres”, Prentice Hall of India Pvt. Ltd., New Delhi, 1988

Reference(s) :

1. Gupta V. B. and Kothari V. K. (Editors), “Manufactured Fibre Technology”, Kluwer Academic Publishers, 1997.
2. Cook J. G., “Handbook of Textile Fibres: Vol. 2: Man Made Fibres”, The Textile Inst., 5th Ed. 1984.
3. Srinivasa Murthy H. V., “Introduction to Textile Fibres”, Textile Association, India, 1987.
4. Nakasjima (English edition, edited by Kajiwara K. and McIntyre J. E.), “Advanced Fibre Spinning Technology”, Wood head Publication Ltd., England, 1994.

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50 TT E12 – Manmade Fibre Technology															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2		2					2		2	2	1	
CO2	3	2	2	2	2		2			2		2	2	1	
CO3	2		1		2	2	2	1		1			2	1	
CO4	2	2	2	2			2			2		2	2	1	
CO5	3	2	2	2	2		2	1		2		3	2	1	

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K.S.Rangasamy College of Technology – Autonomous								R 2018
50 TT E 13 -Textured Yarn Technology								
B.Tech. Textile Technology								
Elective	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	3	0	0	45	3	50	50	100
Objective(s)	• To impart knowledge on heat setting and mechanism of texturing. • To understand the different methods of texturing • To impart the knowledge on characteristics and various end uses of texturing • To explain the concepts of different textured yarns • To enable the students to prepare technological solutions for challenges in the area of texturing							
Course Outcomes	**At the end of the course, the students will be able to** 1. Explain the raw materials required for texturing and explain basic principles and methods of texturing. 2. Describe the factors involved and mechanism of heat setting, discuss the fiber morphology and yarn properties during heat setting. 3. Explain about the twisting device ,heating ,cooling and take-up systems of false twist texturing and discuss about characteristics of feed yarns and process parameter like time and temperature 4. Describe the air jet texturing yarn production, express airflow pattern in different types of nozzles, loop formation mechanism and analyze the evaluation of air-jet textured yarn. 5. Describe the working procedure of stuffer box, edge crimping, and knit-de-knit, gear crimping, bi-component filament texturing and differential shrinkage texturing.							

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Introduction
Need for bulking of synthetic yarns; texturability of fibres, state and quality of raw material required; classifications, Basic principles and methods of texturing. [8]

Heat Setting
Heat setting – need, types of setting, mechanism, factors involved; effect on fibre morphology and yarn properties; evaluation of heat setting processes; fundamentals of thermo-mechanical texturing, Helanca process. [9]

False Twist Texturing
Draw texturing - simultaneous and sequential draw texturing; twisting devices; heating and cooling systems; take-up systems; characteristics of feed yarns; process parameters-time, temperature, twist, tension; evaluation of false-twist textured yarns; end-uses. [9]

Air Jet Texturing
Types of yarns produced; airflow pattern in different types of nozzles; loop formation mechanism, factors involved; evaluation of air-jet textured yarn; comparison of air-jet textured yarn with spun and false twist textured yarns; end-uses. [10]

Other Methods of Yarn Texturing
Stuffer box, edge crimping, knit-de-knit and gear crimping methods; bi-component filament texturing; differential shrinkage texturing; chemo - mechanical texturing; limitations and applications. [9]

Total Hours: 45

Text book(s):

1.	Hes L. Ursiny P., “Yarn Texturing Technology”, Eurotex, U.K., 1994.
2.	Behery H.M. and Demir A., “Synthetic Filament Yarn Texturing Technology”, Prentice Hall, 1996, ISBN 0134400259.

Reference(s) :

1.	Guirajani M.L. (Edr.), “Annual Symposium of Texturing”, I.I.T Delhi, 1977.
2.	Wilson D.K. and Kollu T., “Production of Textured Yarns by the False Twist Technique”, Textile Progress, Vol. 21, No.3, Textile Institute, Manchester, U.K., 1991.
3.	Gupta V.B. (Edr.), “Winter School on Man-made Fibers – Production, Processing, Structure, Properties and Applications”, Vol. 1, 1988.
4.	J.W.S. Hearle, L.Hollick, D.K.Wilson, “Yarn Texturing Technology”, Wood head, 2001, ISBN 0849313104, 9780849313103.

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50 TT E 13 –Textured Yarn Technology															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	1	1										3	3	
CO2	3	2	1										3	3	
CO3	2	1	1										2	2	
CO4	2	2	2										2	2	
CO5	2	2	2										3	2	

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K.S.Rangasamy College of Technology – Autonomous								R2018
50 TT E 14 - Process Control in Spinning								
B.Tech. Textile Technology								
Elective	Hours / Week			Total hours	Credit	Maximum marks		
	L	T	P		C	CA	ES	Total
I	3	0	0	45	3	50	50	100

Objective(s)	• To make the student to be conversant with following studies of process and quality control in spinning. • To know the scope of process control and statistical application. • To know the control of waste generation, yarn quality, raw material and productivity. • To select suitable raw material and machinery set-up for the manufacturing of the yarn and fabrics with required quality. • To know about outline of parameters for the satisfactory performance of various intermediate processes involved in spinning.
Course Outcomes	**At the end of the course, the students will be able to** 1. Understand the concept of process control and know the process control in mixing, spinning preparatory, HVI, AFIS. 2. Analyze the characteristic of fibre quality and spinnability and explain the concept of nep and hook generation and nep removal. 3. Know the estimation of yarn realization, cleaning efficiency and cleaning intensity, understand the concept of waste control. 4. Explain the assessment of yarn unevenness and imperfections and know the yarn faults and their remedies 5. Analyze the cause for maximizing the production and identify parameters for satisfactory performance of intermediate processes in spinning.

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Process Control Concept and Statistical Application

Scope of process control in spinning - Identification of process variables and product characteristics to control process in the blow room, card, draw frame, comber, speed frame and yarn spinning - Concepts of developing norms and standards for spinning process. Application of statistical techniques in process and quality control. Use of HVI and AFIS for process control operation. [9]

Control of Raw Material Quality

Quality control of mixing quality through fibre quality characteristics – Concept of fibre quality index and its application – Prediction of spinnability and yarn quality – Blending irregularity;- fibre rupture analysis- Causes of nep and hook generation –.nep removal in carding and combing machines. Online monitoring and control of neps and hooks on modern cards; Measurement of neps and hooks. [9]

Control of Yarn Realization and Waste

Estimation of yarn realization – Determination of trash content and cleaning efficiency, cleaning intensity in blow room and carding – Determination of comber noil and combing efficiency – Control of waste in blow room, carding and comber - Control of hard waste. [9]

Yarn Quality Control

Assessment of within and between bobbin count variations, Assessment and control of count variations in preparatory machines and ring frame –Assessment of yarn unevenness and imperfections - causes for unevenness and imperfections- analysis and interpretation spectrograms – unevenness caused by random fibre arrangement – Drafting waves – Periodic variation. Yarn faults – classification – assessment of faults – causes and methods to reduce faults. Causes for variability in strength, elongation and hairiness and measures for their control. [9]

Production Control

Factors affecting the productivity in ring spinning. Productivity indices. Methods for maximizing production in spinning machinery – New concepts. Effect of Machinery maintenance and Humidity on production; balancing of machineries. [9]

Total Hours: 45

Text Book(S) :

1. Garde. A. R. & Subramaniam T. A., “Process Control in Spinning”, ATIRA, Ahmedabad 1989.
2. Ratnam T.V. & Chellamani. K. P., “Quality Control in Spinning”, SITRA Coimbatore

Reference(S) :

1. Chattopadhyay R., “Advances in Technology of Yarn Production”, NCUTE Publication, New Delhi, 2002.
2. Lord P.R, “Yarn Production; Science, Technology, and Economics”, The Textile Institute, Manchester,1999.
3. Furter.R., “Strength and Elongation Testing of Single and Ply Yarns”,&“ Eveness Testing in Yarn Production”, (Part II), The Textile Institute, Manchester, U.K., 1985.
4. Furter.R., “ Eveness Testing in Yarn Production”, (Part II), The Textile Institute, Manchester, U.K., 1982

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50 TT E 14 – Process Control in Spinning															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	1	1										3	2	
CO2	3	2	1			2					1		3	2	
CO3	2	1	1			2					2		2	2	
CO4	2	2	1			2					1		2	2	
CO5	2	2	1			2					1		2	2	

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K.S.Rangasamy College of Technology-Autonomous								R 2018
51 TT E 15 - Home Textiles								
B.Tech. Textile Technology								
Elective	Hours / Week			Total hours	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
I	3	0	0	45	3	50	50	100

Objectives	• To acquire knowledge on recent developments in furnishing and other home textile products. • To analyze textiles based products used in home textiles. • To acquire knowledge on various flammability requirements of home textiles. • To acquire knowledge on recent developments in floor covering home textile products. • To know the various designs / styles of bed linen classification, types of mattresses and mattresses covers.
Course Outcomes	**At the end of the course, the students will be able to** 1. Describe different types fabrics, finishes and surface ornamentation on home textiles. 2. Compare different furnishings and analyzing factors influencing in the selection of home furnishings for different products. 3. Discuss the type sand end uses of different floor coverings and analyze the types and factors influencing of different floor coverings. 4. Describe the types of doors, windows and their choice of fabrics used in curtains and draperies. **5.** Evaluate the properties of home textiles and describe the home decoration articles and bed linens**.**

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Introduction

Introduction to home textiles; definition and classification of home textiles, Furnishing materials - woven, non-woven and knitted; different types of fibres used for home textile; eco-friendly home textiles; Special finishes and surface ornamentation on home textile products; Indian home textiles industry and its future prospects. [9]

Furnishings

Types of furnishings used for different interiors- living room, dining room, kitchen, bed room, bathroom and kids room. Home decorations- sofa covers, cushion, cushion cover, upholsteries, wall hangings, bolster, bolster covers and throws; Factors influencing the selection of home furnishings for different interiors; Requirements of furnishing for different interiors, role of fabrics in interior furnishing. [9]

Floor Coverings

Soft floor covering -carpet, rugs, pads and carpet cushion; Fibres used; salient of features of carpet, rugs, cushions and pads ; Factors influencing the selection of different floor covering and its maintenance, recent developments. [9]

Curtains and Draperies

Different types of doors and windows used; Curtains and draperies- types and choice of fabrics, calculating the material required for curtains, construction of curtains for different types of windows and doors; Method of finishing draperies; Developments in tucks, pleats, uses of drapery rods, hooks, tape rings and pins. [9]

Linens

Bed linens- classification and types of mattresses and mattresses covers; quilt, quilt cover, bed spreads, blankets, comforts and comfort covers, pads, pillows ; Properties required for hotel and hospital linens; recent developments. Testing of home textile-abrasion, antimicrobial, flammability, shrinkage and color fastness. [9]

Total Hours: 45

Text Book(S) :

1. Alexander. N. G., “Designing Interior Environment”, Mas Court Brace Covanorich, New York, 2001
2. Wingate IB & Mohlen J.F. “Soft Furnishings”. Prentice Hall Inc, New York, 2000

Reference(S) :

1. Donserkery K. G., “Interior Decoration in India”, D. B. Taraporevala Sons and Co. Pvt Ltd., 1993
2. Robert Harding, “Curtains, Blinds and Valances”, Egatemoss, Ohio, 1998
3. Brian D Coleman, “Luxurious Home Interiors”, Gibbs Smith Publication, Hong Kong, 2004
4. Wingate IB & Mohlen J.F. “Textile Fabrics and Their Selection,” Prentice Hall Inc, New York, 2000

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51 TT E 15 - Home Textiles															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3									2			3	2	
CO2	3	2								2			3	2	
CO3	3	2								2			3	2	
CO4	3									2			3	2	
CO5	3	3	3	3	3					2			3	2	

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K.S. Rangasamy College of Technology-Autonomous							R 2018
50 TT E 21 - Theory of Textile Structures							
B.Tech Textile Technology							
Elective	Hours / Week			Total hrs	Credit		Maximum Marks	
	L	T	P		C	CA	ES	Total
II	3	0	0	45	3	50	50	100

Objective(s)	• To impart the fundamental knowledge about yarn geometry • To impart the fundamental knowledge about fibre migration • To impart knowledge on mechanics of staple fibre and filament yarns • To impart knowledge on geometry of fabric structure • To impart knowledge on geometry of knitted and non woven fabrics
Course Outcome	**At the end of the course, the students will be able to** 1. Explain the geometry of twisted yarn and concept of packing of yarn 2. Explainthemechanismofmigrationbehaviorofspunyarnandconceptofyarntwisting 3. Discussthetensilebehaviorofyarnandconceptofyarnslippageanditsinfluencing factors 4. Explain the geometry of fabric in various models and deformation of fabric during tensile, shear and drape. 5. Discussthegeometryofknittedstructuresandloadextensionbehaviourofknitted fabric and non woven fabric.

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Yarn Geometry

Basic geometry of twisted yarn; Idealized helical yarn structure; Yarn count &twisttactor; Twist contraction; Limits of twist; Packing of fibres in yarn - idealized packing, packing in yarns, specific volume of yarns; Relation between twist, diameter and twist angle. [9]

Fibre Migration

Ideal migration; Characterization of migration behavior; Migration in spun rayon yarns; Mechanism of migration; Form of yarn twisting: Cylindrical and ribbon twisting. [9]

Mechanics of Filament / Staple Fibre Yarns

Filament Yarn: Analysis of tensile behavior; Analysis for large extension; Prediction of breakage; Analysis of yarn mechanics by energy method; Observed extension and breakage of continuous filament yarns.

Staple fibre yarn: Theoretical analysis of yarn geometry; Stress-strain distribution in yarn; Fibre obliquity and slippage; Influence of fibre length, fineness and friction on fibre slippage and yarn strength. [9]

Geometry of Fabric Structure

GeometryofPierce,OlofsonandHamalton"smodels;coverfactor;crimpinterchange;ModificationtoPierce model- race track, saw tooth and bilinear models; Application of cloth geometry; Geometrical solution during extension of cloths; Load - extension modulus; Concept of maximum weavability in woven fabrics; Deformation on shear and drape of fabrics. [9]

Geometry of Knitted Fabrics and Non Wovens

Geometry of plain knitted structures and complex knitted structures; Mechanics of knitted fabrics- warp wise load extension, biaxial stress behavior, weft wise extension. Geometry of non-woven fabrics. [9]

Total Hours: 45

Text book(s):

1.	J.W.S.Hearle, P.Grosberg, and S.Backer, “Structural Mechanics of Fibres, Yarns and fabrics”, Willre Interscience, New york, 1969.
2.	B.C. Goswami, J. Martindale and Scandio, “Textile Yarns: Technology, Structure and Application”, Wiley-Interscience, New York, 1977.

Reference(s) :

1.	Peirce F T and Womersley J R, “Cloth Geometry”, reprint, The Textile Institute, Manchester 1978.
2.	Clifton G.Overholser, “Theory of Textile Structure”, Random Publications, 2013.
3.	B K Behera Professor and P K Hari, “Woven Textile Structure: Theory and Applications”, Wood head Publishing Ltd., 2010.
4.	Jinlian Hu, “Structure and Mechanics of Woven Fabrics”, Wood head Publishing Ltd., 2004.

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50 TT E 21 – Theory of Textile Structures														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	1	1	2	1			1	1	1	1	1		
CO2	2	2	1	1	2	1			1	1	1		1		
CO3	2	2			2	1	1	1	1	2	1		1	1	
CO4	3	2		1	2	1	1	1	1	2	1	1	1	1	1
CO5	2	2	1	1	2	1	1	1	1	2	1	1	1	1	1

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K.S.Rangasamy College of Technology- Autonomous							R 2018
50 TT E 22 - Process Control In Weaving and Chemical Processing							
B.Tech. Textile Technology							
Elective	Hours / Week			Total hrs	Credit	Maximum Marks	
	L	T	P		C	CA	ES	Total
II	3	0	0	45	3	50	50	100

Objective(s)	• To impart the knowledge on process control in winding. • To impart the knowledge on process control in warping and sizing. • To impart the knowledge on process control in weaving • To impart the knowledge on process control in preparatory process. • To impart the knowledge on process control in dyeing, printing and finishing.
Course Outcomes	**At the end of the course, the students will be able to** 1. State the process control in warp and weft winding. 2. Describe the process control of warping and sizing 3. Explain the control of loom shed, loss of efficiency by snap reading and hard waste control. 4. Organize process control measures in preparatory process. 5. Develop process control measures in dyeing, printing and finishing process.

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Process control in winding

Scope and approach of process control in warp winding - control of quality of knot, producing good packages, control of efficiency of fault removal, process parameters, performance in winding; Process control in pirn winding-Scope and approach, Minimising end breaks, stoppages due to mechanical failures. [9]

Process control in warping and sizing

Scope and approach of process control in warping and sizing- minimising end breaks in warping, performance, quality and productivity in warping; Choice of size recipe and size pick- up, preparation of size recipe, control of size pick-up, control of yarn stretch and moisture in sized yarns, quality of sized beams, control of productivity and size losses. [9]

Process control in weaving

Scope and approach of process control in weaving- control of loom speed and loom efficiency, control of loss of efficiency by snap reading, loom performance, quality of yarn and loom allocation; Fabric defects, causes, control measures. Inspection standard, cloth realization. Online and off-line process control; Cost control in weaving. [9]

Process control in Wet processing (Preparatory Process)

Process control in Preparatory Process- Grey Inspection of Fabrics, Process control measures in desizing, scouring, souring, bleaching and mercerization; Important functions of a control laboratory in a modern process house. Quality evaluation of preparatory processed material. [9]

Process control in Dyeing , Printing and Finishing

Process control measures in dyeing, printing and finishing - Process control in dyeing of various materials; Process control in various printing methods; Process control in various finishing methods. [9]

Total Hours: 45

Text book(s):

1.	AbihijitMajumdar, Apurba Das, Algarsamy.R and Kothari.V.K, “Process control in Textile manufacring”, Woodhead Publishing Ltd, New Delhi, 2013.
2.	Thilagavathi.G and Karthi.T “Process control and yarn quality in Spinning” Woodhead Publishing, 2015.

Reference(s) :

1.	Stanley Bernard Brahams, “The Fundamentals of Quality Assurance in the Textile Industry” Hardcover publisher, 2016
2.	Georgi Damyanov and Diana Germanova-Krasteva, **“**Textile Processes: Quality Control and Design of Experiments” Hard cover publisher, 2013.
3.	Process control in weaving, ATIRA Publications, ATIRA.1974
4.	Chemical Processing Tablet, “Process and Quality Control in Chemical Processing” – Textile Association of India publication, 1984.

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50 TT E 22 - Process Control In Weaving and Chemical Processing															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2							2			3	2	
CO2	3	2	2							2			3	2	
CO3	3	2	2							2			3	3	
CO4	3	2	2							2			3	3	
CO5	3	2	2							2			3	3	

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K.S.Rangasamy College of Technology-Autonomous								R2018
50 TT E 23 - Protective Textiles								
B.Tech. Textile Technology								
Elective	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
II	3	0	0	45	3	50	50	100

Objective(s)	• To provide an overview about the material selection, design and standard for protective textiles. • To taught the various hazards and treatment methods to vanquish the hazards • To educate the scope and functions of intelligent textiles in protective applications. • To inculcated the construction of various protective garments. • To enlighten the requirement for defense application and to evaluate the protective garment.
Course Outcomes	**At the end of the course, the students will be able to** 1. Understand the functional requirements, Standards and Garment Designing for different protective applications 2. Classify the various types of hazards & contour the Surface treatments required for protective textiles 3. Outline the functions of smart textiles & categorize the various protective textile application. 4. Designate the civilian, chemical & biological protective textiles. 5. Encapsulate the protective materials for defense & other industries.

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Materials, Standards and Design for Protective Textiles

Introduction, Definition, Classification, Materials and technologies, Fibres and Fabrics for protective textiles. Steps in the selection of protective clothing materials. Market potential of protective textiles, Standards -Requirements, International standards, Certification. Design - Factors influencing the design development process, Clothing systems and functionality, Harmonize fashion and function. [9]

Hazards &Surface treatments for protective textiles

Introduction, Types of hazards, Mechanical hazards - Ballistic and knife protection, Blunt impact protection. Chemical and biological hazards. Electrical and radiation hazards Environmental and fire hazards, Surface treatment – Types, pre treatments for protective textiles, Different finishes for protective textiles, Fundamental & Modern treatment process. [9]

Intelligent textiles and Protection against UV, Thermal, Ballistic & other hazards

Smart textiles, Applications of smart textiles for protective purposes, Sensor function, Data processing, Actuators, Energy, Communication, Electric actuation.

Textiles for UV protection, Textiles for protection against cold, Thermal (heat and fire) protection, Ballistic protection, Microorganism protection, Textiles for respiratory protection, Electrostatic protection. [9]

Protection against Civilian, Chemical and biological protection

Classification of chemical protective clothing, Garment types, materials, design features and sizing, Garment material chemical resistance testing, Chemical protective clothing integrity performance & properties. Protective clothing for Firefighters and Protection for workers in the oil and gas industries. [9]

Protective textiles for defense and Evaluation of Protective Garments

Introduction, General requirements for military protective textiles, Camouflage, concealment and deception, NBC protection.

Evaluation of protective fabrics – desirable properties of protective textiles, method of testing for thermal protective performance, water, cold, abrasion and wear resistance; evaluation of resistance to electrostatic and electrical resistivity, impact properties. [9]

Total Hours: 45

Text book(s):

1.	Richard. A.Scott, Textiles for Protection, CRC press, Woodhead Publication, USA, 2005.
2.	F. Wang and C. Gao., “Protective Clothing Managing Thermal Stress” Woodhead Publishing Series in Textiles, 2014.

Reference(s):

1.	ASTM Standards on Protective Clothing Textbook Solutions
2.	Cherilyn N. Nelson, Norman W. Henry., Performance of Protective Clothing: Issues and Priorities for the21st Century. ASTM International, 2000.
3.	Krister Forsberg, Ann Van den Borre, Norman Henry, III, James P. Zeigler , Quick Selection Guide to Chemical Protective Clothing, 6th Edition, Wiley, June 2014.
4.	T.Matsuo, “Fiber materials for Advanced Technical Textiles”, CRC publication, 2008.

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50 TT E 23 - Protective Textiles															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2		3	3	2	1	2			2		2	2	1	1
CO2	2		3	3	2	1	2			2	2	2	2	2	
CO3	2		3	3	3	1	2			2	2	2	2	2	
CO4	2		3	3	2	1	2			2	2	2	2	2	
CO5	2		3	3	3	1	2			2	2	2	2	2	

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K.S.Rangasamy College of Technology-AutonomousR2018								
50 TT E 24 - Medical Textiles								
B.Tech. Textile Technology								
Elective	Hours / Week			Total hrs	Credit		Maximum Marks	
	L	T	P		C	CA	ES	Total
II	3	0	0	45	3	50	50	100

Objective(s)	• To impart the knowledge on selection of fibers for making medical textiles. • To explain the knowledge on fabrics and its requirements for medical textiles. • To understand the manufacturing techniques of various medical textile products. • To impart the knowledge on characteristics and various end uses of medical textile products. • To understand the limitations of various herbals used in medical textile industries.
Course Outcomes	**At the end of the course, the students will be able to** 1. Discuss the properties of biomaterials for medical textiles and the properties of specialty medical fibres. 2. Describe the production techniques and properties of healthcare products and understand the materials and treatment needed for hygiene product development. 3. Explain the manufacturing technique of bandages and evaluate the characteristics of bandages. 4. Discuss the requirements of wound dressing and explain the kinds of wound care dressing. 5. Describe the materials and properties required for sutures, vascular grafts and explain the properties of ligaments, tendons and scaffolds.

Bio Materials

Bio materials – metals, ceramics, composites and textile materials; specialty medical fibres Biopolymers: classification and their properties, requirements, and applications, testing methods. Herbal textiles for medical applications. [9]

Health Care Textiles

Healthcare and hygiene products types; advanced textile materials in healthcare; infection control and barrier materials; study of non-woven hygienic products; plasma treated barrier materials. [9]

Bandages

Specification, properties and manufacture of range of bandages and pressure garments - elastic and non elastic compression bandages, support and retention bandages, bandaging textiles, evaluation of bandage and bandages for various end uses. Drug delivery textiles: classification – mechanism various fabrication methods – characterization – applications. [9]

Wound Care

Wound – types, healing process; requirement of wound dressing; an overview of wound care materials - study of various kinds of wound care dressing and advanced wound dressings. Wound compression textiles; Reusable medical textiles: types, advantages, physical properties and performance - reusable processing methods. [9]

Implantable Products

Implantable products; sutures – requirements, classifications, specifications, materials used –their properties and application; vascular grafts, artificial ligaments, artificial tendons and scaffolds; intelligent textiles for medical applications. [9]

Total Hours: 45

Text book(s):

1.	Allison Mathews and Martin Hardingham ., “Medical and Hygiene Textile Production - A hand book”, Intermediate Technology Publications, 1994.
2.	Anand S.C., Kennedy J.F. Miraftab M. and Rajendran S., “Medical Textiles and Biomaterials for Healthcare”, Wood head Publishing Ltd. 2006.

Reference(s) :

1.	Anand S., “ Medical Textiles”, Textile Institute, 1996, ISBN: 185573317X
2.	Horrocks A.R. and Anand S.C, “Technical Textiles”, Textile Institute, 1999, ISBN: 185573317X.
3.	Adanur S., “Wellington Sears Handbook of Industrial Textiles”, Technomic Publishing Co., Inc., Lancaster Pennylvania 1995, ISBN 1-56676-340-1.
4.	Joon B. Park. and Joseph D. Bronzino., “Biomaterials – Principles and Applications”, CRC Press BocaRaton London, NewYork, Washington , D.C. 2002

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50 TT E 24 - Medical Textiles															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2		3	3	2	1	2			2		3	2		
CO2	2		3	3	2	1	2			2	2	3	2		
CO3	2		2	2	2	1	1			1		3	2		
CO4	2		3	3	2	1	2			2		3	2		
CO5	2		3	3	2	1	2			2	2	3	2		

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Rev. No. 3 / w.e.f. 18/01/2023, Passed in BoS Meeting held on 22/12/2022,
Approved in Academic Council Meeting held on 07/01/2023.

K.S.Rangasamy College of Technology – Autonomous R 2018								
50 TT E 25 - Apparel Marketing and Merchandising								
B. Tech. Textile Technology								
Elective	Hours / Week			Total hrs	Credit		Maximum Marks	
	L	T	P		C	CA	ES	Total
II	3	0	0	45	3	50	50	100

Objective(s)	• To impart the knowledge of apparel marketing. • To impart the knowledge of apparel merchandising. • To impart the knowledge of time management • To impart the knowledge of pricing and sourcing. • To impart the knowledge of documentation in apparel business.
Course Outcomes	**At the end of the course, the students will be able to** 1. Comprehend the basic concepts of apparel marketing, types of marketing research, marketing strategies and various types of advertising and labeling. 2. Discuss the role & responsibilities of a merchandiser and requirements of a merchandiser. Types of buyers and concepts of visual merchandising techniques 3. Practice the pricing theory and the concepts of sourcing of different materials, Manufacturing Resources Planning , JIT and lean manufacturing 4. Discuss the various production scheduling techniques and process follow up for yarn, knitting and processing, the application of computer in marketing and merchandising. 5. Know the various documents used for export, terms of payment and export incentives, the functions & objectives of IMF, WTO, GATT, MFA and concepts of exchange control regulations.

Apparel Marketing

Apparel Marketing - definition, responsibilities of a marketing division, marketing objectives and strategic Marketing research – types of marketing research; Retails and wholesale marketing strategies; Domestic international markets; Advertising - types of advertising, different media in apparel marketing; Brand loyalty identity: Labelling and licensing. [9]

Apparel Merchandising

Merchandising - definition, types of merchandising, functions of merchandising division-importance of lead time and implications of lead time, role and responsibilities of a merchandiser, quality of a merchandiser; Types of buyers ; Visual merchandising – definition, objectives, purpose of visual merchandising. [9]

Time Management In Merchandising

Production scheduling – route card format, time and action calendar: Process follow up – yarn, knitting, processing, sewing & labels; Practical check points; Computer applications in marketing and merchandising. [9]

Pricing and Sourcing

Pricing theory – factors affecting price structure in apparels, mark up and mark down.
Sourcing: Definition, need for sourcing, method of sourcing; Sourcing of accessories – linings, buttons, zippers, labels, etc.; Manufacturing resources planning (MRP); JIT – philosophy; Lean manufacturing - concepts and its application in garment industry. [9]

Documentation and Incentives

Various types of export documents – Pre-shipment & post-shipment documentation; Terms of payment; Export incentives – Advance authorization scheme, DFIA, Duty drawback scheme, RoSCTL, EPCG scheme; DEPB scheme; I/E license; Exchange control regulation; Export risk management; ECGC schemes; Export finance; IMF / WTO / GATT / MFA – functions, objectives, success & failures. [9]

Total Hours: 45

Text Book(s):

1.	Patric Nassif ,“The art of Visual Merchandising; Advanced visual merchandising book” Kindle Edition, 2017.
2.	Gopalakrishnan N., “Simplified Lean Manufacture: Elements, Rules, Tools and Implementation”, Prentice Hall India 2013.

Reference(s) :

1.	Gilbert, “ Retail Marketing Management” Pearson India, 2014
2.	Sarah Bailey and Jonathan Baker, “Visual Merchandising for Fashion” . 2019.
3.	Jan seal, “Textile and wearing apparel Documentation and Procedures” Paperback publisher, 2011.
4.	Jeremy A.Rosenau, David L Wilson, " Apparel Merchandising-The line starts here ’ 2006.

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50 TT E 25 - Apparel Marketing and Merchandising														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3		3	2					3	2			2	2	
CO2	3					3			3	2			2	3	
CO3	3	3	3	2							2		2	3	
CO4	3	3	2	2	3						2		2	3	
CO5	3										3		2	3	

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K.S. Rangasamy College of Technology - Autonomous								R 2018
50 TT E 31 - Textile Mechanics								
B.Tech. Textile Technology								
Elective	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
III	3	0	0	45	3	50	50	100

Objective(s)	• To impart knowledge on the concepts of Gears, Motions, Friction, Energy and Moments. The students will be familiar with Design and Construction of cams, Design of transmission of shafts and machine components balancing. • To apply mechanics for design of Textile Mechanisms • To understand the principles of mechanics as applied to Textile Machinery • To impart knowledge on differential gearing in Textile Machinery • To understand the balancing of machine components.
Course Outcomes	**At the end of the course, the students will be able to** 1. Define the importance of gear and belt drives and to express the relationship between tensions in belt drives and also the condition for maximum power transmission, Design the profiles of plain and twill tappets and ring frame builder motion cams 2. Explain the concepts of displacement, velocity and acceleration and determine the same in textiles and calculate force, work done and power in textile machinery. 3. Discuss the laws of friction and determine frictional force involved in textile, apply the principle of moment and calculate forces and couples in textiles. 4. Express the stress- strain, bending shear and torsion characteristics of materials and design transmission shafts and drafting rollers 5. Analyze the concept of balancing of rotating objects, Balance rotor and card cylinder

Note: The hours given against each topic are of indicative. The faculty have the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Drives and Design of Cam and Tappets

Belts and Ropes- Drive Speed Ratio – Centrifugal tension - Condition for maximum power transmission and speed – PIV drives. Gears Nomenclature - Velocity ratio-Speed calculations - Epicyclic gear trains.
Cam and Tappets: Design of Ring frame builder motion cam; Plain and Twill cams for tappet looms. [9]

Equation of Motion and Friction

Simple harmonic motion; Fundamental equation of motion- force, mass, momentum, work done, power; Shuttle and ring frame traveller velocity and power consumption.
Friction: Static, dynamic and coil friction; Frictional force and power; Application in textiles - negative let off, tension devices.Differential gearing in speed frame. [9]

Energy and Moments

Kinetic and potential energy calculation in the textile application; Principles of moments- scutcher calendar roller, ring frame top arm loading; Centre of gravity; Sley displacement, velocity, acceleration, and sley eccentricity in relation with crank radius and connecting arm length. [9]

Design of Transmission of Shafts and Drafting Rollers

Material Properties; Safety consideration in design; Stress-strain relationships of materials; Tensile, compressive, shear, bending and torsion; Design of transmission shaft; Static load, torsional rigidity and lateral rigidity; Design of drafting rollers; Torsional rigidity and lateral rigidity. [9]

Balancing of Machine Components

Balancing of machinery-concepts and definitions; Theoretical considerations in balancing; Balancing of rotors; Balancing of card cylinder; Practical aspects of balancing; Measurement of balance. [9]

Total Hours: 45

Text book(s):

1. V. Jayakumar, “Kinetimatics of Machinery”, Lakshmi publications 2006.
2. R.S. Rengasamy “Mechanics of Machines”, NCUTE Publications, Ministry of Textiles, New Delhi, 2002.

Reference(s) :

1. Ganapathy Nagarajan, “Textile Mechanisms in spinning and weaving machines”, Wood head Publishing, India, 2014.
2. Booth J E “Textile Mathematics, Vol. I, II & III” Textile Institute, Manchester, UK, 1977.
3. Slater K. “Textile Mechanics, Vol. I & II” Textile Institute, Manchester, UK, 1997.
4. W.A. Henton, “Mechanics for Textile students”, Textile Institute, Manchester, UK, 1960.

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50 TT E 31 – Textile Mechanics															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	1				1			2	1	1	1		
CO2	3	2	1		1		1			2	1	1	1		
CO3	3	2	2	1	1	1	1			3	1	1	1	1	
CO4	3	3	2	1	2	1	2	1	1	3	2	1	1	1	1
CO5	3	3	2	1	2	1	2	1	1	3	2	1	1	1	1

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K.S.Rangasamy College of Technology - Autonomous								R 2018
50 TT E 32 - Smart Textiles								
B.Tech. Textile Technology								
Elective	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
III	3	0	0	45	3	50	50	100

Objective(s)	• To provide an overview about the smart technology, material selection, design and manufacturing system. • To taught the heat storage and thermo regulating properties of textiles. • To give an overview on of Thermal insulated textiles and educate on the various functional finishes involved in Thermal insulated textiles production. • To inculcated the scope, construction and functions of wearable technologies. • To enlighten the Bio processing and Tissue engineering applications for smart textiles and clothing.
Course Outcomes	**At the end of the course, the students will be able to** 1. Select the material and design requirements for manufacturing smart textiles product. 2. Classify the various types of hazards and contour the Surface treatments required for protective textiles. 3. Discern the functions of thermally sensitive material. 4. Figure out the construction and application of wearable technologies. 5. Apply the Bio processing and Tissue engineering applications in smart textiles production.

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Introduction to Smart Textile [9]

Introduction – Definition & Scope of smart textile. Smart fibers – Properties and Application. Development of smart textiles and smart garments - smart textiles building. Current & future challenges for Smart textiles.

Heat Storage and Thermo Regulated Textiles and Clothing [9]

Introduction – Basics of heat storage materials – Manufacture of heat storage and thermo regulated material: Phase change materials or impregnated fibres, coated fabric, fibre spinning - properties of heat storage and thermo regulated textiles & clothing: Thermal resistance, thermo regulating properties, antimicrobial properties – Applications of heat storage and thermo regulated textiles and clothing.

Thermally Sensitive Material [9]

Introduction – Thermal storage and thermal insulating fibers: Use of ceramics as melt dope additives, Hollow fibres, Insulating structures with PCM – Thermal insulation through polymeric coating: Water proof breathable coatings, Water proof breathable membranes-Designing of fabric assemblies.

Wearable Technologies [9]

Introduction – Basics of embroidery technology-Embroidery for technical applications: Tailored fibre placement, medical textiles. Introduction-ARTS- The symbiotic relationship between textiles and computing-Wearable motherboard: performance requirements, design and structure, Production system and its potential applications. Introduction: Wearable technology- performance requirements-prototype: user interface, survival features in the suit, Wearable technology for snow clothing.

Smart Interactive garments [9]

Smart interactive garments for combat training, hospital and patient care; smart garments in sports and fitness activities; smart garments for children; smart home textiles

Total Hours : 45

Text book(s):

1. Smart Textiles & their applications, 2016 Edited by Vladan Koncar, The Textile Institute & Woodhead Publishing, UK. ISBN 978-0-08-100574-3.
2. Smart Textiles - Fundamentals. Designs and Interactions, 2017 Edited by Steven Schneegaas & Oliver Amft, Springer Publishing, Germany. ISBN 978-3-319-50123-9.

Reference(s):

1. Smart Textiles for protection,2013 Edited by R.A.Chapman, The Textile Institute & Woodhead Publishing, UK. ISBN 978-0-85709-056-0.
2. Smart Clothes and Wearable Technologies, 2010 Edited by J.Mccann & D.Bryson, The Textile Institute & Woodhead Publishing, UK. ISBN 978-184569-357-2.
3. Electronic Textiles, 2015 Edited by Tilak Dias, The Textile Institute & Woodhead Publishing, UK. ISBN 978-0-08-100201-8
4. Xiaoming Tao, “Smart fibers, fabrics and clothing”, Wood head publication, Textile Institute, 2003 publication.

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50 TT E 32 - Smart Textiles															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2		3	3	2	2	2			2		2	2		
CO2	2		3	3	2	2	2			2		2	2		
CO3	2		3	3	2	2	2			2	2	3	2	2	
CO4	2		3	3	3	2	2			2	2	3	2	2	
CO5	2		3	3	3	2	2			2	2	3	2	2	

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K.S. Rangasamy College of Technology–Autonomous								R2018
50 TT E 33 – Sustainable Textiles								
B.Tech. Textile Technology								
Elective	Hours / Week			Total Hrs.	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
III	3	0	0	45	3	50	50	100
Objective(s)	• To get knowledge on Sustainable process • To aware the supply chain of textiles • To analyze the ecological parameters in textile industry • To understand the reasons of carbon footprint and its causes • To identify the sustainable fashion trends							
Course Outcomes	**At the end of the course the students will be able to** 1. Apply the concepts of sustainability in the textile sector 2. Describe the life cycle assessment of textiles 3. Analyze the carbon foot print and its impact on environment 4. Evaluate the life cycle impacts, modeling of life cycle impacts 5. Apply the standards of environmental footprints of various packaging systems							

Note: The hours given against each topic are of indicative. The faculty have the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Sustainable Development (SD) as a Goal in Production, Marketing and Trade

Concept, Theory behind, Sustainability in public sector and in industry, Environmental management systems, Environmental labeling [9]

Supply Chain of Textiles

Fibres, Yarn and Fabric production, Garment manufacturing, Chemical treatment, Consumption, use and care, Disposal, reuse and recycling scenarios, Energy [9]

Life Cycle Assessment (LCA) and Ecological Key Figures (EKF)

Life cycle assessment (LCA) methodology, Eight case studies, Life cycle inventory (LCI), Life cycle assessment (LCA), Costs, Ecological key figures (EKF), Applied ecological key figures (EKF) in spinning and weaving, Discussion on ecological key figures (EKF) of textile products. [9]

Carbon Footprint of Textile and Clothing Products

Environmental Impacts of Apparel Production, Distribution, and Consumption, Eco-Parameters and Testing of Sustainable Textiles and Apparels, Sustainable Measures Taken by Industry Affiliates, Nonprofit Organizations and Governmental and Educational Institutions, Standards: Oeko-Tex Standard 100, ISO 22000, and ISO 31000, E3096 – 18, E2986 – 18, E2987 / E2987M – 20. [9]

Sustainable Fashion

The fashion industry, sustainability and business models. With these 3 concepts, decode the past, present and future of sustainable fashion. Broad theoretical framework for sustainable business models and the differences between these models and traditional business models. [9]

Total Hours: 45

Text Book(s):

1. Subramanian Senthilkannan Muthu., "Sustainability in the Textile Industry", Springer, Singapore, 2017, ISBN:978-981-10-2638-6.
2. Subramanian Senthilkannan., "Roadmap to Sustainable Textiles and Clothing", Springer, Singapore. 2014, ISBN: 978-981-287-065-0.

Reference(s):

1. Subramanian Senthilkannan., "Sustainable Innovations in Textile Fibre", Springer, Singapore, 2018, ISBN:978-981-10-8578-9.
2. Subramanian Senthilkannan., "Sustainable Innovations in Textile Chemical Processing", Springer, Singapore, 2018, ISBN: 978-981-10-8491-1.
3. Subramanian Senthilkannan Muthu., and Yi Li., "Assessment of Environmental Impact by Grocery Shopping Bags, Springer Science & Business Media, 2013, ISBN: 978-981-4560-20-7.
4. Subramanian Senthilkannan Muthu., "Environmental Footprints of Packaging", Springer, Singapore, 2015, ISBN: 978-981-287-913-4.

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50 TT E 33 - Sustainable Textiles														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	3	1	2	2	3	2	2	2	2	2	3	2	2
CO2	3	2	1		2				3	2	3	3	3	2	2
CO3	2	1		2	2	1		2	3	2	2	3	2	3	2
CO4	2	3	2	1	2	2	3	2	2	2	2	2	2	2	2
CO5	3	2		2	2	3	2	2	2	2	2	3	2	2	2

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K.S. Rangasamy College of Technology–Autonomous								R2018
50 TT E34 - Production and Operations Management								
B.Tech. Textile Technology								
Elective	Hours / Week			Total Hrs.	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
III	3	0	0	45	3	50	50	100

Objective(s)	• To impart the knowledge on various aspects of various production systems • To impart the knowledge on various aspects of different types of layouts • To impart the knowledge on various aspects of Aggregate production planning • To impart the knowledge on various aspects of Material management, inventory models • To impart the knowledge on various aspects of Total Productive Maintenance etc.,
Course Outcomes	**At the end of the course, the students will be able to** 1. Explain the various production systems, forecast the production and operation management 2. Practice the capacity planning and use different layouts 3. Discuss aggregate production planning and Schedule the operation management 4. Manage the material management and plan the material requirement 5. Apply automated technology in maintenance and Evaluate the performance of computers in maintenance

Note: The hours given against each topic are of indicative. The faculty have the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Production Systems [9]

Factors of production; environmental and social concerns of operations; design of production system; forecasting in production and operation management – various qualitative and quantitative techniques

Capacity Planning [9]

Capacity planning – single stage system, multistage system; facility planning – objectives; different types of layouts, developing process layout, product layout; job design techniques

Operation Management [9]

Aggregate production planning – procedure, importance; scheduling in operation management – mass production system, batch and job shop, recent trends in operations management; measuring performance In operations

Material Management [9]

Material management – material planning, purchase, stores, material handling and disposal; inventory models – basic inventory model, gradual replacement model, basic model with backlogging, bulk discount model, independent demand system for multiple products, models with uncertain demand, multiple period model; MRP-objectives, elements of MRP, MRP computation, implementation

Maintenance Management [9]

Concepts - Total Productive Maintenance, Autonomous Maintenance, Just In Time, Automated Technology, Hard Technology, Soft Technology, Hybrid Technology, CIM, CAD, GT, CAM, CAPP, robotic FMS; application of MIS in production and operations management.

Total Hours: 45

Text Book(s):

1.	Buffa E.S. and Sarin R.K., “Modern Production / Operations Management”, John Wiley & Sons. Inc., 1994.
2.	Taha H.A., “Operations Research: An Introduction”, Prentice Hall of India, New Delhi, 1997.

Reference(s):

1.	Adam Jr. E.E. and Elber R.J., “Production and Operations Management”, Prentice Hall of India, New Delhi, 1997.
2.	Chary S.N., “Production and Operations Management”, Tata McGraw-Hill, New Delhi, 1988.
3.	Narasimhan S.L., Mcleavy, D.W. and Billington P.J., “Production Planning and Inventory Control”, Prentice Hall of India, New Delhi, 1997.
4.	Grant Ireson., “Factory Planning & Plant Layout”, Prentice Hall, New Jersey, 1952.

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50 TT E 44 - Production and Operations Management															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2	1	2	3	2		3	2	2	2	3	2	2
CO2	2	2	2	2	2				2	3	2		3	2	2
CO3	2	3				2		2	3	3	2		3	2	2
CO4	3	2		2	2	2		2	3	2	2	2	2	2	2
CO5	2	3	3	2	3	2			2	2	3	2	2	2	2

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K.S. Rangasamy College of Technology - Autonomous								R 2018
50 TT E 35 - Export Policies and Documentation								
B.Tech Textile Technology								
Elective	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
III	3	0	0	45	3	50	50	100

Course Objective(s)	• To impart the knowledge of various aspects of export trade, export finance and foreign exchange market • To impart the knowledge product planning and development ,product cycle, market . • To impart the knowledge of EXIM policies, export documents and export procedures • Analyse the export promotion activities undertaken by the government. • Analyse the pricing policies and pricing terms in export trade.
Course Outcomes	**At the end of the course, the students will be able to** 1. Differentiate domestic and international trade, merits and demerits & functions of Regional Trade Blocs and summarize the international business environment, regulatory framework and export barriers. 2. Analyze the different types of export credit facilities available for exporters and describe the export risk coverage facilities 3. Summarise the concept of balance of payment and its functions and factors affecting counter trade and foreign exchange functions 4. Outline the export promotion activities undertaken by the government, summarise the foreign trade regulation act for regulating export trade 5. Discuss the steps involved in export activity from raw material to shipping and the documents to be produced in bank for payment clearance and documents to be produced in central excise department for claiming incentives.

Note: The hours given against each topic are of indicative. The faculty have the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Introduction to International Business

Domestic trade Vs international trade - comparison; regional trade blocks – ASEAN, EU, SAARC, NAFTA; International business environment – social, cultural, political and regulatory; Tariff and Non Tariff barriers – features. [9]

International Trade Financing

Export credit - L/C, export packing credit, post shipment credit, Buyers credit, Line of credit, short term, medium term, long term finance; Telegraphic Transfer, EXIM bank – objectives and functions; ECGC – objectives and functions; Forfaiting – functions and benefits; Product planning and development, product cycle, new product development ; Payment and Pricing Terms in export trade. [9]

Balance of Payment

BOP – Introduction, components, functions, disequilibrium, financing BOP deficit; foreign exchange market
market – functions, dealings, exchange rate systems; Devaluation – introduction, limitations; Counter trade – meaning, factors responsible for growth of counter trade. [9]

Exim Policies

Foreign Trade Policy- objectives, EXIM policy related to textile; Export promotional measures – ASIDE, MAI, MDA, TEE, BPQ, TPS, DBK, EPCG, EOU, EHTP, STP, BTP, SEZ; Regulation and promotion of foreign trade – Introduction. [9]

Export Documents

Documents for export – principal and secondary, documents for claiming export assistance; international codes for products and services; export procedure – from packing to shipment. [9]

Total Hours: 45

Text book(s)

1. T.A.S Balagopal, " Export Management ", New age Publishers,2008
2. Francis Cherunilam, "International Buisness Text and Cases", Prentice Hall India, 2009

Reference(s) :

1. Richard M.Hill, Ralph S.Alexander, James S.Cross, "Industrial Marketing", Aitbs Publishers & Distributors, 1998
2. Jeannette Jamow, Kitty G.Dickerson, "Inside the Fashion Business", Prentice Hall, 1997
3. Philip Kortler and Kevin Lane keller , "Marketing Management", PH ,2012.
4. Ramaswamy V S and Namakumari S., "Marketing Management", Global Perspective Indian Context,Macmillian Publishers India Ltd ,2009

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50 TT E 35 – Export Policies and Documentation															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	1										3	1	
CO2	2	2	1			2					2		3	1	
CO3	3	2	2			2					3		3	1	
CO4	3	2	2			2					3		3	1	
CO5	2	2	2			2					2		3	1	

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K.S. Rangasamy College of Technology–Autonomous								R2018
50 TT E 41 – Clothing Science								
B.Tech. Textile Technology								
Elective	Hours / Week			Total hrs.	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	2	0	2	45	3	50	50	100

Objective(s)	• To study the basic understanding of comfort aspects of textile materials. • To acquire knowledge on use of fabrics for specialty applications. • To understand the multidisciplinary nature of the subject, • To encompassing various concepts of physics & psychological science • To design and development and material characterization with scientific approaches.
Course Outcomes	**At the end of the course the students will be able to** 1.Aware of the concepts of clothing science 2.Apply the theory of psychological factor in apparel manufacturing 3.Describe the procedure involved in testing of fabrics with respect to comfort 4.Analysis the comfort characteristics of various fabrics 5.Correlate the property of the fabric with comfort to the wearer

Note: The hours given against each topic are of indicative. The faculty have the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Introduction to Comfort and Science

Comfort – types and definition; human clothing system; Psychology and comfort – perception of comfort, psychological research techniques, comfort sensory descriptors, psychophysics, scales of measurement, scales to measure direct responses, wear trial technique, comfort perception and preferences [9]

Psychological Science

Psychological comfort; neuro-physiological comfort-basis of sensory perceptions; measurement techniques-mechanical stimuli and thermal stimuli [9]

Thermo-Physiological Science

Thermo physiological comfort–thermoregulatory mechanisms of the human body, role of clothing on thermal regulations [9]

Heat and Moisture Transport

Heat and moisture transfer–moisture exchange, wearer's temperature regulations, effect of physical properties of fibres, behavior of different types of fabrics [9]

Testing of Fabrics

Fabric tactile and mechanical properties-fabric prickliness, tactile, thermal comfort characteristics, itchiness, stiffness, softness, smoothness, roughness, and scratchiness; predictability of clothing comfort performance. [9]

Practical

Total Hours: 45

Text Book(s):

1.	Li Y., "The Science of Clothing Comfort", Textile Progress 31:1-2, Taylor and Francis, UK,2001, ISBN: 1870372247 | ISBN-13: 9781870372244
2.	Apurba Das., and Alagirusamy R., "Science in clothing comfort", Wood head Publishing India Pvt. Ltd., India, 2010, ISBN: 1845697898 | ISBN-13: 9781845697891

Reference(s):

1.	Hassan M. Behery., "Effect of Mechanical and Physical Properties on Fabric Hand", Woodhead Publishing Ltd.,2005, ISBN: 1855739186 | ISBN-13: 9781855739185
2.	Ukponmwan J.O., "The Thermal-insulation Properties of Fabrics", Textile Progress 24:4, 1-54,Taylor and Francis, UK, 1993, ISBN: 1870812654 | ISBN-13: 9781870812658
3.	Guowen Song., "Improving comfort in clothing", Wood head Publishing Ltd., UK, 2011, ISBN:1845695399 | ISBN-13: 9781845695392
4.	Laing R.M., and Sleivert G.G., "Clothing, Textile and Human Performance" Textile Progress32:2, The Textile Institute, 2002, ISBN: 1870372514 | ISBN-13: 9781870372510

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50 TT E41 – Clothing Science															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	3		2				2	2			3		
CO2	3	2	3						2	2			3		
CO3	3	2	3		2				2	2	1		3	2	
CO4	3	2	3						2	2			3	1	
CO5	3	2	3	1					2	2			3		

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K.S.Rangasamy College of Technology - Autonomous								R 2018
50 TT E42 - Apparel Production Planning and Control								
B. Tech. Textile Technology								
Elective	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	2	0	2	45	3	50	50	100

Objective(s)	• To know about apparel production parameters. • To understand about marker and lay planning. • To know about garment operation sequence and development. • To know about balance of production. • To know about quality control in product development.
Course Outcomes	**At the end of the course, the students will be able to** 1. Explain the apparel production parameters and analyze the time table concept, product data management and specification sheet. 2. Execute the skills on marker planning, marker making and spreading techniques and lay lot planning. 3. Analyze the garment operation breakdown with machine and explain production flowchart for various garments. 4. Estimate the Capacity for various garment process and explain line balancing and estimate on utilizing the man power and machines. Computer integrated in production planning. 5. Describe the quality assurance during product development, methods to avoid problems during pattern making, garment construction and methods to control time and cost.

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Introduction [9]

Apparel production parameters - planning and lead-time; Product development steps from prototype to production model; Importance of pre-production activities; Introduction to timetable concepts; Product data management; Understanding and interpretation of specification sheet.

Marker and Lay Planning [9]

Marker planning - plain, stripe, plaid, check, directional and non directional; Marker making; Spreading techniques - one way, two way, biased and cross grain; Laying-types, splicing, limitation of lay: Numerical exercises on lay lot planning.

Operation Sequence Development [9]

Garment operation breakdown with machine and attachment details; Development of production grid for T- Shirts; Development of production flowchart - men's full sleeve shirt, trousers, five-pocket jeans, shorts and T-shirt.

Balance of Production [9]

Capacity calculation - cutting, sewing and finishing; Determination of machine requirements for new factory; Line balancing - determination and allocation of manpower and machine for balanced production in existing plant for a given target. Introduction to computer integrated production planning systems.

Quality Control [9]

Quality assurance during product development-methods to avoid problems during pattern making, garment construction and other areas; Inspection procedures; Work-study in garment industry – methods to control time and cost.

Practical

Total Hours : 45

Text book(s):

1. Steven Nahmias, "Production and Operations Analysis", 6 edition; Tata McGraw-Hill, 2009
2. S. K. Mukhopadhyay, "Production Planning & Control: Text and Cases", PHI Learning Pvt. Ltd., 2007

Reference(s) :

1. Stephen N. Chapman, "The fundamentals of Production Planning and Control.", Pearson Education, 2009
2. Upendra Kachru, "Production and operations management Text and cases" Excel books 1st edition 2007.
3. Martand Telsang, "Industrial Engineering and Production Management", S. Chand and Company, 1st edition, 2000
4. Jacob Solinger, "Apparel Production Handbook", Bobbin Media corporation, USA 1988.

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50 TT E 42 - Apparel Production Planning and Control															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2								3	3		3	3	
CO2	3	2	2							2			3	3	
CO3	3	3	2	2						2			3	3	
CO4	3	3	2	2						2	2		3	3	
CO5	3	2								2	2		3	3	

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K.S. Rangasamy College of Technology - Autonomous								R 2018
50 TT E 43 - Industrial Engineering In Textile and Clothing Industry								
B.Tech Textile Technology								
Elective	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	2	0	2	45	3	50	50	100

Objective(s)	• To study about the concept of industrial engineering • To understand the procedure of Method study and various types of charts • To study about work measurements and calculate the standard time • Understand plant layout and line balancing techniques • Describe work environment and material handling techniques
Course Outcomes	**At the end of the course, the students will be able to** 1. Summarize the basic concepts of industrial engineering , productivity and work content 2. Demonstrate the procedure for conducting method study using different charts and diagrams 3. Outline the concepts of motion economy and Calculate standard time for various operations 4. Discuss the concept of layout and Solve line balancing problems 5. Express the requirement of work environment and types of material handling equipments

Note: The hours given against each topic are of indicative. The faculty have the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Concepts of Industrial Engineering and Productivity

Industrial Engineering - definition and scope, Role of industrial engineers, Tools, techniques and benefits of industrial engineering ; Productivity – definition, different Productivity indices, factors influencing productivity, productivity linked with Standard of living; Work content - basic and added work content, Reduction of work content and ineffective time; Low productivity in textile and apparel industries - reasons and suggestions for improving productivity. [9]

Work Study and Method Study

Work study – definition and purpose, Basic Procedure of work study; Method study – definition and purpose, Method analysis charts, symbols and diagrams; Charts indicating process sequence – outline process chart, Flow process chart (man type , material type and equipment type); Charts using time scale - multiple activity charts; Diagrams indicating movement – flow diagram, string diagram and travel chart. [9]

Motion Study and Work Measurement

Motion study – Principles of Motion economy, classification of movements, Two handed process chart; Micro motion study – chart, SIMO chart; Work measurement– definition and purpose, Techniques of time study – stop watch method; Predetermined Motion Time Standards (PMTS)-definition, concepts, merits and demerits: Rating factor – Definition and types; Allowances – definition and types; Standard time – definition and method for calculating SAM**.** [9]

Product Layout

Lay out – definition and types of garment lay out with examples, methods for determining space requirement and steps for developing a new layout; Application of IE techniques – capacity study calculation, measurement of operator performance, WIP; Operation Bulletin – objectives and examples. [9]

Work Environment and Material Handling

Work environment – factors influencing working environment, lighting, ventilation, temperature control, humidity control and noise control; Ergonomics; Services – stores, health and convenience related service; Material handling – objectives, classification of material handling equipments, characteristics of material handling equipments related to textile and apparel industry. [9]

Practical

Total Hours: 45

Text book(s)

1.	ILO, Geneva, “Introduction of Work Study”, Universal Publishing Corporation, Mumbai, 2006.
2.	Ramesh Babu V, “Industrial Engineering in Apparel Production”, Woodhead Publications India Pvt Ltd, New Delhi, 2012.

Reference(s) :

1.	KiellB.Zandin, “Maynard’s “Industrial Engineering Hand Book”, McGraw Hill, Inc., New York, 2001.
2.	James M Apple, “Plant Layout and Materials Handling”, John Wiley & Sons, 1997.
3.	Rajesh Bheda, “Managing Productivity of Apparel Industry” CBS Publishers and distributors, New Delhi 2002.
4.	“Industrial engineering manual for textile industry”, Wiley Eastern (p) Ltd., New Delhi, 1988.

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50 TT E 43 – Industrial Engineering in Textile and Clothing Industry															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	2	2	1	2	1		1	1	2	1	2	1	1	1
CO2	3	2	3	2	3	3	1	2	3	3	3	3	2	2	1
CO3	3	3	3	3	3	3	1	2	3	3	3	3	3	2	1
CO4	2	2	2	2	2	2	1	1	2	2	2	2	3	2	1
CO5	3	2	1	3	2	3	1	3	2	2	3	3	2	1	1

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Rev. No. 3 / w.e.f. 18/01/2023, Passed in BoS Meeting held on 22/12/2022,
Approved in Academic Council Meeting held on 07/01/2023.

K.S. Rangasamy College of Technology–Autonomous								R2018
50 TT E 44 - Apparel Processing and Clothing Care								
B.Tech. Textile Technology								
Elective	Hours / Week			Total Hrs.	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	2	0	2	45	3	50	50	100

Objective(s)	• To impart the knowledge of apparel processing. • To impart the knowledge of apparel quality control. • To impart the knowledge of apparel dyeing and printing machines. • To impart the knowledge of apparel finishing and stain removal. • To impart the knowledge of Care Labels, Laundering & Dry Cleaning
Course Outcomes	**At the end of the course, the students will be able to** 1. Explain apparel pre-treatment processing and factors influencing creases and chafe marks. 2. Describe the various quality controls in garment accessories and stitching. 3. Analyze the various apparel dyeing and printing machines working principles and applications. 4. Explain the various apparel finishing methods, classification of stains and stain removers. 5. Describe about system of care labels, laundering procedures and Dry cleaning operations and its materials.

Note: The hours given against each topic are of indicative. The faculty have the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Apparel Processing [9]

Apparel Processing: Introduction, Pre-treatment of cotton apparels, desizing, scouring, bleaching and optical brightening. Combined pre-treatment and dyeing methods. Special requirements of the chemicals used. Factors influencing creases and chafe marks. Corrosion protection agents for dye liquors.

Quality Control In Apparel Processing [9]

Introduction: Seams, Elasticated areas, Waist bands and cuffs. Shrink behaviour. Accessories. Sewing thread, Selection of fibre type for the thread, Thread selection and precautions in stitching. Foreign substances. Interlining and care labeling.

Apparel Dyeing Machines & Apparel Printing [9]

Apparel Dyeing Machines: Types. Working of Paddle, Drum dyeing, Washing, centrifuging, Drum dyeing centrifuging, Jet circulation dyeing and Hydrodynamic circulation machines.
Apparel Printing: Flock printing, Foam printing. Transfer printing, Precautions, Driers and Steamers

Apparel Finishing & Stain Removal [9]

Apparel Finishing: Mechanical finishing, topper, pressing dummy and ironing. Chemical finishing, stone, enzyme, softening, soil release and wrinkle resistant finishes. Washing and finishing of denim apparels. Stain Removal: Classification of stains, Identification of the stain, Classification of stain removers. Principles of stain removal. Stain removal procedures. Application of stain removers.

Care Labels, Laundering & Dry Cleaning [9]

Care Labels: Systems of care labeling, American, Japanese, Canadian and European Washing, Bleaching, Drying, Ironing and Dry cleaning instructions. Placement of labels on apparels. Laundering: Home laundering procedures for Cotton, Linen, Wool, Silk and Synthetic fabrics. Dry Cleaning: Introduction, Dry cleaning operations and materials

Practical

Total Hours : 45

Text Book(s):

1. Subramanian Senthilkannan Muthu, “Circular Economy in Textiles and Apparel: Processing, Manufacturing, and Design” Woodhead Publishing, ISBN-13-978-0081026304. November 2018.
2. Richard Blackburn, “Sustainable Apparel: Production, Processing and Recycling” Woodhead Publishing, ISBN-13-978-1782423393, August 2015.

Reference(s):

1. Kamal Khurana, “Garment Dyeing” Sonali publishing, ISBN-13-978-8184116076, January 2012.
2. Pat Armstrong “Wash, Wear, and Care: Clothing and Laundry in Long-Term Residential Care” Publisher McGill-Queen's University Press, April 2017.
3. Goldman.R.F., and Lyle D.S, "Performance of Textiles" John Wiley and Sons, New York, 1997
4. Bernard P Corbman, “Textiles: Fibre to Fabric,” McGraw Hill Book Co., Singapore, 1983. ISBN:0070131376

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50 TT E44 – Apparel Processing and Clothing Care															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3			2			2			3			3		
CO2	3			2			2			3		2	2		3
CO3	2	2		2			-			2		1	2		1
CO4	2	2		2			1			2			1		
CO5	2	2		2			2			1			1		1

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K.S. Rangasamy College of Technology - Autonomous								R 2018
50 TT E 45 - Apparel Production Machinery and Equipment								
B.Tech. Textile Technology								
Elective	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	2	0	2	45	3	50	50	100

Course Objective(s)	• To impart the various aspects of spreading and cutting machines and functions of the sewing machines. • To Select work aid attachments and expertise in computer controlled sewing machine. • To acquire knowledge on the design and operational features of garment production machinery and equipment. • To understand the various garment folding, computer controlled sewing machines. • To know the details of garment machinery and equipment with focus on the means of exploiting the features built in the garment machinery and equipment.
Course Outcomes	**At the end of the course, the students will be able to** 1. State the types and functions of spreading and cutting machines and classification of the common cutting and spreading defects. 2. Explain the various parts of sewing machines and describe the stitch length control and time sequence of stitch formation 3. State the classification of sewing machine according to bed types, discuss the types of belt drives and the functions of over lock and flat lock. 4. Explain the types of belt drives and the functions of over lock and flat lock, various work aid attachments of sewing machines 5. Express the sewing machine safety, care and maintenance and categorize the various special machines.

Spreading and Cutting machines

Types and functions of fabric spreading machines; types and functions of cutting machines – straight knife, round knife, band knife, die cutting, computerized cutting, laser cutting and other modern techniques; types of blades for different cutting machines; common defects in cutting and their remedies. [9]

Parts and Functions of Sewing machines

Parts and functions of sewing machines: needles, bobbin, bobbin cases, shuttle, shuttle hook, loops, loop spreader, threading fingers, throat fingers, throat plate, take up lever; tension discs, tension guides, feed dog, pressure foot; stitch length control; belt tension; timing sequence of stitch formation. [9]

Sewing machine mechanism

Sewing machineries: classification according to bed types; classification based on stitch types (hook and looper); driving mechanism of SNLS and double needle lockstitch machine; types of belt drives; threading diagram for overlock and flat lock machines - various parts and their functions; positioning the moving knife, installation, sharpening ,replacing moving knives, common problems and their remedies. [9]

Work Aids and Special attachments

Work aids attachments: roller guides, edge guides, hemmers, folders, compensating pressure foots left, right, feller, hammer, elastic attachment, placket making attachments, zipper attachments, pocket making attachments, sequins attachments; sewing machines safety regulations; care and maintenance of sewing machines. [9]

Special Purpose machines

Special machines: collar and cuff turning machines, bar tacking machine, button hole machine. button stitch machine, blind stitch machine; feed of the arm machine; fusing and pressing machines; garment folding machines; computer controlled sewing machines; metal detector machine; care and maintenance. [9]

Practical

Total Hours: 45

Text book(s):

1. Harold Carr & Barbara Latham, “The Technology of Clothing Manufacture”, Om Books International, New Delhi, 1994.
2. Gerry Cooklin, “Introduction to Clothing Manufacture” Blackwell Science Ltd., 1995.

Reference(s) :

1. Ruth E.Glock, Grace I.Kunz, “Apparel Manufacturing Sewn Product Analysis”, Blackwell Scientific Publications. (2004).
2. Claire Shaeffer, “Sewing for Apparel Industry”, 1st edition, Pearson’s Prentice Hall, New Jersey, USA, 2000.
3. Mary Mathews, Practical Clothing Construction Part-I. Designing, Drafting and tailoring Bhattarams Reprographics (P) Ltd., Chennai, 1991.
4. Mary Mathews, Practical Clothing Construction Part-II. Designing, Drafting and tailoring Bhattarams Reprographics (P) Ltd., Chennai, 1991.

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50 TT E45 – Apparel Production Machinery and Equipment															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2					1				2			3
CO2	1	2						1				2			2
CO3	3	3	3					1				2			3
CO4		2						1				2			2
CO5		2						1				2			2

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K.S. Rangasamy College of Technology – Autonomous								R 2018
50 TT E51 – Textile Industry and Mill Management								
B.Tech Textile Technology								
Elective	Hours / Week			Total Hrs.	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
V	3	0	0	45	3	50	50	100

Objective(s)	• To acquire knowledge on the scenario of the present textile industry • To encompass the production management techniques • To understand the functions of personnel management • To learn the concepts of financial management • To know the different management tools
Course Outcomes	**At the end of the course the students will be able to** 1. Explain the procedure for establishing a new textile unit 2. Discuss the application of ERP in textile industry 3. Describe regarding the human resource planning and grading 4. Analyze the profit and loss account and balance sheet 5. Appraise on the various management tools

Note: The hours given against each topic are of indicative. The faculty have the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Textile Industry

Indian Textile and clothing industry scenario, Procedure to set up a new textile / apparel unit, SWOT analysis of Indian Textile Industry, National Textile Policy, TN New Integrated Textile Policy, Promotional schemes for textile announced by the government. Service organizations - Role of EPC, TRA, CITI, ITTA, Textile Committee. Ministry of Textiles – Functions. [9]

Production Management

Spin plan, Weave plan, Garmenting Plan. Productivity analysis and its control in spinning and weaving. Production Possibility Curve, Operational chart, PERT, CPM, Inventory control, ERP: Application of ERP in Textile Industry-SAP. [9]

Personnel Management

Functions of Personnel Management & time office, Human Resource Planning, performance appraisal, Training and Development. Job description, Job classification and Job evaluation. Grading the employee: Rating system, Psychological test, Predictive Index-Myer Bridge Type Indicator. Basics of Labour Legislation. Wage structure and its components**.** [9]

Financial Management

Financial Management-concept, scope, functions, financial management cycle, sources of finance, Accounting-branches, functions, rules of accounting, accounting process-book keeping, journal posting, ledger, trial balance, trading account, profit and loss account and balance sheet. Accounting standard-Indian accounting standards & International accounting standards. Balance sheet, profit & loss account and financial ratio. [9]

Management Tools

Concept of Total quality Management, Quality circle, Quality Management System, Total Productive Maintenance, Kaizen. Management Information System, Supply Chain Management, Customer relationship management. Business Process Re-engineering. [9]

Total Hours: 45

Text Book(s):

1. Rattan JB," Modern Textile Management", Abhishek Publications, Chandigarh, 2017.
2. Naresh Grover, "Textile Mill Management: Theory and Practice", Random Publications, Delhi, 2016.

Reference(s):

1. Purushothama B,"Training and development of technical staff in the textile industry", Wood head publishing India Pvt Ltd, NewDelhi, 2012.
2. Francis Cherunulam,"International trade and export management", Himalaya publishing house, NewDelhi, 2019.
3. Ormerod.A., "Management of Textile Production", Buttorworth & Co Ltd, London, 1979.
4. Ormerod. A, "Textile Project Management", Textile Institute, 1992.

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50 TT E51 – Textile Industry and Mill Management														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2		2		2	2	2	2	2	1				2	
CO2	2	2	3	2	2		2		2			2		2	
CO3		2			2	2		2	2	2	2			2	
CO4	2	2	2		2	2		2		1	2			2	
CO5		2		2	2				1	1		2		2	

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K.S.Rangasamy College of Technology – Autonomous								R2018
50 TT E 52 -Textile and Apparel Entrepreneurship								
B.Tech. Textile Technology								
Elective	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
V	3	0	0	45	3	50	50	100

Objectives	**To impart basic knowledge on** • Awareoftheimportanceofentrepreneurshipopportunitiesavailableinthesocietyfor the entrepreneur. • Acquaint them with the challenges faced by the entrepreneur. • Comprehend the market survey and techno economic feasibility assessment. • Apprise them costing and break even analysis. • Mindful the Sickness in small industries, causes and consequences, corrective measures.
Course Outcomes	**At the end of the course, the students will be able to** 1. State the entrepreneurship concept, definition and characteristics and the types of entrepreneurship and entrepreneurial growth. 2. Categorize the types of small scale industries and the market survey and techno economic feasibility assessment. 3. Explain the sources of finance and financial assistance, costing and break even analysis. 4. Describe the sickness in small industries, causes and consequences, corrective measures and the various government policies for small scale enterprises and business incubators. 5. Comprehend the various electronic commerce, small enterprises and various leadership in the new economy and hiring the right employees.

Note: The hours given against each topic are of indicative. The faculty have the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Entrepreneurship [9]

Introduction of Entrepreneurship – Concept, definition, characteristics and functions. Types of Entrepreneurs– Difference between Entrepreneur and Entrepreneur, Entrepreneurship in Economic Growth, Factors Affecting Entrepreneurial Growth.

Small Scale Industries [9]

Small Scale Industries - Definition, Classification – Characteristics, Ownership Structures – Project Formulation – Steps involved in setting up a small industry – 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.

Finance Support and Financial Institutions [9]

Need – Sources of Finance, Term Loans, Capital Structure, Financial Institution, Management of working Capital, Costing, Break Even Analysis, Taxation – Income Tax, Excise Duty – Sales Tax.

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.

Export Documentation and Procedure for Small Enterprises [9]

Electronic commerce and small enterprises, Franchising, Leadership in the new Economy, Hiring the Right Employees, Building the Right Organizational culture and structure, the challenge of Motivating Workers.

Total Hours: 45

Text book(s):

1. Khanka. S.S., “Entrepreneurial Development” S.Chand & Co. Ltd., Ram Nagar, New Delhi, 2013.ISBN: 81 – 219 – 1801 – 4.
2. Donald F Kuratko, “Entrepreneurship – Theory, Process and Practice”, 9th Edition, Cengage Learning, 2014.ISBN: 9780357697962

Reference(s) :

1. Hisrich R D, Peters M P, “Entrepreneurship” 8th Edition, Tata McGraw-Hill, 2013, ISBN: 978 – 9339205386.
2. Mathew J Manimala, “Entrepreneurship theory at cross roads: paradigms and praxis” 2nd Edition Dream tech, 2005.*ISBN* : 8177224603.
3. Rajeev Roy, “Entrepreneurship” 2nd Edition, Oxford University Press, 2011. ISBN 10: 0198072635 / ISBN 13: 9780198072638.
4. Robert Mellor, “Entrepreneurship for Everyone: A Student Textbook”, SAGE Publications Ltd; First edition December 2008

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50 TT E 52 - Textile and Apparel Entrepreneurship														
	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	2	3	2
CO2	3	2		2		2		2	2	2	2	2	2	2	2
CO3	3	2			2			2	2	2	2	2	3	2	2
CO4	3	1	2	2		2		2	3	3	3	1	3	2	2
CO5	2	2	1	2	1		1	2	2	2	2	2	3	2	2

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K.S.Rangasamy College of Technology - Autonomous								R 2018
50 TT E 53 – Lean and Six Sigma concepts for Textiles and Apparel Industry								
B.Tech. Textile Technology								
Elective	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
V	3	0	0	45	3	50	50	100

Objective(s)	• To teach the concepts of Lean Manufacturing and six sigma. • To provide knowledge on the implementation procedure for lean six sigma. • To give an overview on various techniques of lean manufacturing. • To inculcate the concepts of inventory control. • To taught the implementation of lean techniques with various case studies.
Course Outcomes	**At the end of the course, the students will be able to** 1. Explain the concepts, features and elements of lean manufacturing and six sigma. 2. Summarize the evolution, principles and scope of lean six sigma. 3. List out the techniques, approaches and production process for lean manufacturing. 4. Discuss the concepts of Kanban, Kaizen, VSM and JIT in inventory control. 5. Categorize the concepts of 5S, TPM and Implementation of lean techniques.

Note: The hours given against each topic are of indicative. The faculty have the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Introduction to Lean Manufacturing and Six Sigma [9]

Introduction to Lean-Definition, Purpose, features of Lean; Need for Lean, Elements of Lean Manufacturing, Lean principles, the lean matrices. Definition of six sigma, origin of six sigma, six sigma concept, Critical Quality characteristics for six sigma.

Lean six sigma approach [9]

Definition, principles, scope and features of lean six sigma. The laws of lean six sigma, benefits of lean six sigma, Introduction to DMAIC tools.

Lean Production Preparation [9]

Lean production processes, approaches and techniques.—Importance of focusing upon flow, wastes, types of wastes, impact of wastes, waste elimination methodologies, Tools include - Workplace organization –Stability, Cellular systems, Quick change and set-up reduction methods,

Lean concepts in inventory control [9]

Practical Kaizen Training, Key factors in Practical Kaizen Training, Lean Culture, Standardization, Standards and abnormality Control, Definition, Principles of JIT, Continuous Flow, Kanban, Value Stream Mapping, Current State VSM and Future state VSM, Poke – Yake.

Implementation of Lean Techniques [9]

Visual Management, 5S, total productive maintenance, Small group activity, process flow diagram, establishing TAKT, ECRS. Implementation of lean six sigma in textile and apparel industries, Difficulties in implementation. Lean Implementation case study in Textile Industries.

Total Hours: 45

Text book(s):

1.	Dennis P Hobbs, “Lean Manufacturing Implementation”, Cengage learning India Pvt Ltd, New Delhi, 2004
2.	John Black, “Lean Production Implementing a World Class System”, Industrial Press Inc, New York, 2008

Reference(s):

1.	Michael L George: Lean Six Sigma, McGraw Hill Publication
2.	Askin G and Goldberg B, “Design and Analysis of Lean Production System”, John Wiley & Sons Inc, 2003.
3.	Bill Carrieva, “Lean Manufacturing That Works”, Prentice Hall of India Pvt Ltd, New Delhi, 2007.
4.	Gopalaksrishnan N , Simplified Lean Manufacture : Elements, Rules, Tools and Implementation, Prentice Hall of India Learning Pvt. Ltd., 2010

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50 TT E 53 - Lean and Six Sigma Concepts for Textile and Apparel Industry															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	1							2	2	2		2		2	1
CO2	1							2	2	2		2		2	1
CO3	2				2			2	2	2	2	2		3	1
CO4	2	2	2		3			2	2	2	2	2		3	1
CO5	2	2	2		3			2	2	2	2	2		3	1

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K.S.Rangasamy College of Technology - Autonomous **R 2018**

50 TT E 54 - Supply Chain Management for Textile and Apparel Industry

B.Tech. Textile Technology

Elective	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
V	3	0	0	45	3	50	50	100

Objective(s)	• To provide an insight on the fundamentals of supply chain networks, tools and techniques. • To study the supply chain management in apparel industry. • To know the e-business and global practices in supply chain systems. • To train the students to new and recent developments in supply chains and information technology • To study the Customer relationship management
Course Outcomes	**At the end of the course, the students will be able to** 1. Explain the principles of supply chain management and its drivers and maintaining financial stability in textile apparel industry. 2. Analyze the supply and demand cycle and economies of scale in apparel industry. 3. Explain the role and characteristics of transportation in textile and apparel network. 4. Discuss the importance of coordination and obstacles to co-ordination in supply chain. 5. Analyze the role of supply chain in customer relationship management.

Note: The hours given against each topic are of indicative. The faculty have the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Introduction [9]

Basic principles of supply chain management and logistics, supply chain models, supply chain for volatile market; Supply chain drivers and metrics in apparel industries; Roll of supply chain in the textile and apparel industries financial stability.

Planning Supply & Demand [9]

Planning supply and demand in apparel production house, managing economies of scale, supply cycle and inventory levels; Managing uncertainty in supply chain, safety pricing and inventory; Make Vs buy decision, make Vs hire decision; Geographical identification of suppliers - supplier evaluation, supplier selection, contract negotiations, finalization.

Transportation Designing & Planning [9]

Distribution network and design for global textile and apparel products, models of distribution – facility location and allocation of capacity, uncertainty on design and network optimization; Transportation - role of transportation in supply chain, modes of transportation, characteristics of transportation, transport design options for global textile and apparel network, trade-off in transport design, risk management in transportation, transport decision in practice for textile and apparel industries.

Coordination In Supply Chain & E- Business [9]

Coordination in supply chain: The bullwhip effect, forecasting, obstacles to coordination in supply chain; Supply chain management for apparel retail stores, high fashion; Supply chain in e-business & b2b practices.

Global Practices In Supply Chain [9]

Import - Export management: Documentation, insurance, packing and foreign exchange; Methods of payments – Domestic, international, commercial terms; Dispute handling modes and channels; Supply chain and information system; Customer relationship management.

Total Hours: 45

Text book(s):

1.	Janat Shah, "Supply Chain Management – Text and Cases", Pearson Education, New Delhi, 2009. ISBN: 978-8131715178.
2.	Sunil Chopra and Peter Meindl, "Supply Chain Management-Strategy Planning and Operation", PHI Learning / Pearson Education, 2010. ISBN: 978-81-317-3071-3.

Reference(s) :

1.	David Simchi-Levi, Philip Kaminsky, Edith Simchi-Levi, Ravi Shankar, "Designing and Managing the Supply Chain: Concepts, Strategies, and Cases", Tata McGraw-Hill Education Pvt Ltd. New Delhi, 2010. ISBN-13: 978-0-07-066698-6.
2.	Rahul V Altekar, "Supply Chain Management-Concept and Cases", Prentice-Hall of India Pvt Ltd, New Delhi, 2005. ISBN: 81-203-2859-0
3.	Amir Sinha, Herbert Kotzab, "Supply chain management", Tata McGraw-Hill Education Pvt Ltd. New Delhi, 2012. ISBN-13 : 978-0-07-133343-6.
4.	James B.Ayers, **"**Handbook of Supply chain management**"**, St.Lucle press, 2000.

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50 TT E 54 - Supply Chain Management for Textile and Apparel Industry															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	2	1					2		2	3	2	1	3	2
CO2	2	2									3	1	1	3	2
CO3	3							3		3	3	2	1	3	2
CO4	3	2	2	1								1	2	3	2
CO5	3	2	2							1	2	2	1	3	2

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K.S. Rangasamy College of Technology – Autonomous								R 2018
50 TT E 55 – International Social Compliance								
Elective	Hours / Week			Total Hrs.	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
V	3	0	0	45	3	50	50	100

Objective(s)	• To know the importance of work environment • To be aware regarding the various labour welfare measures • To learn the labour policy • To understand the different social accountability standards • To examine the various compliances and ethical codes
Course Outcomes	**At the end of the course the students will be able to** 1. Describe the concept of minimum wages and working hours. 2. Discuss the functions of trade union and list the labour welfare measures. 3. Summarize the main features brought out in the second national labour commission. 4. Outline the features and benefits of ISO 9001, ISO 14001, SA 8000 and ISO 45001. 5. Implement the standards that are essential for having trade with specific country.

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Work Environment

Wages, Minimum wages – benefits, Bonus; Working hours; Contract labour; Forced and bonded labour – ill effects, child labour; Discrimination at workplace and its prevention; Sexual harassment at work place; Equal remuneration; Freedom of association; Amenities to attract labour. Positive work environment. [9]

Welfare Measures

Trade union – Types, Norms for forming trade union, role and functions; Collective bargaining. Labor welfare measures, ESI Act - features, EPF Act – features, Maternity Benefit Act – features, Gratuity Act – features; Family welfare activities-first aid, rest rooms, crèches, maternity facilities and transport facility, Welfare officer. [9]

Labour Policy and Relations

Labour policy of India, Second National Commission on Labour (NCL) - Major recommendations, Brief study on new labour codes; Employee participation in management, Labour- Management cooperation; Employee involvement in decision making. [9]

Social Accountability Standards

ISO 9001:2015 – features and benefits; SA8000:2014 - features and benefits; ISO 14001:2015 - features and benefits, Features of EMAS; ISO 45001:2018 (OHSAS 18001:2007) - features and benefits, GOTS certification - features and benefits. [9]

Compliance With Ethical Codes

International Labour Organization (ILO) – conventions and functions; The United Nations Global Compact (UNGC); The Ethical Trading Initiative base code (ETI); Business Social Compliance Initiative (BSCI); Initiative Clause Society (ICS); Worldwide Responsible Apparel Production (WRAP); Fair Labour Association (FLA); Social and Labour Convergence Program (SLCP). [9]

Total Hours: 45

Text Book(s):

1.	N.G.Nair, Lata Nair, “Personnel Management and Industrial Relations”, S.Chand and Co., New Delhi, 2001.
2.	C.B.Mamoria and Sathish Mamoria, “Dynamics of Industrial Relations”, 16th revised edition, Himalaya Publishing House, New Delhi, 2019.

Reference(s):

1.	C.S.Venkata Ratnam and Manoranjan Dhal, “Industrial Relations”, 2nd Edition, Oxford University Press, New Delhi, 2017.
2.	S.C.Srivastava, “Industrial Relations and Labour Laws”, 7th Edition, Vikas Publishing House, New Delhi, 2020.
3.	Dr.K.C.Arora, “ISO 9000 to OHSAS 18001”, S.K. Kataria & Sons, New Delhi, 2012.
4.	S.P. Mathur and Nishu Mathur, “Business Ethics and Corporate Social Responsibilities”, New Age International (P) Ltd. Publishers, New Delhi, 2016.

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50 TT E55 – International Social Compliance														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1						3	2	3	2		1	2			2
CO2						3	2	2	3		2	2			2
CO3						3	3	3	3		3	2			2
CO4			2		2	3	3	2	2	2	2	3		2	2
CO5			2		2	3	2	3	3	2	2	3		2	2

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K.S.Rangasamy College of Technology – Autonomous R2018								
50 GE 001 – National Cadet Corps (Air Wing)								
Common to all Branches (General Elective Course)								
Semester	Hours / Week			Total Hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	3	0	2	60	4	50	50	100

Objective(s)	• Develop character , camaraderie, • Inculcate discipline, secular outlook • Enrich the spirit of adventure, sportsman spirit • Ideals of selfless service amongst cadets by working in teams • Improve qualities such as self-discipline, self-confidence, self-reliance and dignity of labour in the cadets.
Course Outcomes	**At the end of the course, the students will be able to** CO1: Display sense of patriotism, secular values and shall be transformed into motivated youth who will carry out nation building through national unity and social cohesion. CO2: Demonstrate the sense of discipline with smartness and have basic knowledge of weapons and their use and handling CO3: Illustrate various forces and moments acting on aircraft CO4: Outline the concepts of aircraft engine and rocket propulsion CO5: Design, build and fly chuck gliders/model airplanes and display static models

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

NCC Organization & National Integration **[9]**

NCC Organization – History of NCC- NCC Organization- NCC Training- NCC Uniform – Promotion of NCC cadets – Aim and advantages of NCC Training- NCC badges of Rank- Honors' and Awards – Incentives for NCC cadets by central and state govt. History and Organization of IAF-Indo-Pak War-1971-Operation Safed Sagar. National Integration- Unity in diversity- contribution of youth in nation building- national integration council- Images and Slogans on National Integration.

Drill &WeaponTraining **[9]**

Drill- Words of commands- position and commands- sizing and forming- saluting- marching- turning on the march and wheeling- saluting on the march- side pace, pace forward and to the rear- marking time- Drill with arms- ceremonial drill- guard mounting.(WITH DEMONSTRATION). Main Parts of a Rifle- Characteristics of .22 rifle- loading and unloading – position and holding- safety precautions – range procedure- MPI and Elevation- Group and Snap shooting- Long/Short range firing (WITH PRACTICE SESSION)

Principles of Flight **[9]**

Laws of motion-Forces acting on aircraft–Bernoulli's theorem-Stalling-Primary control surfaces – secondary control surfaces-Aircraft recognition.

Aero Engines **[9]**

Introduction of Aero engine-Types of engine-piston engine-jet engines-Turboprop engines-Basic Flight Instruments-Modern trends.

Aero Modeling **[9]**

History of aero modeling-Materials used in Aero-modeling-Types of Aero-models – Static Models-Gliders-Control line models-Radio Control Models-Building and Flying of Aero-models.

Total Hours: 45

Text Book(s):

1. "National Cadet Corps- A Concise handbook of NCC Cadets" by Ramesh Publishing House, New Delhi,2014.
2. "NCC OTA Precise" by DGNCC, New Delhi,2014

Reference(s)

1. "Cadets Handbook – Common Subjects SD/SW" by DG NCC, New Delhi,2019
2. "Cadets Handbook – Specialised Subjects SD/SW" by DG NCC, New Delhi,2017

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Rev. No. 3 / w.e.f. 18/01/2023, Passed in BoS Meeting held on 22/12/2022,
Approved in Academic Council Meeting held on 07/01/2023.

50 GE 001 – National Cadet Corps (Air Wing)															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1						3	3	3	3	3		3			
CO2					3						3	2			
CO3	3	2	1	1											
CO4	3	2	1	1											
CO5	3	2	1	1											

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K.S.Rangasamy College of Technology – Autonomous R2018								
50 GE 002 – National Cadet Corps (Army Wing)								
Common to all Branches (General Elective Course)								
Semester	Hours / Week			Total Hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
IV	3	0	2	60	4	50	50	100

Objective(s)	• Develop character , camaraderie, • Inculcate discipline, secular outlook • Enrich the spirit of adventure, sportsman spirit • Ideals of selfless service amongst cadets by working in teams • Improve qualities such as self-discipline, self-confidence, self-reliance and dignity of labour in the cadets.
Course Outcomes	**At the end of the course, the students will be able to** 1: Display sense of patriotism, secular values and shall be transformed into motivated youth who will carry out nation building through national unity and social cohesion. 2: Demonstrate Health Exercises, the sense of discipline, improve bearing, smartness, turnout, develop the quality of immediate and implicit obedience of orders. 3: Basic knowledge of weapons and their use and handling. 4: Aware about social evils and shall inculcate sense of whistle blowing against such evils and ways to eradicate such evils 5: Acquaint, expose & provide knowledge about Army/Navy/ Air force and to acquire information about expansion of Armed Forces, service subjects and important battles

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

NCC Organization & National Integration **[9]**

NCC Organization – History of NCC- NCC Organization- NCC Training- NCC Uniform – Promotion of NCC cadets – Aim and advantages of NCC Training- NCC badges of Rank- Honors' and Awards – Incentives for NCC cadets by central and state govt.

National Integration - Unity in diversity- contribution of youth in nation building- national integration council- Images and Slogans on National Integration.

Basic Physical Training & Drill **[9]**

Basic physical Training – various exercises for fitness(with Demonstration)-Food – Hygiene and Cleaniness. Drill- Words of commands- position and commands- sizing and forming- saluting- marching- turning on the march and wheeling- saluting on the march- side pace, pace forward and to the rear- marking time- Drill with arms- ceremonial drill- guard mounting.(WITH DEMONSTRATION)

Weapon Training **[9]**

Main Parts of a Rifle- Characteristics of .303 rifle- Characteristics of .22 rifle- loading and unloading – position and holding- safety precautions – range procedure- MPI and Elevation- Group and Snap shooting- Long/Short range firing(WITH PRACTICE SESSION) - Characteristics of 5.56mm rifle- Characteristics of 7.62mm SLR- LMG- carbine machine gun – pistol.

Social Awareness and Community Development **[9]**

Aims of Social service-Various Means and ways of social services- family planning – HIV and AIDS- Cancer its causes and preventive measures- NGO and their activities- Drug trafficking- Rural development programmes - MGNREGA-SGSY-JGSY-NSAP-PMGSY-Terrorism and counter terrorism- Corruption – female foeticide -dowry – child abuse-RTI Act- RTE Act- Protection of children from sexual offences act- civic sense and responsibility

Specialized Subject (ARMY) **[9]**

Basic structure of Armed Forces- Military History – War heroes- battles of Indo-Pak war- Param Vir Chakra- Career in the Defence forces- Service tests and interviews.

Total Hours: 45

Text Book(s):

1.	National Cadet Corps- A Concise handbook of NCC Cadets by Ramesh Publishing House, New Delhi, 2014
2.	Cadets Handbook- Specialized Subjects SD/SW published by DG NCC, New Delhi ,2014

Reference(s)

1.	"Cadets Handbook – Common Subjects SD/SW" by DG NCC, New Delhi,2019
2.	"Cadets Handbook – Specialised Subjects SD/SW" by DG NCC, New Delhi,2017

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50 GE 002 – National Cadet Corps (Army Wing)															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1						1		3							
CO2								2							
CO3						1		3							
CO4								2							
CO5								3							

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K.S. Rangasamy College of Technology – Autonomous								R 2018
50 TT L01 - Fibre Science and Technology								
Common to all Branches (Open Elective Course)								
Semester	Hours / Week			Total Hrs.	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
	3	0	0	45	3	50	50	100
Objective(s)	• To impart knowledge on the basic textile terms. • To impart knowledge on the production of natural, fibres. • To impart knowledge on the production of synthetic and regenerated fibres. • To impart knowledge on applications and properties of natural and synthetic fibres. • To impart knowledge on applications and properties of regenerated cellulosic fibres.							
Course outcomes	**At the end of the course, the students will be able to** 1. Classify the textile fibres and its identification. 2. Summarize the cultivation / extraction process, properties and applications of cellulosic fibres. 3. Explain the production, properties and applications of manmade regenerated cellulosic fibres. 4. Summarize the production, properties and applications of protein fibres. 5. Describe the production, properties and applications of synthetic fibres.							

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Introduction

Definitions–Fibre: Textile fibre, staple fibre, filament; Yarn: Spun, Continuous filament, Monofilament and Multifilament; Fabric: Woven, Knitted and Non-woven. Classification of textile fibres with examples. Essential and desirable properties of textile fibres. Standard moisture regain of common fibres. Identification of textile fibres by Microscopic test, burning test and solubility test. [7]

Cellulosic Fibres

Cultivation, properties and applications of cotton; Extraction, properties and application of flax and jute. Study of morphological and chemical structure of natural cellulosic fibres. [9]

Man made Regenerated Cellulosic Fibres

Production process, properties and applications of viscose rayon, modal, lyocell and bamboo fibres; Study of morphological and chemical structure of regenerated cellulosic fibres. [10]

Protein Fibres

Morphological structure and chemical constitution of wool and silk. Types, production process, properties and applications of wool and silk fibres. [9]

Synthetic Fibres

Production, properties and applications of Polyester, Nylon and Polypropylene. Study of morphological and chemical structures of synthetic fibres. [10]

Total Hours: 45

Text book(s):

1.	S.P.Mishra, “A Text book of Fibre science and Technology”, New Age International Publishers, New Delhi. ISBN: 8122412505.
2.	H.V.Srinivasamoorthy, “Introduction to Textile Fibres”, Revised Edition, Wood head Publishing India ISBN: 93850 59572.

Reference(s):

1.	E.P.G.Gohl and L.D.Vilensky, “Textile Science”, CBS Publishers and Distributors, New Delhi.
2.	Cook, J. Gordon, “Hand Book of Textile Fibres: Man-Made Fibres”, Vol. 1 and 2, Merrow Publishing Co. Ltd., England.
3.	Morton W.E and Hearle J.W.S, “Physical properties of textile fibres”, Textile Institute, Manchester.
4.	S.Eichhorn, J.W. S. Hearle, et al.”, “Handbook of Textile Fibre Structure, Volume 1” Wood head Publishing, 2009.

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50 TT L01 – Fibre Science and Technology														
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2	2												2	
CO2	3	1											2		
CO3	2	3													
CO4	2	3													2
CO5	2	2										1			1

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K.S. Rangasamy College of Technology - Autonomous								R 2018
50 TT L02 - Basics of Textile Technology								
Common to all Branches (Open Elective Course)								
Semester	Hours / Week			Total Hrs.	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
	3	0	0	45	3	50	50	100

Objective(s)	• To impart knowledge on the basic textile terms and spinning systems • To impart basic knowledge in the concepts involved in various mechanisms used in weaving • To impart knowledge on knitted and non woven fabrics • To impart knowledge on chemical processing of goods • To impart the functional requirements and basics of garment manufacturing
Course outcomes	**At the end of the course, the students will be able to** 1. Classify the textile fibres and explain the functioning of spinning machine 2. Explain the functioning of weaving machine 3. Summarize the non woven and knitted fabric types and processes 4. Discuss the wet process sequences for various fabrics and summarize the pre treatment processes 5. Elucidate the basics of garment preparatory and garment manufacturing process

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Basics of Fibre Science and Spinning

Definition of fibre, classification of textile fibers; essential fibre properties; sequence of machineries in short staple yarn spinning from ginning to cone winding and their objectives; yarn numbering systems; essential yarn properties. [9]

Basics of Woven Fabric Production

Woven fabric – warp, weft, weaving, path of warp; looms – classification, handloom, power loom, automatic looms, shuttleless looms, special type of looms; preparatory machines for weaving process and their objectives; basic weaving mechanism - primary, secondary and auxiliary mechanisms; essential fabric properties. [12]

Basics of Knitted and Non Woven Fabric Production

Knitting – classification, principle, types of fabrics; nonwoven process –classification, principle, types of fabrics. End uses. [9]

Basics of Chemical Processing

Objectives of the processes - singeing, de-sizing, scouring, bleaching, mercerization; dyeing - classification of dyes, methods and types of dyeing; printing - types and styles of printing. [9]

Basics of Garment Manufacturing

Fabric sourcing; Basic principles of pattern making and grading, marker planning, laying, cutting, sorting, sewing, finishing and packing. [6]

Total Hours: 45

Text book(s):

1.	Hornberer M., Eberle H., Kilgus R., Ring W. and Hermeling H., “Clothing Technology: From Fibre to Fabric”, Europa Lehrmittel Verlag, 2008, ISBN: 3808562250 / ISBN: 978-3808562253.
2.	Carr H. and Latham B., “The Technology of Clothing Manufacture” Backwell Science, U.K., 1994, ISBN: 0632037482 / ISBN:13: 9780632037483

Reference(s):

1.	Cook, J. Gordon, “Hand Book of Textile Fibres: Man-Made Fibres”, Vol. 1 and 2, Merrow Publishing Co. Ltd., England.
2.	Ormerod A, “Modern Preparation and Weaving”, Wood head Publishers Ltd UK, reprint, 2004.
3.	Wynne A., “Motivate Series-Textiles”, Maxmillan Publications, London, 1997
4.	Ruth.E. Glock / Grace I.Kunz, “Apparel manufacturing and sewn product analysis” fourth edition Prentice hall, 2005

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50 TT L02 – Basics of Textile Technology															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	1	2	1					2	2	2	2	1	
CO2	3	2	1	2	1					2	2	2	2	1	
CO3	3	2	1	2	1					2	2	2	2	1	
CO4	3	2	1	2	1					2	2	2	2	1	
CO5	3	2	1	2	1					2	2	2	2	1	

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K.S. Rangasamy College of Technology - Autonomous								R 2018
50 TT L03 - Introduction to Fashion Design								
Common to all Branches (Open Elective Course)								
Semester	Hours / Week			Total Hrs.	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
	3	0	0	45	3	50	50	100

Objective(s)	• To impart knowledge on the basic fashion design • To impart basic knowledge in the clothing • To impart knowledge on the Wardrobe cloth planning • To impart knowledge on the basics Elements of design • To impart the functional requirements of Designer boards and portfolio presentation
Course outcomes	**At the end of the course, the students will be able to** 1. Define and discuss the fashion and related terms and reason for change in fashion and the classification 2. Describe clothing and its purpose, Role of clothing and its status. 3. Describe the selection of clothing for various age groups, Fashion apparel and wardrobe planning. 4. Explain the elements and principles of the design, with the effects in the apparel 5. Bounce out the theme and development of portfolio.

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Introduction to Fashion

Origin of fashion - terms and definitions - reasons for change in fashion - classification of fashion – Style, Classic, FAD, Trend – theories of fashion – movement of fashion - fashion cycle. [9]

Introduction to Clothing

Understanding clothing - Purpose of clothing: protection, modesty, attraction etc - Importance of clothing - Clothing Culture, Men and Women clothing and ornamentation - Role and status of clothing - Clothing according to climatic conditions – factors to be considered in the selection of clothing. [9]

Wardrobe planning

Selection of clothes - Clothes for children, middle-aged and adults. Types of clothes according to different types of human figure, Different materials for different clothes, Fabrics and colours suitable for different garments. Planning for clothing needs: Formal clothing, Clothes for parties, Clothes for sports, Casual Clothes for casualwear. Wardrobe Planning: Wardrobe for men and women [9]

Elements and Principle of Design

Elements of Design: Introduction on basics Elements of design - Silhouette, Details, Texture, Color, Lines, Principle of design: Introduction to principles of Elements of design - Proportion, Balance, Rhythm, Center of Interest, Harmony [9]

Design and Development

Designer boards - Mood board, fabric board, colour board, accessory board. Fashion illustration – head theories, Illustration techniques – strokes, hatching, shading; Colouring techniques – Medias for colouring. Portfolio presentation – styles of presentation - Fashion shows. [9]

Total Hours: 45

Text book(s):

1.	Munslow, Janine, McKelvey, Kathryn “Fashion Design Process Innovation and Practice”, 2nd Edition, wiley, 2012.
2.	Nicola White, Ian Griffiths, “The Fashion Business Theory, Practice, Image”, Berg, 2000.

Reference(s):

1.	Sumathi, G.J. “Elements of Fashion and Apparel Design” New Age International Publishers, New Delhi.
2.	Kathryn McKelvey “Fashion Source Book” Balckwell Publishing New Delhi.
3.	Jane Mills and Janet K.Smith “Design Concepts” Fairchild Publications, New York.
4.	Jeannette A.Jarnow, Mirianr Guerreiro & Beatrice Judelle, “Inside the fashion business" 4th edition Mac Millan Publishing Company, NewYork.

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50 TT LO3 – Introduction to Fashion Design															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	3	2	2			1			1	3	2	2	2		
CO2	3	2	2	1		1			1	3	2	2	2	1	
CO3	3	2	2	1	1	1			1	3	2	2	2	1	1
CO4	3	2	2	1	2	1		1	2	3	3	2	2	1	1
CO5	3	2	2	1	2	1	1	1	2	3	3	2	2	1	1

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K.S. Rangasamy College of Technology - Autonomous								R 2018
50 TT L04 - Industrial Textiles								
Common to all Branches (Open Elective Course)								
Semester	Hours / Week			Total Hrs.	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
	3	0	0	45	3	50	50	100
Objective(s)	• To impart the knowledge on various fibers used in Industrial textile • To impart the knowledge on medical textiles • Understand the basic knowledge on geo and agro textiles • To impart the knowledge on protective and smart textiles • Understand the industrial application of textiles							
Course outcomes	**At the end of the course, the students will be able to** 1. Explain the scope, classification & application of industrial textiles 2. Conclude the role of textile materials in the medical textiles product development. 3. Describe the properties required to use in Agro textiles & Geo textiles and the application of Geo & Agro textiles. 4. Summarize the functions & applications of protective & smart textiles. 5. Outline the miscellaneous & Industrial applications of textile products.							

Note: Hours notified against each unit in the syllabus are only indicative but are not decisive. Faculty may decide the number of hours for each unit depending upon the concepts and depth. Questions need not be asked based on the number of hours notified against each unit in the syllabus**.**

Introduction of Industrial Textile

Industrial Textiles: Introduction - Definition, Scope of Industrial textiles, Classification & Application of Industrial textiles. Fibres – Conventional Fibres, High Performance fibres, Ultra fine and Novelty fibres. [9]

Medical Textiles

Medical Textiles: Introduction, Materials used & its requirements**.** Classification of Medical textiles - Textiles for implantations, Non-implantations textiles, Extra-corporeal devices, Healthcare & Hygiene Products. [9]

Geo & Agro Textiles

Geo Textiles: Geo textile, Geo synthetics, Fibres and its selection for Geo textiles, Functions of Geo textiles, Engineering properties of Geo textiles, Geo textile structure, Applications for natural Geo textiles.
Agro Textiles - Textiles in Agriculture - Fibres details & Properties, Applications of Agro textiles [9]

Protective & Smart Textiles

Protective Textiles: Selection of protective clothing materials, fibres and fabrics for Protective Textiles, Textiles for environmental protection; Thermal insulation materials; Nuclear protective fabrics.
Smart Textiles: Role of smart materials in textiles, Shape Memory Fibres, Shape Memory Material, Concepts associated with shape memory materials. [9]

Industrial Applications of Textiles

Textiles in Electronics, Textile reinforcement products, Textiles for Banners and Flags, Canvas Covers and Tarpaulins, Ropes and Nets, Home and Office Furnishings, Textiles in sportswear. [9]

Total Hours: 45

Text book(s):

1.	A.R.Horrocks & S.C. Anand (Edrs.), Handbook of Technical Textiles, The Textile Institute, Manchester, U.K., Woodhead Publishing Ltd., Cambridge, England, 2000.
2.	T.Matsuo, “Fiber materials for Advanced Technical Textiles”, CRC publication, 2008.

Reference(s):

1.	N.W.M. John, “Geotextiles”, Blackie, London, ISBN: 0-216-91995-9, 1987.
2.	S. Adanur “Wellington Sears Handbook of Industrial Textiles”, Technomic Publishing Co. Inc., Lancaster, Pennylvania, ISBN: 1-56676-340-1, 1995.
3.	S. Anand, “Medical Textiles”, Text. Inst., 1996, ISBN: 185573317X.
4.	Richard. A.Scott, Textiles for Protection, CRC press, Woodhead Publication, USA, 2005.

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50 TT L04 - Industrial Textiles															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	2		3	3	2	1	2			2		3	2		
CO2	2		3	3	2	1	2			2	2	3	2		
CO3	2		2	2	2	1	1			1		3	2		
CO4	2		3	3	2	1	2			2		3	2		
CO5	2		3	3	2	1	2			2	2	3	2		

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K.S. Rangasamy College of Technology - Autonomous								R 2018
60 TT H01- Fashion Design - Principles and Silhouettes								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
	3	0	0	45	3	50	50	100
Objective(s)	• To enable Students understand and comprehend the fundamentals of visual art. • To impart the knowledge of properties of lines, shapes, colors and compositions made out of them. • To enable the students develop characteristic shapes, forms and textures.							
Course Outcomes	**At the end of the course, the students will be able to** 1. To learn the basics of sketching and drawing 2. Gain knowledge on different types of colour schemes 3. To learn the atheistic of art and fashion 4. To understand the principles of designing 5. Gain knowledge on types of fashion accessories							

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Fundamentals of Visual Art

Drawing with perspectives - single point and two point perspectives. Drawing without perspectives planar drawing. Situation sketching, drawing from a photograph. Highlighting shades and values in a drawing, Abstraction and developing shapes from common drawing elements: angle and proportion. [9]

Fashion Rendering

Color theory, Psychological primary colors& secondary colors, Different types of color schemes. Color rendering - water colors, color pencils, oil pastels and acrylics. Features of painted Artefacts. Elements and principles of design in Art and sculpture. [9]

Art Interpretation

Different types of Art styles-Romantism, Neo classicism, Art deco, Modern art, Abstract expressionism, Surrealism, Pop art & Post modern Art. Aesthetics of art -subject view, composition view, content view and context view. Gestalt principles of perception, Visual core concepts of fashion. [9]

Principles of Fashion Designing

Principles of fashion designing: embellishments, asymmetrical forms, biomorphic forms, structured garments, layering and wrapping styles, fluid draping and flagging drape lines, body conscious dresses, feminine patterns, movement and pattern, texture and motifs. [9]

Fashion Accessories

Fashion accessories-Hair accessories, headgear, neck accessories, Shoe accessories, ear accessories, brooches, ties and scarves, shawls, sashes. Carried accessories - Handbags and umbrellas. [9]

Total Hours: 45

Text book(s):

1. Laura Volintesta, language of fashion design: 26 principles every fashion designer should know, Rockport publishers, 2014.
2. Lois Fichner-Rathus, Understanding Art, Clark baxter, Tenth Edition, 2011

Reference(s) :

1. Francis D.K. Ching with Steven P. Juroszek, Design drawing, John wiley & sons , second edition, 2010
2. Janice G Ellinwood, Fashion by design, Fairchild books, 2011
3. Valerie steele, Encyclopedia of clothing and fashion, Thomson gale, 2005

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60 TT H01- Fashion Design - Principles and Silhouettes												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	2					2	3	3	2	
CO2	3	3	2	2	2			2	3	3	2	
CO3	3	3	2	2	2			2	3	3	2	
CO4	3	3	2			2	2	2	3	3	2	
CO5	3	3	2					2	3	3	2	
3- Strong;2-Medium;1-Some												

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K.S. Rangasamy College of Technology - Autonomous								R 2018
60 TT H02- Colour Communication								
B.Tech. Textile Technology								
Semester	Hours / Week			Total	Credit	Maximum Marks		
	L	T	P	hrs	C	CA	ES	Total
	3	0	0	45	3	50	50	100
Objective(s)	• The student will be able to understanding colour psychology for various environments. • The student will be able to gain knowledge on the impact of colour for different moods. • The student will be able to gain knowledge on various theories of colour.							
Course Outcomes	**At the end of the course, the students will be able to** 1. Learn the basics of colour perceptions 2. Understand colour applications in different forms 3. Apply subtractive colour schemes 4. Learn about colour and its applications in story content 5. Gain knowledge on colour vision							

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

COLOUR PSYCHOLOGY AND PSYCHOLOGICAL PERCEPTION OF INDIVIDUAL COLOURS:

Definition - Introduction from the psychological view - characteristics and effects of major hues - Etymology - Stylistic and cultural origins. Colour sense - definition, inside view of ability to perceive variations in colour - Luminosity and saturation. Colour aids impression - External causes of colour in sensation - reflections, transmission, and selective absorption - Colour perceptions - Colour blindness - Colour impression - Mood and emotions - Colour and appetite - Colour and flavour - Symbolisms of warm and cool colours,Transmittance measurement- solution colorimetry. [9]

SOCIO-ECONOMIC ASPECTS OF COLOUR AND COLOUR IN NATURE AND ART:

Economic status, towards imagination, Colour function and cognitions - Bathroom, Bed room, Kitchen, Drawing and Dining rooms, Store room, Work room, Office premises.The hues of plants, animals and insects - Colours of inorganic substances - Colour expresses moods of nature - Use of colour in painting - three typical methods in oil painting - Experiments with effects of oil paints - The representation of sun lights**.** [9]

COLOUR AND PSYCHOANALYSIS:

Preference and stimulus/effect, Gestalt psychology, object and ground, relating to colour: age related preference, gender preference, and cultural preference. Apply techniques to subtractive and additive color schemes-Compare and contrast subtractive and additive color schemes-Discuss the history and theory of color-Generate additive color schemes-Generate subtractive color schemes -Describe various color palettes-Pre-organize color design for film-Develop color storyboard keys -Develop color script. [9]

PSYCHOLOGICAL IMPACT OF COLOR:

Describe the psychological impact of color-Explain color and its emotional impact in film composition and narrative-Demonstrate editing of color from cut to cut or shot to shot for emotional impact -Discuss cultural variations in the psychology of color. Relate color theory to production and post production processes-Demonstrate color calibration as relates to output-Discuss color theory as it relates to art direction and production design-Exhibit color rhythm, timing, spacing, temperature, atmosphere, composition, balance, and speed to impact film-Generate examples of color design to build story content. [9]

THEORIES OF COLOUR :

Theories of Color Vision- Comparative Color Vision and Evolution-Dispositions, Dispositional Theories of Color-Dispositional Theories Continued-Color Eliminativism-Primary Quality Theories of Color-Functionalist Primary Quality Theories of Color-Experience, Color Experience, and Identity Theories-Intentionalist Accounts of Color Experience-: Spectrum Inversions-The Knowledge Argument and the Explanatory Gap. [9]

Total Hours: 45

Text book(s):

1. M L Gulrajani. Colour measurement: Principles, advances and industrial applications, Nov 2010

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2.	Hylda Rhodes and Henri M. Leon, The Psychology and Tradition of Colour, Kessinger Publishing, LLC, 2005.
Reference(s) :	
1.	Leatrice Eiseman, Colour: Messages & Meanings: A Pantone Colour Resource, Hand Books Press USA, 2006.
2.	Frank H. Mahnke, Colour, Environment, & Human Response, Wiley, Singapore, 1996.
3.	Steven Bleicher, Contemporary Colour Theory and Use, Steven Bleicher Publishing, 2004.
4.	Dorothee Mella, Language of Colour, Grand Central Publishing, New York, 1988.

60 TT H02- Colour Communication												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	2					2	3	3	2	
CO2	3	3	2			2	2	2	3	3	2	
CO3	3	3	2	2	2			2	3	3	2	
CO4	3	3	2			2		2	3	3	2	
CO5	3	3	2					2	3	3	2	
3- Strong;2-Medium;1-Some												

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K.S. Rangasamy College of Technology - Autonomous								R 2018
60 TT H03- Advances in Pattern Making and Grading								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
	3	0	0	45	3	50	50	100

Objective(s)	• To impart knowledge on human body measurements and creating pattern from the measurements. • To develop commercial pattern with design aspect by manipulating the basic pattern. • To fabricate patterns of different sizes by grading the basic pattern.
Course Outcomes	**At the end of the course, the students will be able to** 1. Gain knowledge on anthropometry 2. Acquire the skills for basic pattern making 3. Learn about various types of sleeves and colours 4. Gain knowledge on the types of yokes and pockets 5. Understand the basics of grading technology

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

INTRODUCTION TO PATTERN MAKING :

Anthropometry measurements, Human Anatomy, Clothing sizing systems, Body Ideals - Eight Head theory: Body proportions, Height and weight distribution. Pattern making tools, Types of paper pattern, Pattern making methods Pattern details. Measuring techniques - measuring the form- circumference, vertical and horizontal measurements. [9]

BASIC PATTERN AND MANIPULATION:

Drafting Bodice Blocks, Torso Blocks - Skirt Blocks. Fit- importance, standards, Evaluating fit-Bust, neckline, shoulder, armscye, collar, sleeve. Flat Pattern Techniques: Dart manipulation - slash and spread and pivotal transfer methods. Displacement of bust dart - waist line, side seam, arm hole, neck line, front edge. Creating Fullness using - tuck darts, pleats, flares, gathers, style lines. [9]

BODY COMPONENTS: SLEEVE, COLLAR, CUFF:

Sleeve: Set-in-Sleeves (plain, puff, bell, bishop, circular), Raglan, Sleeves combined with bodice (Modified armholes, Kimono, Dolman). Cuff: shirt cuff, self-faced cuff, French cuff, contoured cuff. Collars: Classification, Factors to be considered while selecting Collars. Types - peter pan, partial roll, cape, scalloped, sailor, square, full roll convertible, shawl, Shakespeare. [9]

BODY COMPONENTS: YOKE, POCKET: Yokes:

Factors to be considered while selecting Yoke, preparing patterns for yokes - partial yoke, yoke without fullness, yoke with fullness, yoke supporting or releasing fullness. Pockets: Factors to be considered while selecting Pocket. Types - patch, bound, welt, side seam, front hip. [9]

PATTERN GRADING:

Grading- definition, principles, types, grading points, & importance of manual and computerized grading and softwares used for grading: Marker planning and marker making. [9]

Total Hours: 45

Text book(s):

1. Helen Joseph Armstrong, Pattern Making for Fashion Designers 5th Edition, Prentice-Hall, New Jersey, 2010.
2. Fan J, Yu W, and Hunter L., Clothing Appearance and Fit: Science and Technology, Wood head Publishing Limited, 2004

Reference(s) :

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1.	Ashdown S. P., Sizing in Clothing, Wood head Publishing Limited, 2007
2.	Winifred Aldrich, Pattern Cutting for Menswear, 4th edition, Blackwell Science Publisher, USA, 2006.
3.	Mary Mathew, Practical Clothing Construction, Part-II, Designing Drafting and Tailoring, Cosmic Press, Chennai, 1999

60 TT H03- Advances in Pattern Making and Grading												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	2	2					2	3	3	2	
CO2	3	2	2	2	2			2	3	3	2	
CO3	3	2	2	2				2	3	3	2	
CO4	3	2	2	2	2		2	2	3	3	2	
CO5	3	2	2			2		2	3	3	2	
3- Strong;2-Medium;1-Some												

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K.S. Rangasamy College of Technology - Autonomous								R 2018
60 TT H04- Fashion Brand Management								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
	3	0	0	45	3	50	50	100

Objective(s)	• To understand the methods of managing brands and strategies for brand management. • To understand the importance of brands • To gain an insight into various brand management activities. • Students will be able to understand various types of intellectual property rights • Students will be able to read, understand and interpret branding.
Course Outcomes	**At the end of the course, the students will be able to** 1. Gain knowledge on branding and strategic planning 2. Learn brand equity and research techniques 3. Gain Knowledge on consumer behavior 4. Summaries the concepts of market communication in branding 5. Strategies brand revitalization

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

OVERVIEW OF BRAND MANAGEMENT

Significance of branding -brand defined -Difference between a Product and a Brand - rationale for building a brand - types of brands - Branding Challenges -Creating a brand - Strategic planning for the brand -Designing brand Identity -Measuring brand personality - Brand Image - Luxury Brands- Organizational culture and brand performance -Brand Mantras and Internal branding for a successful brand - Case study. [9]

UNDERSTANDING AND MEASURING BRAND EQUITY

Introduction - What is brand equity - Brand equity defined - Need for building brand equity -Steps in building a Brand -Researching for brand equity -Tracking a brand -The brand chain - Research techniques -Quantitative research techniques applied to branding - Measuring brand equity -Need for measuring brand equity -Methods to measure brand equity -Case Study. [9]

UNDERSTANDING CONSUMERS AND MARKETS

Consumer behavior and the role of branding - concept of perception- brand evaluation and perception by customers -Consumer attitude -the Indian Consumer - Model of consumer decision making - Factors affecting consumer behavior - Brand loyalty and Brand commitment - Factors affecting brand loyalty - Concept of brand positioning - Positioning defined -Positioning strategy - Guiding principles for positioning -Repositioning- Case Study. [9]

BUILDING RESILIENT BRANDS

Defining branding strategy -Strategies for choosing a brand name-Line extension Category Extension - Brand Sketching - Launching a brand extension - Managing brand architecture - Brand roles in the brand portfolio - Brand relationship spectrum -Managing Brands over time - Brand challenges-Reinforcing brands-Brand revitalization -Brand turnaround-Case Study. [9]

MANAGING BRANDS

Branding and the marketing programme - Product Strategy -Pricing Strategy -Distribution Strategy - E-branding : Building the brand online -E-business strategy -Marketing and the internet - Branding and marketing communications -Communication options : Personal selling, sales promotions, Events and compaign marketing , Direct Marketing, Publicity and PR, Word of mouth, Internet marketing - Case Study. [9]

Total Hours: 45

Text book(s):

1. David A. Aaker, Managing Brand Equity, Simon and Schuster, 2009.
2. Kirti Dutta, Brand Management Principles and Practices-2012, Oxford University Press.

Reference(s) :

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1.	Moorthi YLR, Brand Management I edition, Vikas Publishing House 2012
2.	LanBatey, AsainBranding A Great way to fly, PHI, Singapore, 2002.
3.	NR Subbaram, Demystifying Intellectual Property Rights, ISBN:9788180385780, LexisNexis, 2011
4.	Sharon Givoni, Owning It: A Creative's Guide to Copyright, Contracts and the Law, Creative Minds Publishing, 2015

60 TT H04- Fashion Brand Management												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	2					2	3	3	2	
CO2	3	3	2	2				2	3	3	2	
CO3	3	3	2		2		2	2	3	3	2	
CO4	3	3	2	2		2		2	3	3	2	
CO5	3	3	2					2	3	3	2	
3- Strong;2-Medium;1-Some												

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K.S. Rangasamy College of Technology - Autonomous								R 2018
60 TT H05 Garment Production Machinery and Equipment								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
	3	0	0	45	3	50	50	100

Objective(s)	• Students will be familiar with the functions and working of various machines used in apparel industry. • Students will know the manufacturing process of various machines in apparel industry. • Students will sort out the various troubles shooting which occurs in garment manufacturing unit. • Student will be able to understand the type of fabric spreading and cutting machines. • Student will be able to Gain knowledge about the sewing production equipment and its functions.
Course Outcomes	**At the end of the course, the students will be able to** 1. To learn the functioning of the spreading equipments. 2. Gain knowledge on cutting machine types and SNLS Machine 3. Learn about over lock and flat lock machine 4. Gain Knowledge on fusing and pressing machine. 5. Learn about sewing machine maintenance

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

SPREADING MACHINES

Spreading: Fabric package types, fabric types, spreading methods, and machines, requirements of spreading, factors affecting spreading. Basic concepts of marker making -Computer aided marker making (CAM)- Features of a digitizer, marker and lay planning, duplicating, fabric consumption, plotters- flat bed plotter, drum plotter. [9]

CUTTING MACHINES AND SINGLE NEEDLE LOCK STITCH MACHINES

Cutting: Mechanisms and features-straight knife, round knife, band knife, die cutting, laser cutting, computerized and other modern techniques, principles of drill, notches and thread makers

SNLS: Sewing Needle-Size, Parts, Types and applications. Sewing machine parts and its functions- Needle bar, Bobbin, Bobbin case / hook, Throat plate, Take-up devices, Stitch regulator. Classification- SNLS, DNLS, Multi needle & Bar tacking machine. Chain stitch, over lock, flat lock, button fixing, button holing-working principle and functions [9]

OVER LOCK, FLAT LOCK AND SPECIAL ATTACHMENTS IN SEWING MACHINE

Over-lock and Flat-lock Sewing Machines: Loopers - eye and blind, spreader, Trimmers, Take-up devices: types, Stitch cycle timing diagram, Machine adjustments

Feeding mechanism-types and functions- drop, differential, belt, variable top and bottom feed, puller, needle feed and unison feed. Machine speed and rate of feed, stitch size regulation. Types, guides- arm, cylindrical and flat guides, folders and binders, types of presser foot & its functions. [9]

FUSING AND FINISHING MACHINES

Fusing equipment - working principles, types, and its functions. Pressing equipment- working principles, types & its functions. Garment folding-types Packaging- types. Selection of packaging design based on materials, method and equipment. [9]

TROUBLE SHOOTING AND MACHINE MAINTENANCE

Trouble Shooting: Problems in sewing -Broken, Miss Stitch, needle hole, needle and thread breakage, control of oil stains, seam pucker, feed mechanism problems and sewing operations, causes and their remedial measures. Sewing Machine Maintenance: Preventive maintenance, break down maintenance, schedule- daily, weekly and monthly, setting and adjustment. [9]

Total Hours: 45

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Text book(s):	
1.	R.Rathinamoorthy & R.Surjit, Apparel Machinery and Equipment, Wood head Publishing India in Textiles, New Delhi, 2015.
2.	Carr and Latham's, Technology of Clothing Manufacture, 4th Edition, Om Books International, New Delhi May 2008.
Reference(s) :	
1.	Fairhurst, Advances in apparel production, ISBN 1 84569 2950, Wood head publishing, 2008.
2.	Wedny Gardiner, Sewing Basics, Sally Milner Publishing, 2003.
3.	Fredrerick H Abernathy, John T Dunlop, A Stitch in Time- Apparel Industry, Blackwell sciences, 1999.
4.	Claire Shaeffer, Sewing for Apparel Industry, Pearsons Prentice Hall, New Jersey, USA, 2000.

60 TT H05 Garment Production Machinery and Equipment												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	2						2		3	
CO2	3	3		2					2		3	
CO3	3	3	2					2	2		2	
CO4	3	3	2					2		2	2	
CO5	3	3								2	2	
3- Strong;2-Medium;1-Some												

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K.S. Rangasamy College of Technology - Autonomous								R 2018
60 TT H06 Fashion Design: Process, Innovation and Practice								
B.Tech. Textile Technology								
Semester	Hours / Week			Total hrs	Credit	Maximum Marks		
	L	T	P		C	CA	ES	Total
	3	0	0	45	3	50	50	100
Objective(s)	• Student will be able to understand the sourcing ideas and formulation of design. • Student will be able to learn the concepts of boards and methods of display. • Student will be able to gain knowledge about the fabric sourcing and pattern development. • Students will be familiar with the functions of Pattern adaptation and prototype preparation. • Students will understand the garment finishing process and portfolio preparation.							
Course Outcomes	**At the end of the course, the students will be able to** 1. Learn sourcing ideas and formulation of design. 2. Summarize the procedure for mood and story boards. 3. Gain knowledge on fabric sourcing and pattern construction. 4. Outline the procedure for prototype preparation 5. Express the requirement of portfolio presentation.							

Note: The hours given against each topic are of indicative. The faculty has the freedom to decide the hours required for each topic based on importance and depth of coverage required. The marks allotted for questions in the examinations shall not depend on the number of hours indicated.

Concept and Theme Development

Inspiration – Idea sourcing – Research and adaptation – Exposure to new ideas to encourage originality of thought. Theme and Direction for Design Brief – Fabric theme. Colour story – Concept and direction – Formulation of design brief. Knowledge of fashion trends and designers who set them. [9]

Development of Mood Boards and Story Boards

Creation of concept boards – mood boards and illustration boards – Methods of displaying the fashion collection – Techniques of presentation for selection. Visualization and Communication – Idea sheets, Organization of illustrated designs into group/story presentation drawings/illustrations – Production of drawings for sample development. [9]

Fabric Sourcing and Pattern Development

Fabric selection – Sourcing of fabrics available in the market place – Analysis of functional and aesthetic characteristics of fabrics. Selection of fabric for different end uses. Realization – Pattern construction and development – Toile preparation – Making-up and Finishing process of Prototypes – Consolidation of collection for realization and presentation – From Toiles to Actual Garments. [9]

Pattern Adaptation and Prototype Preparation

Pattern adaptation and development – Making-up process – Fitting on work stand. Modification for material and production constraints – Co-ordination with Accessories – Selection of accessories for co-ordination – Use of accessories to enhance the total look. [9]

Garment Finishing and Presentation

Actual garment construction steps, Fine tuning of the garment with relevant embellishments – Embroidery, Appliqué work, Patch work, Black work, Bead and Sequins work, Richelieu work, Reticella work, Cut work, Eyelet work, Badla work, Mirror work. Presentation of Portfolio (including costing) for garments with reference to occasions and necessary concepts, details.

[9]

Total Hours: 45

Text book(s):

1. Kathryn McKelvey, Janine Munslow, "Fashion Design: Process, Innovation and Practice", Black Well Science Publisher, UK, 2003.

Reference(s) :

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1.	Linda Tain, Portfolio Presentation for Fashion Designers, Fairchild Books & Visuals, USA, 1998.
2.	Sharon L. Tate, Mona S. Edwards, “Inside Fashion Design”, Fifth edition, Prentice Hall, New Delhi, 2003.
3.	Gavin Wadell, “How Fashion Works: Couture, Ready-to-Wear and Mass Production”, Blackwell Science Publisher, UK, 2004.

60 TT H06 Fashion Design: Process, Innovation and Practice												
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	2					2	3	3	2	
CO2	3	3	2	2	2			2	3	3	2	
CO3	3	3	2	2	2			2	3	3	2	
CO4	3	3	2			2	2	2	3	3	2	
CO5	3	3	2					2	3	3	2	
3- Strong;2-Medium;1-Some												

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