VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Scheme of Teaching and Examination 2018 – 19
Outcome Based Education(OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2018 – 19)

Common to Textile and Silk Technology Courses

III SEMESTER

Sl. No	Course and Course Code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P					
1	BSC	18TX31	Statistical Applications to Textiles	Textile	3	2	--	03	40	60	100	4
2	PCC	18TX32	Textile Fibres	Textile	3	2	--	03	40	60	100	4
3	PCC	18TX33	Spinning Technology-I	Textile	3	0	--	03	40	60	100	3
4	PCC	18TX34	Weaving Technology-I	Textile	3	0	--	03	40	60	100	3
5	PCC	18TX35	Chemical Processing of Textiles-I	Textile	3	0	--	03	40	60	100	3
6	PCC	18TXL36	Spinning Technology Lab-I	Textile	--	2	2	03	40	60	100	2
7	PCC	18TXL37	Weaving Technology Lab-I	Textile	--	2	2	03	40	60	100	2
8	PCC	18TXL38	Chemical Processing of Textiles Lab-I	Textile	--	2	2	03	40	60	100	2
9	HSMC	18KVK39/49	Vyavaharika Kannada (Kannada for communication)/	HSMC	--	2	--	--	100	--	100	1
		18KAK39/49	Aadalitha Kannada (Kannada for Administration)									
		OR										
		18CPH39	Constitution of India, Professional Ethics and Cyber Law		1	--	--	03	40	60		
					Examination is by objective type questions							
				TOTAL	**16** **OR** **18**	**12** **OR** **10**	**06**	**24** **OR** **27**	**420** **OR** **360**	**480** **OR** **540**	**900**	**24**

Note: BSC: Basic Science, PCC: Professional Core, HSMC: Humanity and Social Science, NCMC: Non-credit mandatory course.

18KVK39 Vyavaharika Kannada (Kannada for communication) is for non-kannada speaking, reading and writing students and 18KAK39 Aadalitha Kannada (Kannada for Administration) is for students who speak, read and write kannada.

Course prescribed to lateral entry Diploma holders admitted to III semester of Engineering programs

10	NC MC	18MATDIP31	Additional Mathematics - I	Mathematics	02	01	--	03	40	60	100	0

(a)The mandatory non – credit courses Additional Mathematics I and II prescribed for III and IV semesters respectively, to the lateral entry Diploma holders admitted to III semester of BE/B.Tech programs, shall attend the classes during the respective semesters to complete all the formalities of the course and appear for the University examination. In case, any student fails to register for the said course/fails to secure the minimum 40 % of the prescribed CIE marks, he/she shall be deemed to have secured F grade. In such a case, the students have to fulfil the requirements during subsequent semester/s to appear for SEE.
(b)These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree.

Courses prescribed to lateral entry B. Sc degree holders admitted to III semester of Engineering programs

Lateral entrant students from B.Sc. Stream, shall clear the non-credit courses Engineering Graphics and Elements of Civil Engineering and Mechanics of the First Year Engineering Programme. These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree.

AICTE Activity Points to be earned by students admitted to BE/B.Tech/B.Plan day college programme (For more details refer to Chapter 6, AICTE Activity Point Programme, Model Internship Guidelines):
Over and above the academic grades, every Day College regular student admitted to the 4 years Degree programme and every student entering 4 years Degree programme through lateral entry, shall earn 100 and 75 Activity Points respectively for the award of degree through AICTE Activity Point Programme. Students transferred from other Universities to fifth semester are required to earn 50 Activity Points from the year of entry to VTU. The Activity Points earned shall be reflected on the student's eighth semester Grade Card.
The activities can be spread over the years, anytime during the semester weekends and holidays, as per the liking and convenience of the student from the year of entry to the programme. However, minimum hours' requirement should be fulfilled. Activity Points (non-credit) have no effect on SGPA/CGPA and shall not be considered for vertical progression.
In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Scheme of Teaching and Examination 2018 – 19
Outcome Based Education(OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2018 – 19)

Common to Textile and Silk Technology Courses

IVSEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P					
1	BSC	18TX41	Textile Mechanics and Calculations	Textile	3	2	--	03	40	60	100	4
2	PCC	18TX42	Textile Polymer Science	Textile	3	2	--	03	40	60	100	4
3	PCC	18TX43	Spinning Technology-II	Textile	3	0	--	03	40	60	100	3
4	PCC	18TX44	Weaving Technology-II	Textile	3	0	--	03	40	60	100	3
5	PCC	18TX45	Chemical Processing of Textiles-II	Textile	3	0	--	03	40	60	100	3
6	PCC	18TXL46	Spinning Technology Lab-II	Textile	--	2	2	03	40	60	100	2
7	PCC	18TXL47	Weaving Technology Lab-II	Textile	--	2	2	03	40	60	100	2
8	PCC	18TXL48	Chemical Processing of Textiles Lab-II	Textile	--	2	2	03	40	60	100	2
9	HSMC	18KVK39/49	Vyavaharika Kannada (Kannada for communication)/	HSMC	--	2	--	--	100	--	100	1
		18KAK39/49	Aadalitha Kannada (Kannada for Administration)									
		OR										
		18CPH49	Constitution of India, Professional Ethics and Cyber Law		1	--	--	03	40	60		
					Examination is by objective type questions							
				TOTAL	**16**	**12**	**06**	**24**	**420**	**480**	**900**	**24**
					OR	**OR**		**OR**	**OR**	**OR**		
					18	**10**		**27**	**360**	**540**		

Note: BSC: Basic Science, PCC: Professional Core, HSMC: Humanity and Social Science, NCMC: Non-credit mandatory course.

18KVK39/49 Vyavaharika Kannada (Kannada for communication) is for non-kannada speaking, reading and writing students and 18KAK39/49 Aadalitha Kannada (Kannada for Administration) is for students who speak, read and write kannada.

Course prescribed to lateral entry Diploma holders admitted to III semester of Engineering programs

10	NCMC	18MATDIP41	Additional Mathematics - II	Mathematics	02	01	--	03	40	60	100	0

((a)The mandatory non – credit courses Additional Mathematics I and II prescribed for III and IV semesters respectively, to the lateral entry Diploma holders admitted to III semester of BE/B.Tech programs, shall attend the classes during the respective semesters to complete all the formalities of the course and appear for the University examination. In case, any student fails to register for the said course/fails to secure the minimum 40 % of the prescribed CIE marks, he/she shall be deemed to have secured F grade. In such a case, the students have to fulfil the requirements during subsequent semester/s to appear for SEE.

(b)These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree.

Courses prescribed to lateral entry B. Sc degree holders admitted to III semester of Engineering programs

Lateral entrant students from B.Sc. Stream, shall clear the non-credit courses Engineering Graphics and Elements of Civil Engineering and Mechanics of the First Year Engineering Programme. These Courses shall not be considered for vertical progression, but completion of the courses shall be mandatory for the award of degree.

AICTE activity Points: In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Scheme of Teaching and Examination 2018 – 19
Outcome Based Education(OBE) and Choice Based Credit System (CBCS)
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Common to Textile and Silk Technology Courses

V SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P					
1	HSMC	18TX51	Management and Entrepreneurship In Textile Industry	Textile	2	2	--	03	40	60	100	3
2	PCC	18TX52	Manufactured Fiber Technology	Textile	3	2	--	03	40	60	100	4
3	PCC	18TX53	Weaving Technology-III	Textile	3	2	--	03	40	60	100	4
4	PCC	18TX54	Chemical Processing of Textiles-III	Textile	3	2	--	03	40	60	100	4
5	PCC	18TX55	Textile Testing-I	Textile	3	--	--	03	40	60	100	3
6	PCC	18TXL56	Weaving Technology Lab-III	Textile	--	2	2	03	40	60	100	2
7	PCC	18TXL57	Chemical Processing of Textiles Lab-III	Textile	--	2	2	03	40	60	100	2
8	PCC	18TXL58	Textile Testing Lab-I	Textile	--	2	2	03	40	60	100	2
9	HSMC	18CIV59	Environmental Studies	Civil/ Environmental [Paper setting: Civil Engineering Board]	1	--	--	02	40	60	100	1
				TOTAL	**15**	**14**	**6**	**26**	**360**	**540**	**900**	**25**

Note: PCC: Professional Core, HSMC: Humanity and Social Science.

AICTE activity Points: In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Scheme of Teaching and Examination 2018 – 19
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Common to Textile and Silk Technology Courses

VI SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P					
1	PCC	18TX61	Textile Fibre Physics	Textile	3	2	--	03	40	60	100	4
2	PCC	18TX62	Fabric Structure and Design-I	Textile	3	2	--	03	40	60	100	4
3	PCC	18TX63	Textile Testing-II	Textile	3	2	--	03	40	60	100	4
4	PEC	18TX64X	Professional Elective -1	Textile	3	--	--	03	40	60	100	3
5	PEC	18TX65X	Professional Elective -2	Textile	3	--	--	03	40	60	100	3
6	PCC	18TXL66	Fabric Structure and Design Lab-I	Textile	--	2	2	03	40	60	100	2
7	PCC	18TXL67	Textile Testing Lab-II	Textile	--	2	2	03	40	60	100	2
8	MP	18TXMP68	Mini-project	Textile	--	--	2	03	40	60	100	2
9	Internship	--	Internship	To be carried out during the vacation/s of VI and VII semesters and /or VII and VIII semesters.								
				TOTAL	**15**	**10**	**6**	**24**	**320**	**480**	**800**	**24**

Note: PCC: Professional core, PEC: Professional Elective, OE: Open Elective, MP: Mini-project.

Professional Elective -1

Course code under18XX64X	Course Title
18XX641	Sericulture and Silk Technology
18XX642	Erection and Maintenance of Textile Machinery
18XX643	Nano Textiles

Professional Elective -2

Course code under 18XX65X	Course Title
18TX651	Knitting and Non-Woven Technology
18TX652	Environmental Management in Textile Industry
18TX653	Financial Management

Mini-project work:
Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary Mini-project can be assigned to an individual student or to a group having not more than 4 students.

CIE procedure for Mini-project:

(i) Single discipline: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide.

The CIE marks awarded for the Mini-project work, shall be based on the evaluation of project report, project presentation skill and question and answer session in the ratio 50:25:25.The marks awarded for the project report shall be the same for all the batch mates.

(ii) Interdisciplinary: Continuous Internal Evaluation shall be group wise at the college level with the participation of all the guides of the college.

The CIE marks awarded for the Mini-project, shall be based on the evaluation of project report, project presentation skill and question and answer session in the ratio 50:25:25.The marks awarded for the project report shall be the same for all the batch mates.

SEE for Mini-project:

(i) Single discipline: Contribution to the Mini-project and the performance of each group member shall be assessed individually in the semester end examination (SEE) conducted at the department.

(ii) Interdisciplinary: Contribution to the Mini-project and the performance of each group member shall be assessed individually in semester end examination (SEE) conducted separately at the departments to which the student/s belongs to.

Internship: All the students admitted to III year of BE/B.Tech shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and /or VII and VIII semesters. A University examination shall be conducted during VIII semester and the prescribed credit shall be included in VIII semester. Internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not take-up/complete the internship shall be declared fail and shall have to complete during subsequent University examination after satisfying the internship requirements.

AICTE activity Points: In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Scheme of Teaching and Examination 2018 – 19
Outcome Based Education(OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2018 – 19)

Silk Technology

VII SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P					
1	PCC	18ST71	Structure and properties of silk	Textile	3	--	--	03	40	60	100	3
2	PCC	18TX72	Fabric Structure and Design-II	Textile	3	--	--	03	40	60	100	3
3	PCC	18TX73	Fashion Design and Garment Manufacture	Textile	3	--	--	03	40	60	100	3
4	PEC	18TX74X	Professional Elective – 3	Textile	3	--	--	03	40	60	100	3
5	PEC	18TX75X	Professional Elective - 4	Textile	3	--	--	03	40	60	100	3
6	PCC	18STL76	Silk Reeling Technology Lab	Textile	--	2	2	03	40	60	100	2
7	PCC	18TXL77	Fashion Design and Garment Manufacture Lab	Textile	--	2	2	03	40	60	100	2
7	Project	18TXP78	Project Work Phase - 1	Textile	--	--	2	--	100	--	100	1
8	Internship	--	Internship	(If not completed during the vacation of VI and VII semesters, it shall be carried out during the vacation of VII and VIII semesters)								
				TOTAL	**15**	4	**6**	**21**	**380**	**420**	**800**	**20**

Note: PCC: Professional core, PEC: Professional Elective.

Professional Elective - 3

Course code under 18XX73X	Course Title
18TX741	Industrial Engineering
18TX742	Fibre Reinforced Composites
18TX743	Smart Textiles

Professional Electives - 4

Course code under 18XX74X	Course Title
18TX751	Total Quality Management
18TX752	Retail Management
18ST753	Silk Apparel Marketing and Merchandising

Project work:
Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinaryproject can be assigned to an individual student or to a group having not more than 4 students. In extraordinary cases, like the funded projects requiring students from different disciplines, the project student strength can be 5 or 6.

CIE procedure for Project Work Phase - 1:

(i) Single discipline: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide.

The CIE marks awarded for the project work phase -1, shall be based on the evaluation of the project work phase -1 Report, project presentation skill and question and answer session in the ratio 50:25:25.The marks awarded for the Project report shall be the same for all the batch mates.

(ii) Interdisciplinary: Continuous Internal Evaluation shall be group wise at the college level with the participation of all guides of the college. Participation of external guide/s, if any, is desirable.

The CIE marks awarded for the project work phase -1, shall be based on the evaluation of project work phase -1 Report, project presentation skill and question and answer session in the ratio 50:25:25.The marks awarded for the project report shall be the same for all the batch mates.

Internship: All the students admitted to III year of BE/B.Tech shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and /or VII and VIII semesters. A University examination shall be conducted during VIII semester and the prescribed credit shall be included in VIII semester. Internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not take-up/complete the internship shall be declared fail and shall have to complete during subsequent University examination after satisfying the internship requirements.

AICTE activity Points: In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI
Scheme of Teaching and Examination 2018 – 19
Outcome Based Education(OBE) and Choice Based Credit System (CBCS)
(Effective from the academic year 2018 – 19)

Silk Technology

VIII SEMESTER

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination				Credits
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks	Total Marks	
					L	T	P					
1	PCC	18TX81	Apparel Testing and Quality Control	Textile	3	--	--	03	40	60	100	3
2	PEC	18TX82X	Professional Elective - 5	Textile	3	--	--	03	40	60	100	3
3	Project	18TXP83	Project Work Phase - 2	Textile	--	--	2	03	40	60	100	8
4	Seminar	18TXS84	Technical Seminar	Textile	--	--	2	03	100	--	100	1
5	Internship	18TXI85	Internship	Completed during the vacation/s of VI and VII semesters and /or VII and VIII semesters.)				03	40	60	100	3
				TOTAL	**06**	**--**	**4**	**15**	**260**	**240**	**500**	**18**

Note: PCC: Professional Core, PEC: Professional Elective.

Professional Electives - 5

Course code under 18XX82X	Course Title
18TX821	Human Resource Management
18ST822	Non Mulberry Silks and Silk Bi-Product Technology
18TX823	Technical Textiles

Project Work

CIE procedure for Project Work Phase - 2:

(i) Single discipline: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide.

The CIE marks awarded for the project work phase -2, shall be based on the evaluation of project work phase -2 Report, project presentation skill and question and answer session in the ratio 50:25:25.The marks awarded for the project report shall be the same for all the batch mates.

(ii) Interdisciplinary: Continuous Internal Evaluation shall be group wise at the college level with the participation of all guides of the college. Participation of external guide/s, if any, is desirable.

The CIE marks awarded for the project work phase -2, shall be based on the evaluation of project work phase -2 Report, project presentation skill and question and answer session in the ratio 50:25:25.The marks awarded for the project report shall be the same for all the batch mates.

SEE for Project Work Phase - 2:

(i) Single discipline: Contribution to the project and the performance of each group member shall be assessed individually in semester end examination (SEE) conducted at the department.

(ii) Interdisciplinary: Contribution to the project and the performance of each group member shall be assessed individually in semester end examination (SEE) conducted separately at the departments to which the student/s belong to.

Internship: Those, who have not pursued /completed the internship shall be declared as fail and have to complete during subsequent University examination after satisfying the internship requirements.

AICTE activity Points: In case students fail to earn the prescribed activity Points, Eighth semester Grade Card shall be issued only after earning the required activity Points. Students shall be admitted for the award of degree only after the release of the Eighth semester Grade Card.

Activity points of the students who have earned the prescribed AICTE activity Points shall be sent the University along with the CIE marks of 8th semester. In case of students who have not satisfied the AICTE activity Points at the end of eighth semester, the column under activity Points shall be marked NSAP (Not Satisfied Activity Points).

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

Scheme of Teaching and Examination and Syllabus

B.TECH. (SILK TECHNOLOGY)

III - VIII SEMESTER

(Effective from Academic year 2018-19)

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - III

STATISTICAL APPLICATIONS TO TEXTILES

Course Code	**18TX31**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:2:0)	SEE Marks	60
Credits	04	Exam Hours	03

Course Learning Objectives:

This Course aims at updating knowledge of students in following fields of statistical quality control

- Concepts of statistics and quality control
- Analyse the data, use suitable statistical tool to draw suitable conclusions
- Comparing different processes, parameters etc. for quality control

Module-1

The concept of individual population and samples-Frequency distribution and its representation-Construction of frequency diagrams with applications, probability curves.
Statistical measures and their practical applications. Measures of central tendency-different types of means, Measures of dispersion. Skewness, kurtosis

Module-2

Random sampling errors, relations between samples and populations, confidence interval. Determination CI for means, SD and difference in mean and SD. The normal distribution, binomial and Poisson distributions.

Module-3

Control charts, their uses and limitations in control of quality, concept of control limits, specification limits, ẊR, P, nP and C chart.
Time series, setting up of trend line, components of time series trend line by straight line quadratic and exponential method.

Module-4

Test of significance. Setting up of hypothesis. Significant tests for means and dispersions, chi- square test.

Module-5

Analysis of variance-One way & two ways. Correlation and Correlation co- efficient. Regression Analysis.

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

- This course work prepares students to work in quality control department of spinning, weaving and garment manufacturing
- This course work prepares students to analyze the data during their project work and case studies.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl. No.	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**Textile Testing**	J.E. Booth	CBS Publishers	1996
2	**Handbook of Textile Testing and Quality control**	Hamby Grower	Wiley Eastern Pvt. Ltd	1969
Reference Books				
3	**Statistics For Textile Technologists**	L.H. C. Tippet	Textile Institute	1973

4	**A Textbook of statistics**	Rajamohan	Benaka Books Udupi.	1995
5	**Practical Statistics for Textile Industry**	Gave-Leaf	Textile Institute	1984

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - III

TEXTILE FIBRES

Course Code	**18TX32**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:2:0)	SEE Marks	60
Credits	04	Exam Hours	03

Course Learning Objectives:
The course will enable students to:

- Recall, Recognize & Analyse the basic textile fibres.
- Recall, Recognize & Analyse, plan basics of textile fibre and are introduced with different types of natural and manmade (regenerated) fibres. Origin, History, properties and various aspects of textile fibres are taught in this subject.

Module-1

Brief history on origin of textiles. Introduction to textile fibres and essential requirements of textile fibres. Classification of textile fibres.

Cotton fibres – Origin, History, Cultivation, Grading of cotton fibre, Physical and Chemical properties of cotton fibres, Brief introduction to Bt, organic and coloured cotton.

Module-2

Protein fibres: - Introduction to natural protein fibres. Study of life cycle of Silk worm. Extraction of silk fibre, properties of silk fibre, Special features of silk fibre, Different verities of silk yarns and brief introduction to wild silk, Wool – origin, different types of wool, grading of wool, properties of wool fibres.

Module-3

Bast fibres **–** Introduction, Types of bast fibres, Method of extraction of bast fibres, Physical & Chemical properties of major bast fibres like Jute, Ramie flax fibres. Introduction to coir, hemp and banana fibres. Flow chart for the conversion of cotton, silk and Wool fibres to yarn and fabric.

Module-4

Introduction to manufactured fibres. Types of manufactured fibres, comparison of manufactured fibres with natural fibres. Concept of manufactured fibres spinning, Spinnability concept of polymeric fluids. Brief out line on melt, dry and wet spinning. Comparison of these spinning methods. Process variables in melt spinning. Instabilities in melt spinning. Speeds of melt spinning. Brief outline on special shaped fibres, micro denier, ultrafine and Nano fibres. Spin finish applications- objectives, formulations and methods of application.

Module-5

Regenerated fibres - types of regenerated fibres, Chemistry and production of regular Viscose rayon, Di-acetate, Tri acetate, Cuprammonium and Eco-friendly rayon fibres. Studies on modification of viscose rayon. Studies on regenerated Bamboo fibres. India's position in natural and manufactured fibres in global scenario.

Course Outcomes: At the end of the course the student will be able to:
On completion of this course, Students will be able to

- Recall & Recognize about fundamentals concepts of textiles products and textile industry.
- Recognize &Analyze, Apply, the problems associated with the fibres while working in textile industry

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**Hand book of Textile fibre**	Cook J	Marrow Wat Ford	1998
2	**Handbook of natural fibres**	R.M.Kozlowski	Wood-Head	2012.
3	**Introduction to textile fibres.**	H.V. Srinivas Murthy.	Wood-Head	2015
Reference Books				
4	**Manufactured fibre technology**	Gupta V.B, Kothari V.K	Chapman Hall	1997
5	**Formation of synthetic fibres**	Walczalk.K	Gordon & Sci. London	1977.
6	**High speed fibre spinning**	Ziabicki A	Wiley and sons, N.Y	1985

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - III

SPINNING TECHNOLOGY – I

Course Code	**18TX33**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:
The objective of this Course is to describe:

The basic spinning processes in Textile Industry and to understand the various spinning operations such as Blow Room, Carding and combing. Students acquire theoretical knowledge about the machineries used.

Module-1

Importance and need of Ginning. Explanation of working of different types of gins. Defects, causes and remedies of ginning. Baling process and bale weights Impurities in the cotton and remedies to minimize impurities in cotton. Important cotton types and trash in those cottons**.** Grading of cottons

Definition and objects of mixing and blending. Types of blending and common blends. Influence of fibre parameters namely length, fineness, strength, elongation, chemical deposits and neps on spinning performance.

Module-2

Objects of Blow room and identification of its components. Types of opening action in blow room. Brief study of bale pluckers and bale grabbers. Study of design features and different types of openers and beaters on the present day Blow room. Modern developments in Blow room.

Evaluation of Blow room performance - Hank calculation, production and efficiency calculation. Process modification required in blow room to process blends of Polyester/cotton and polyester/viscose. Study of blow room line required for processing different types of blends.

Module-3

Definition and objects of revolving flat card. Study of design features and different types of clothing on licker in, cylinder and doffer and their specifications. Passage of material through revolving flat card. Auto leveller on card and its importance. Types of auto leveller, Setting of different parts of card and gauges used for setting. Definition of draft in card and study of different types of draft and its calculation. Objects of stripping and grinding and their importance. Modern developments and salient features of modern cards. List out specification of the present day cards. Calculation of hank of sliver, production and efficiency in carding.

Module-4

Objects and principle of draw frame. Study of different drafting systems through sketches and name the types of draft in the drafting zone. Types of loading systems. Roller setting and procedure of roller setting. Auto levelers on draw frame. Study of long and short creel draw-frames and their advantages and limitations. Brief study on bercolisation, scouring, buffing, roller eccentricity, shore hardness, calculations of draw frame such as production

Module-5

Modern developments in draw frame and specifications of the present day draw frame. Hook theory and preparatory processes to comber. Objects of combing and study of combing cycle with the help of sketches and also index numbers. Detachment setting and its importance. Gauges used for setting the comber. Calculations in comber. Modern developments at comber and salient features of the present day comber.

Course Outcomes: At the end of the course the student will be able to:
On completion of this course, Students will be able to

- Learn the various spinning processes carried
- Gain knowledge about the machinery and Process Parameters of Blow room and Carding, combing
- Will be able to define the basics of spinning Technology

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**Manual of Cotton Spinning**	Coulson	Textile Institute, Manchester	1958
2	**Series on Textile processing**	Zaloski. S	Institute of Textiles Technology USA	1983
3	**Technology of short-staple spinning**	Klein. W	Textile Institute Pub., Manchester	1989
4	**Spun Yarn Technology**	Oxatoby	Butterworths, London	1987.
Reference Books				
5	**Contemporary Textile Engineering**	Happey. F	Academic Press Inc	1981.
6	**Cotton Spinning Calculations**	Pattabhiraman. T.K	Soumya Pub., Bombay	1979
7	**Cotton Opening & Carding**	Merril G.R	G.R. Merill, Lowell Mass	1955
8	**Blowroom and carding**	---	NCUTE	2000

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - III

WEAVING TECHNOLOGY – I

Course Code	**18TX34**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:

- Recall & Recognize warp & weft preparation
- Recognize &Demonstrate Principles of winding Techniques, yarn clearers, tensioning devices and settings features of autoconers.
- Recall & Recognize & Demonstrate Systems of warping :, size formulations cooking m/c, Weft preparation, pirn winding m/cs
- Define, Recognize & Demonstrate Sizing Ingredients, size controls in sow box etc.
- Recognize, apply & analyse Modern concepts of sizing
- Recognize & Demonstrate Post sizing operations.

Module-1

Necessity and sequence of operations in warp and weft preparation. Different types of supply and end packages. Objects and principles of winding. Classification of winding machines. Derivation of expression to find winding speed and surface speed, cone angle, coil angle and angle of wind and their importance. Types of balloon breakers. Yarn clearers and tensioning devices. Different types and their settings, gain, knot factor, clearing efficiency.

Module-2

Uster classimat and its usefulness in selecting optimum clearing. Classification of auto winding machines. Different types of auto winding machines. Salient features of Autoconer, Uniconer, and Schlrofhast B.C Spooler etc. Winding faults - causes and remedies. Identification of cones, material handling, measurement of package density.

Module-3

Objects and systems of warping. Study of different types of modern creels. Study of modern friction driven and spindle driven beam warping machines. Study of different types of sectional warping machines and their salient features. Special warpers for polyolefin filament yarns. Special requirements of yarn preparatory for shuttle less weaving machines. Production calculation of all machines. Introduction to weft preparation/spindle & spindle less weft winders. Study of different types of weft winding machines. Unifil loom winders/ Bobbin loaders.

Module-4

Objects of sizing. Study of Ingredients used for size preparation. Size formulation, study of mixing vessels such as pressure cookers, injection cookers, homogenizers, agitators and storing becks. Techniques of sizing, types of Sizing. Sizing recipes for natural fibres, man-made fibres and their blends. Salient features of modern sizing machines, creels and sow box.

Module-5

Drying principles – multi-cylinder drying, hot air drying, radiation drying. Size pickup, size add on. Concept of single-end sizing. Head stock - dry splitting, comb, drag roll. After waxing, cut mark motion, beam pressing. Controls in sow box - stretch and its control, moisture measurement and temperature control. Recent trends in sizing i.e. foam sizing, solvent sizing, hot melt sizing. High pressure squeezing, migrating behaviour of warp ends, dead loss, hard waste. Lappers, size defects and remedies. Post sizing operations - Drawing-in, leasing, knotting, automatic drawing in machine, gaiting-in technique.

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

- Recall & Recognize the necessity of warp & weft preparation
- Recall & Recognize & Demonstrate Winding operation, accessories of winding settings
- Recognize, Demonstrate & Analyze Winding m/cs their working features auto-winding machines
- Recognize & Demonstrate Warping m/c, different types, and different creels.
- Recognize, Demonstrate &Analyze Sizing concepts ingredients size cooking M/c, Saw box drying

principles controls

- Recall & Recognize &Analyze Post sizing operations.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**An Introduction to Winding and Warping**	Talukdar M K	Talukdar, Bombay Pvt. Circulation	
2	**Yarn preparation**	Sengupta R. – Vol I & II	Mahajan Pub. Ahmadabad	1970.
3	**Modern Preparation and weaving machinery**	Ormerod A.	Butterworth publication Co	1983
Reference Books				
4	**Cotton weaving**	Gordev V and Volkov P	Mir Pub. Moscow	1987
5	**Automatic Weaving**	Aitken	Colombia Press	1969
6	**Sizing Materials, Methods and Machines**	Ajgaonkar D B	Textiles trade press, Bombay	1982
7	**An Introduction to Automatic weaving**	Bennet G A	Columbia press, Manchester	1958

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - III

CHEMICAL PROCESSING OF TEXTILES – I

Course Code	**18TX35**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:

- This course aims at updating the knowledge of students in the following fields of chemical processing of textiles
- Basics of wet processing, sequences.
- Different preparatory process of singeing, desizing, scouring, bleaching and mercerization.
- Machineries used for various wet processing activities.
- Recent advances in wet processing activities.

Module-1

Introduction to processing operations and sequences Chemicals and auxiliaries used for textile wet processing and their functions. Introduction to shearing and cropping. Objects of shearing and cropping. Objects of singeing, methods of singeing, working of various singeing machines, latest developments in singeing

Module-2

Various desizing methods, Discussion on desizing - continuous desizing, desizing of cotton and other blends, latest developments in desizing. Objects of scouring, mechanism of scouring, methods of scouring, scouring of natural cellulose fabrics. Degumming of silk**, s**couring of wool and jute, scouring of synthetic fibres. Modifications required to scour knitted fabrics. Latest developments in scouring.

Module-3

Objects of bleaching, mechanism of bleaching and methods of bleaching. Bleaching of cellulosic fibres, natural protein fibres, common manufactured fibres and common fibre blends. Latest developments in bleaching. Objects of optical whitening, chemistry of optical whitening agents and optical whitening process for common fibres. Quality control methods for testing scoured and bleached materials and methods used for determination of degradation of cotton, during scouring and bleaching.

Module-4

Machines used for desizing, scouring and bleaching. Batch processes, semi continuous processes and continuous processes. Objects of mercerization, history and developments of Mercerization, physical and chemical changes in cotton due to mercerization, various factors affecting mercerization, degree or efficiency of mercerization

Module-5

Methods of mercerizing yarns and fabrics. Machines used for mercerization, taught and slack mercerization. Principle of hot mercerization. Test methods for mercerized fabrics. Latest developments in mercerization. Brief study on eco-friendly preparatory processes. Water and energy management in preparatory processes

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

- This subject helps the student to acquire knowledge of preparatory process of wet processing and pre preparatory process.
- This subject prepares the student work in chemical processing industry.
- Students are exposed to research field in chemical processing technology.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year

Textbook/s				
1	**Technology of Textile Processing-** Vol. III	A Shenai	Sevak Publications	1975
2	**Technology of Bleaching and Dyeing of textile fibres**	Chakraborthy,	Coxtown publications	1972
3	**Mercerization**	J T Marsh,	B I Publications	1979
4	**Scouring and Bleaching of Cotton**	J.T. Marsh	B I Publications	1979
5	**Dyeing and Chemical Technology of textile Fibres**	E.R.Trotman	John Wiley & Sons Inc	1985
6	**Chemical Technology in the Pre-Treatment Processes of Textiles**	Karmakar S.R	Elsevier, NY	1999
7	**Textile Preparation and Dyeing**	A.K.Roy Choudhury	SDC., India	2006
Reference Books				
8	**Chemical Processing of Textiles-Preparatory, Processing and Dyeing**	Dr.C.V.Koushik Mr.Antao Irwin Josico	NCUTE, IIT, New Delhi	2003
9	**Textile Auxiliaries and Finishing Chemicals**	R.C.Vora	ATIRA Publications	1975
10	**Recent processes of Textile Bleaching, Dyeing and Finishing**	S B Srivastava	SBP Publications.	1978

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - III

SPINNING TECHNOLOGY LAB - I

Course Code	**18TXL36**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(0:2:2)	SEE Marks	60
Credits	02	Exam Hours	03

Course Learning Objectives:

The objective of this Course is to describe the basic Practical spinning process of Textile Machineries such as Blow Room, Carding. Students acquire the practical knowledge about the machineries used.

Sl. No.	Experiments
1	**Blow Room:** Passage of material through the blow room and different openers and beaters of blow room. Selection of beating points and study of their design features and to evaluate their efficiencies
2	Driving arrangements and demonstration of all machineries and calculations of speeds of different parts of each machineries
3	Calculation of cleaning efficiency at all beaters and openers. Working on Trash Analyser and related Calculations
4	Study of piano feed regulating motion and calculation of cone drum speed, feed Roller speed and beats/inch.
5	Production and CV% calculation in Blow Room laps (within and between).
6	Identification of Blow Room process for different mixings, impurities and counts.
7	**Carding:** Explanation of Passage of material through revolving flat card.
8	Speed and draft calculation of different parts of carding with the help of gearing and driving
9	Draft constant and its calculation.
10	Draft change pinion calculation and machine operation to get different hank of slivers.
11	Calculation on snap study to analyse neps, sliver variations and efficiency
12	Settings of different parts and gauges used setup the machines
13	Comparison between conventional and modern high speed card with respect to production, efficiency and quality of sliver.
14	Hank and CV calculation of sliver.
15	**Draw Frame:** Passage of material through draw frame and list the parts and their functions.
16	Different types of drafting system and describe salient features of modern draw frames
17	Break draft, main draft and total draft calculation.
18	Production, delivery speed, calculation of hank of sliver, efficiency calculation of draw frame
19	Setting of drafting zone and processing of material as per the hank required
20	**Comber:** Study of preparatory machines to comber. Study of one cycle of combing. Detachment setting and its importance. Setting of comber parts with the help of index numbers.
21	Production, speed, efficiency, draft calculation of comber
22	Working on comber. Demonstration of comber working

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

On completion of this course, Students will be able to

1. Learn the practical aspects of the machineries used
2. Gain knowledge about the process parameters such as Settings, Speeds of Blow room and Carding
3. Will be able to define the actual running of the machineries

Conduct of Practical Examination:

1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - III

WEAVING TECHNOLOGY LAB-I

Course Code	**18TXL37**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(0:2:2)	SEE Marks	60
Credits	02	Exam Hours	03

Course Learning Objectives:

- Recall & Recognize the features passage, production calculation & efficiency of hank winding m/c, cone winding m/c.
- Recall, Recognize & Analyse the non-auto& auto pirn winding, bunch building production and efficiency calculations
- Recognize & Demonstrate Production and efficiency warping machines like Beam and sectional warping machines.
- Recall, Recognize Sizing machine: passage through sow box drying equipment's, head stock
- Recall, Recognize Weft preparation auto & non-auto winding m/c.
- Recognize & Demonstrate & Calculate Production and efficiency calculations.
- Recognize & Demonstrate Drawing - in and denting operations.

Sl. No	Experiments
1	Passage of material through hank winding machine Speed, production and efficiency calculations
2	Working on double flanged bobbin winder. Speed, production and efficiency calculations of double flanged winding machine
3	Passage of material through non-automatic and automatic winding machines. Study of the salient features, speed, production and efficiency calculations
4	Setting of Tensioners and Slub catchers on winding machine.
5	Passage of material through non-auto pirn winding machine. Adjusting the bunch length, speed, production and efficiency calculations
6	Passage of material through automatic pirn winding machine. Adjusting the bunch length, speed, production and efficiency calculations
7	Passage of material through sectional warping machine. Calculation of machine
8	Passage of material through Beam warping machine. Calculations related to speed, production and efficiency
9	Passage of material through sizing machine. Calculations related to speed, production and efficiency
10	Plan of warp patterns for stripes and check fabrics
11	Preparation of warp on sectional warping machine and related calculations
12	Study of different types of sizing ingredients, cooking and mixing beck
13	Knotting, drawing - in and denting of weavers beam
14	Identification, reasons and remedies for defects in pirn winding, warping and sizing

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

- Recognize & Demonstrate working of yarn preparatory machines like hank winding, cone winding warping and weft winding machines:
- Recognize, apply & calculate the production and efficiency of preparatory machines.
- Recognize & Demonstrate Sizing machine construction & working, drying of warp and head stock
- Recognize, apply& Demonstrate Drawing - in and denting operations, gaiting techniques.

Conduct of Practical Examination:

1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - III

CHEMICAL PROCESSING OF TEXTILES LAB - I

Course Code	**18TXL38**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(0:2:2)	SEE Marks	60
Credits	02	Exam Hours	03

Course Learning Objectives:

- This subject aims to acquire knowledge of various chemical preparatory processes of textiles.
- Practical knowledge on preparatory processes, to bring more confidence in students and they are exposed to different machineries, recipes and process control.
- Knowledge on recent developments, eco-friendly process.

Sl. No	Experiments
1	Desizing of cotton yarn/fabric using acids.
2	Desizing of cotton yarn/fabric using enzymes (amylases).
3	Scouring of cotton using alkali method and determination of scouring loss
4	Degumming of silk using soap-soda/enzymatic methods and determination of degumming loss
5	Scouring of Wool fibres and determination of scouring loss
6	Scouring of Jute fibres determination of scouring loss
7	Bleaching of cotton using bleaching powder and Sodium hypochlorite
8	Bleaching of cotton using Hydrogen Peroxide
9	Bleaching of silk and woollen goods
10	Bleaching of Jute fibres/fabrics
11	Optical whitening of bleached goods
12	Mercerization of cotton in taught and slack forms
13	Determination of scouring/bleaching efficiency using cuprammonium fluidity, methylene blue absorption etc
14	Determination of efficiency of mercerized goods using BAN and strength measurements.

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

- This course helps the students to acquire practical knowledge of various chemical preparatory processes.
- Students are exposed to process control, chemicals and auxiliaries used, machineries.
- This subject prepare the students work in various chemical industries.

Conduct of Practical Examination:

1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

B. E. (Common to all Programmes)
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER –II / III / IV

Aadalitha Kannada

Course Code	**18KAK28/39/49**	CIE Marks	100
Teaching Hours/Week (L:T:P)	(0:2:0)		
Credits	01		

ಆಡಳಿತ ಕನ್ನಡ ಕಲಿಕೆಯ ಉದ್ದೇಶಗಳು:

- ಪದವಿ ವಿದ್ಯಾರ್ಥಿಳಾಗಿರುವುದರಿಂದ ಆಡಳಿತ ಕನ್ನಡದ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.
- ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಕನ್ನಡ ಭಾಷೆಯ ವ್ಯಾಕರಣದ ಬಗ್ಗೆ ಅರಿವು ಮೂಡಿಸುವುದು.
- ಕನ್ನಡ ಭಾಷಾ ರಚನೆಯಲ್ಲಿನ ನಿಯಮಗಳನ್ನು ಪರಿಚಯಿಸುವುದು.
- ಕನ್ನಡ ಭಾಷಾ ಬರಹದಲ್ಲಿ ಕಂಡುಬರುವ ದೋಷಗಳು ಹಾಗೂ ಅವುಗಳ ನಿವಾರಣೆ. ಮತ್ತು ಲೇಖನ ಚಿಹ್ನೆಗಳನ್ನು ಪರಿಚಯಿಸುವುದು.
- ಸಾಮಾನ್ಯ ಅರ್ಜಿಗಳು, ಸರ್ಕಾರಿ ಮತ್ತು ಅರೆ ಸರ್ಕಾರಿ ಪತ್ರವ್ಯವಹಾರದ ಬಗ್ಗೆ ಅರಿವು ಮೂಡಿಸುವುದು.
- ಭಾಷಾಂತರ ಮತ್ತು ಪ್ರಬಂಧ ರಚನೆ ಬಗ್ಗೆ ಅಸಕ್ತಿ ಮೂಡಿಸುವುದು.
- ಕನ್ನಡ ಭಾಷಾಭ್ಯಾಸ ಮತ್ತು ಸಾಮಾನ್ಯ ಕನ್ನಡ ಹಾಗೂ ಆಡಳಿತ ಕನ್ನಡದ ಪದಗಳ ಪರಿಚಯ ಮಾಡಿಕೊಡುವುದು.

ಪರಿವಿಡಿ (ಪಠ್ಯಪುಸ್ತಕದಲ್ಲಿರುವ ವಿಷಯಗಳ ಪಟ್ಟಿ)

ಅಧ್ಯಾಯ – 1 ಕನ್ನಡಭಾಷೆ – ಸಂಕ್ಷಿಪ್ತ ವಿವರಣೆ.
ಅಧ್ಯಾಯ – 2 ಭಾಷಾ ಪ್ರಯೋಗದಲ್ಲಾಗುವ ಲೋಪದೋಷಗಳು ಮತ್ತು ಅವುಗಳ ನಿವಾರಣೆ.
ಅಧ್ಯಾಯ – 3 ಲೇಖನ ಚಿಹ್ನೆಗಳು ಮತ್ತು ಅವುಗಳ ಉಪಯೋಗ.
ಅಧ್ಯಾಯ – 4 ಪತ್ರ ವ್ಯವಹಾರ.
ಅಧ್ಯಾಯ – 5 ಆಡಳಿತ ಪತ್ರಗಳು.
ಅಧ್ಯಾಯ – 6 ಸರ್ಕಾರದ ಆದೇಶ ಪತ್ರಗಳು.
ಅಧ್ಯಾಯ – 7 ಸಂಕ್ಷಿಪ್ತ ಪ್ರಬಂಧ ರಚನೆ (ಪ್ರಿಸೈಸ್ ರೈಟಿಂಗ್), ಪ್ರಬಂಧ ಮತ್ತು ಭಾಷಾಂತರ.
ಅಧ್ಯಾಯ – 8 ಕನ್ನಡ ಶಬ್ದಸಂಗ್ರಹ.
ಅಧ್ಯಾಯ – 9 ಕಂಪ್ಯೂಟರ್ ಹಾಗೂ ಮಾಹಿತಿ ತಂತ್ರಜ್ಞಾನ.
ಅಧ್ಯಾಯ – 10 ಪಾರಿಭಾಷಿಕ ಆಡಳಿತ ಕನ್ನಡ ಪದಗಳು ಮತ್ತು ತಾಂತ್ರಿಕ/ ಕಂಪ್ಯೂಟರ್ ಪಾರಿಭಾಷಿಕ ಪದಗಳು.

ಆಡಳಿತ ಕನ್ನಡ ಕಲಿಕೆಯ ಫಲಿತಾಂಶಗಳು:

- ಆಡಳಿತ ಭಾಷೆ ಕನ್ನಡದ ಪರಿಚಯವಾಗುತ್ತದೆ.
- ವಿದ್ಯಾರ್ಥಿಗಳಲ್ಲಿ ಕನ್ನಡ ಭಾಷೆಯ ವ್ಯಾಕರಣದ ಬಗ್ಗೆ ಅರಿವು ಮೂಡುತ್ತದೆ.
- ಕನ್ನಡ ಭಾಷಾ ರಚನೆಯಲ್ಲಿನ ನಿಯಮಗಳು ಮತ್ತು ಲೇಖನ ಚಿಹ್ನೆಗಳು ಪರಿಚಯಿಸಲ್ಪಡುತ್ತವೆ.
- ಸಾಮಾನ್ಯ ಅರ್ಜಿಗಳು, ಸರ್ಕಾರಿ ಮತ್ತು ಅರೆ ಸರ್ಕಾರಿ ಪತ್ರವ್ಯವಹಾರದ ಬಗ್ಗೆ ಅರಿವು ಮೂಡುತ್ತದೆ.
- ಭಾಷಾಂತರ ಮತ್ತು ಪ್ರಬಂಧ ರಚನೆ ಬಗ್ಗೆ ಅಸಕ್ತಿ ಮೂಡುತ್ತದೆ.
- ಕನ್ನಡ ಭಾಷಾಭ್ಯಾಸ ಮತ್ತು ಸಾಮಾನ್ಯ ಕನ್ನಡ ಹಾಗೂ ಆಡಳಿತ ಕನ್ನಡದ ಪದಗಳು ಪರಿಚಯಿಸಲ್ಪಡುತ್ತವೆ.

ಪರೀಕ್ಷೆಯ ವಿಧಾನ : ನಿರಂತರ ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನ – ಅಖಇ **(ಅಡಟಿಣಟಿಣಞಾ ಖಟಿಣಜಡಿಟಿಚಿಟ ಇಞಚಿಟಣಚಿಣಞಟಿ):**
ಕಾಲೇಜು ಮಟ್ಟದಲ್ಲಿಯೆ ಆಂತರಿಕ ಪರೀಕ್ಷೆಯನ್ನು 100 ಅಂಕಗಳಿಗೆ ವಿಶ್ವವಿದ್ಯಾಲಯದ ನಿಯಮಗಳು ಮತ್ತು ನಿರ್ದೇಶನದಂತೆ ನಡೆಸತಕ್ಕದ್ದು.

ಪಠ್ಯಪುಸ್ತಕ : ಆಡಳಿತ ಕನ್ನಡ ಪಠ್ಯ ಪುಸ್ತಕ (ಎಚಿಟಿಟಚಿಜಚಿ ಜಿಡಿಡಿ ಂಜಟಿಟ್ಠೂಡಿಚಿಣಞಟಿ)
ಸಂಪಾದಕರು
ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ
ಪ್ರೊ. ವಿ. ಕೇಶವಮೂರ್ತಿ
ಪ್ರಕಟಣೆ : ಪ್ರಸಾರಾಂಗ, ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ.

B. E. (Common to all Programmes)
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER –II & III/IV

Vyavaharika Kannada

Course Code	**18KVK28/39/49**	CIE Marks	100
Teaching Hours/Week (L:T:P)	(0:2:0)		
Credits	01		

Course Learning Objectives:

The course will enable the students to understand Kannada and communicate in Kannada language.

Table of Contents:

Course Outcomes:

At the end of the course, the student will be able to understand Kannada and communicate in Kannada language.

ಪರೀಕ್ಷೆಯ ವಿಧಾನ : ನಿರಂತರ ಆಂತರಿಕ ಮೌಲ್ಯಮಾಪನ – ಅಖಇ **(ಅಂಟಿಣಟಿಣಾ ಖಟಿಣಜಿಟಿಚಿಟ ಇತಿಚಿಟಣಚಿಣಾಟಿ):**

ಕಾಲೇಜು ಮಟ್ಟದಲ್ಲಿಯೆ ಆಂತರಿಕ ಪರೀಕ್ಷೆಯನ್ನು 100 ಅಂಕಗಳಿಗೆ ವಿಶ್ವವಿದ್ಯಾಲಯದ ನಿಯಮಗಳು ಮತ್ತು ನಿರ್ದೇಶನದಂತೆ ನಡೆಸತಕ್ಕದ್ದು.

ಖಿಷಾಥಾಾ (ಪಠ್ಯಪುಸ್ತಕ): ವ್ಯಾವಹಾರಿಕ ಕನ್ನಡ ಪಠ್ಯ ಪುಸ್ತಕ (ಗಿಥಿಚಿತುಚಿಡಿಾಚಿ ಏಚಿಟಿಟಿಚಿಜಚಿ ಖಿಷಾ ಃಾ)

ಸಂಪಾದಕರು

ಡಾ. ಎಲ್. ತಿಮ್ಮೇಶ

ಪ್ರೊ. ವಿ. ಕೇಶವಮೂರ್ತಿ

ಪ್ರಕಟಣೆ : ಪ್ರಸಾರಾಂಗ, ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಬೆಳಗಾವಿ.

B.E. (Common to all Programmes)
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - III

Constitution of India, Professional Ethics and Cyber Law (CPC)
(Mandatory Learning Course: Common to All Programmes)

Course Code	**18CPC39/49**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(2:0:0)	SEE Marks	60
Credits	01	Exam Hours	02

Course Learning Objectives: This course will enable the students

- To know the fundamental political codes, structure, procedures, powers, and duties of Indian government institutions, fundamental rights, directive principles, and the duties of citizens
- To understand engineering ethics and their responsibilities, identify their individual roles and ethical responsibilities towards society.
- To know about the cybercrimes and cyber laws for cyber safety measures.

Module-1

Introduction to Indian Constitution:
The Necessity of the Constitution, The Societies before and after the Constitution adoption. Introduction to the Indian constitution, The Making of the Constitution, The Role of the Constituent Assembly - Preamble and Salient features of the Constitution of India. Fundamental Rights and its Restriction and limitations in different Complex Situations. Directive Principles of State Policy (DPSP) and its present relevance in our society with examples. Fundamental Duties and its Scope and significance in Nation building.

Module-2

Union Executive and State Executive:
Parliamentary System, Federal System, Centre-State Relations. Union Executive – President, Prime Minister, Union Cabinet, Parliament - LS and RS, Parliamentary Committees, Important Parliamentary Terminologies. Supreme Court of India, Judicial Reviews and Judicial Activism. State Executives – Governor, Chief Minister, State Cabinet, State Legislature, High Court and Subordinate Courts, Special Provisions (Articles 370.371,371J) for some States.

Module-3

Elections, Amendments and Emergency Provisions:
Elections, Electoral Process, and Election Commission of India, Election Laws. Amendments - Methods in Constitutional Amendments (How and Why) and Important Constitutional Amendments. Amendments – 7,9,10,12,42,44, 61, 73,74, ,75, 86, and 91,94,95,100,101,118 and some important Case Studies. Emergency Provisions, types of Emergencies and its consequences.

Constitutional special provisions:
Special Provisions for SC and ST, OBC, Women, Children and Backward Classes.

Module-4

Professional / Engineering Ethics:
Scope & Aims of Engineering & Professional Ethics - Business Ethics, Corporate Ethics, Personal Ethics. Engineering and Professionalism, Positive and Negative Faces of Engineering Ethics, Code of Ethics as defined in the website of Institution of Engineers (India): Profession, Professionalism, and Professional Responsibility. Clash of Ethics, Conflicts of Interest. Responsibilities in Engineering Responsibilities in Engineering and Engineering Standards, the impediments to Responsibility. Trust and Reliability in Engineering, IPRs (Intellectual Property Rights), Risks, Safety and liability in Engineering.

Module-5

Internet Laws, Cyber Crimes and Cyber Laws:
Internet and Need for Cyber Laws, Modes of Regulation of Internet, Types of cyber terror capability, Net neutrality, Types of Cyber Crimes, India and cyber law, Cyber Crimes and the information Technology Act 2000, Internet Censorship. Cybercrimes and enforcement agencies.

Course Outcomes: On completion of this course, students will be able to,

CO 1: Have constitutional knowledge and legal literacy.
CO 2: Understand Engineering and Professional ethics and responsibilities of Engineers.
CO 3: Understand the the cybercrimes and cyber laws for cyber safety measures.

Question paper pattern for SEE and CIE:

- The SEE question paper will be set for 100 marks and the marks scored by the students will proportionately be reduced to 60. The pattern of the question paper will be objective type (MCQ).

- For the award of 40 CIE marks, refer the University regulations 2018.

Textbook:

1. Shubham Singles, Charles E. Haries, and et al: **"Constitution of India, Professional Ethics and Human Rights"** by Cengage Learning India, Latest Edition – 2019.
2. Alfred Basta and et al: **"Cyber Security and Cyber Laws"** by Cengage Learning India - 2018. Chapter – 19, Page No's: 359 to 383.

Reference Books:

1. Durga Das Basu (DD Basu): "**Introduction to the Constitution of India**", (Students Edition.) Prentice –Hall, 2008.
2. M. Govindarajan, S. Natarajan, V. S. Senthilkumar, "**Engineering Ethics**", Prentice –Hall, 2004.

B.E.(Common to all Programmes)
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - III

ADDITIONAL MATHEMATICS – I

(Mandatory Learning Course: Common to All Programmes)
(A Bridge course for Lateral Entry students under Diploma quota to BE/B. Tech. programmes)

Course Code	**18MATDIP31**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(2:2:0)	SEE Marks	60
Credits	**0**	Exam Hours	03

Course Learning Objectives:

- To provide basic concepts of complex trigonometry, vector algebra, differential and integral calculus.
- To provide an insight into vector differentiation and first order ODE's.

Module-1

Complex Trigonometry: Complex Numbers: Definitions and properties. Modulus and amplitude of a complex number, Argand's diagram, De-Moivre's theorem (without proof).
Vector Algebra: Scalar and vectors. Addition and subtraction and multiplication of vectors- Dot and Cross products, problems.

Module-2

Differential Calculus: Review of successive differentiation-illustrative examples. Maclaurin's series expansions-Illustrative examples. Partial Differentiation: Euler's theorem-problems on first order derivatives only. Total derivatives-differentiation of composite functions. Jacobians of order two-Problems.

Module-3

Vector Differentiation: Differentiation of vector functions. Velocity and acceleration of a particle moving on a space curve. Scalar and vector point functions. Gradient, Divergence, Curl-simple problems. Solenoidal and irrotational vector fields-Problems.

Module-4

Integral Calculus: Review of elementary integral calculus. Reduction formulae for $\sin^n x$, $\cos^n x$ (with proof) and $\sin^m x \cos^n x$ (without proof) and evaluation of these with standard limits-Examples. Double and triple integrals-Simple examples.

Module-5

Ordinary differential equations (ODE's. Introduction-solutions of first order and first-degree differential equations: exact, linear differential equations. Equations reducible to exact and Bernoulli's equation.

Course outcomes: At the end of the course the student will be able to:

- CO1: Apply concepts of complex numbers and vector algebra to analyze the problems arising in related area.
- CO2: Use derivatives and partial derivatives to calculate rate of change of multivariate functions.
- CO3: Analyze position, velocity and acceleration in two and three dimensions of vector valued functions.
- CO4: Learn techniques of integration including the evaluation of double and triple integrals.
- CO5: Identify and solve first order ordinary differential equations.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks.
- Each full question will be for 20 marks.
- There will be two full questions (with a maximum of four sub- questions) from each module.
- Each full question will have sub- question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
Textbook				

1	Higher Engineering Mathematics	B. S. Grewal	Khanna Publishers	43rd Edition, 2015
Reference Books				
1	Advanced Engineering Mathematics	E. Kreyszig	John Wiley & Sons	10th Edition, 2015
2	Engineering Mathematics	N. P .Bali and Manish Goyal	Laxmi Publishers	7th Edition, 2007
3	Engineering Mathematics Vol. I	Rohit Khurana	Cengage Learning	1st Edition, 2015

IV SEMESTER

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - IV

TEXTILE MECHANICS AND CALCULATIONS

Course Code	**18TX41**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:2:0)	SEE Marks	60
Credits	04	Exam Hours	03

Course Learning Objectives:

To make students to understand basic concepts of mathematics involved in textile technology.

This subject deals with major mathematical operations involved in textile technology.

Module-1

Conversion of units from one basic system to other basic system, Area and volume of regular and irregular shapes, Ratios, proportions, proportional division percentages – machine efficiency, running efficiency, overall efficiency, Application of elemental trigonometry for understanding yarn packages. Plotting of graphs w.r.t textile operations, law of graphs and integration of gradient of graph. Application of vectors in understanding parallelogram, triangle of force. Nomo grams.

Module-2

Fibbers: Calculation of length parameters from sorter diagram, weight distribution technique for length measurement. Relation between fineness and linear density. Calculation of linear density from diameter of fibre and use of proportionality in fineness calculation. Calculation of tenacity, elastic recovery, work of rapture, initial modulus, moisture regain, moisture content and moisture swelling of fibres. Definition and calculation of denier and Tex of the filament using melt spinning variables, definition of trash and lint content in raw cotton.

Module-3

Basic kinematics, The equations of motion, motion in a circle, Frictional drives, Chain and sprocket drives, driving by gears, planetary mechanisms, Draft calculation in yarn production, different types of drafts, Winding calculation in speed frame, ring frames. Production calculations in yarn spinning, determination of twist in roving, ring spinning, and OE spinning yarn. Yarn numbering, conversion of count from one system to other system, resultant count, no.of fibers in yarn cross section, yarn diameter, calculation related to CV of double yarn, calculation of average count.

Module-4

Calculations related to cone and cheese winding. Winding rate wind and traverse ratio; yarn tension calculations yarn clearer settings warp and warping calculations, calculation related to size percentage, size pickup, sizing machines speed, Efficiency calculation related to warp and weft. Weft consumption on a loom, pirn shape, cheese length, cheese angle, wind of pirn.

Module-5

Calculation on weaving machine, (both shuttle and shuttle less) Time required to weave a known length of fabric, warp length, required per loom, reed count, reed width, production calculation on different types of loom, fabric areal density calculations, fabric cover. Calculations w.r.t primary and secondary variation on loom, Loom efficiency, loom production. Geometry of plain weft and warp knitted fabrics. Calculation on thread consumption in garment industry. 4 and 10 point system of fabric inspection, calculation of AQL. Calculation of seam efficiency seam strength.

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

- Students will acquire knowledge in basic concepts of mathematics involved in textile operations.
- After acquiring knowledge in this subject, the students will be able to do all mathematical calculations during various operations of textile industry

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**Textile Mathematics Volume 1,2,3**	**J.E. Booth**	Textile Institute.	1975
2	**Textile Mechanics**	**Volume 1 & 2**	**Textile Institute**	1975
3	**Weaving calculations**	**Sengupta**	B. T. Taraporevala & sons	1982
Reference Books				
4	**Basic Textile Mathematics**	**A.K. Khare**	--	1980
5	**Hand book of Cotton Spinning**	William Taggart	Universal Publ. Corp	1979
6	**Essential Facts of Practical Cotton Spinning**	Pattabhiraman. T.K	Soumya Pub., Bombay	1979

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - IV

TEXTILE POLYMER SCIENCE

Course Code	**18TX42**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:2:0)	SEE Marks	60
Credits	04	Exam Hours	03

Course Learning Objectives:

- As the basic building block of all textile products is polymers, acquiring knowledge in this subject is necessary for all undergraduate Textile Technology students.
- This subject deals with basics of polymer science & Technology, general aspects of polymer production, polymer flow behaviour and polymer properties with emphasis given to polymer used for production of textile products.

Module-1

Introduction and definition of monomers and polymers. History and Classification of polymers. Characteristics of fibre forming polymers and their general applications. Study of synthesis of polymers by chain, step and co-ordination polymerization. Study of various types of initiators for addition polymerization.
Comparison of different types of polymerization methods

Module-2

Co-polymerization - Concept of co-polymerization, reactivity ratios in Co-polymerization. Kinetics of polymerization - estimation of kinetic chain length, illustration of effect of various parameters on kinetics of polymerization. Functionality in polymers. Carothers equation and extent of polymerization. Techniques of polymerization, comparison of various Techniques.

Module-3

Rheology of polymers - Newtonian and non-Newtonian Fluids. Basic equations related to fluid flow, capillary flow. Characteristics of polymeric solutions. Thermo dynamics of polymer solutions. Analysis of Mechanical and tensile behaviour of polymers. Time dependent mechanical and temperature dependent mechanical behaviour. Study of Maxwell's, Kelvin's & Burger's Models.

Module-4

Concepts of avg. molecular weight and molecular weight distribution. Determination of molecular weight of polymers using end group analysis, osmometry, viscometry and gel permeation chromatography. Importance of molecular weight. Molecular weight differences for fibres & plastics

Module-5

Chemistry of polymer degradation - various types of degradation - oxidative, mechanical, Photo and thermal degradation. Use of Inhibitors and anti-oxidants to control polymer degradation. Thermal analysis of polymers - glass transition temperature of polymers. Determination of glass transition temperature. Free volume concept. Study of thermal characterization by DSC, DTA, TGA and TMA

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

- Students will acquire knowledge in basic concepts of polymer Technology with special reference to Textile polymers.
- After acquiring knowledge in this subject, the students will be able to work in polymer production industry and research laboratory.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**Text book of polymer Science**	Billmeyer. W	Wiley Int. Sci	1984

2	**Polymer Science**	Gowarikar V.R., Vishwanathan N.V., JayadevSridhara	Wiley Eastern Ltd., New Delhi	1995
3	**Principles of polymerization**	Odian G., John	Wiley & sons, NY	1976
4	**Mechanical properties of polymers**	Ward I.M	Wiley & sons, NY	1971
Reference Books				
5	**Properties and structure of polymers**	Tobolski,	John Wiley & sons, NY	1960
6	**Mechanical Properties of polymers**	Nielson L.E	Marshal Dekkar	1974
7	**Polymer characterization**	Cambel and White	Chapman& Hall, London	1985

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - IV

SPINNING TECHNOLOGY - II

Course Code	**18TX43**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:
The objective of this Course is to explain the students the basic spinning process in Textile Industry such as Speed frame ring frame, doubling, rotor and unconventional spinning techniques. Students will acquire theoretical knowledge about the machineries used.

Module-1

Objects of speed frame, study of different drafting systems and importance of apron drafting system. Principle of twisting and winding in speed frame. Study of different types of flyers, building mechanism, lift, chase length and their importance. Study of differential gearing mechanism and its importance. Different types of change point at speed frame. Modern developments in speed frame and salient features of the modern speed frame.

Module-2

Objects of ring spinning, study of different drafting systems and type importance. Principles of twisting, factors affecting the twist Calculation, Difference between Actual and Practical TPI. Principal of winding. Types of builts Roller setting, draft and its calculation. Rings and Travellers. Different types of rings, selection of rings and manufacture of rings. Types of travellers, traveller numbering both in direct and indirect system. Manufacture of travellers.

Module-3

Forces acting on traveller. Faulty packages of Ring frame and remedial measures. Modern developments of Ring frame and salient features of the present day ring frame. Calculations of Ring frame such as production, efficiency, Traveller speed and count etc.

Doubling frame – objects of doubling and conditions to get balanced double yarn. Preparation of doubling, Types of doubling systems. Study of Two for one twister. Threading through different types of wet doubling systems. Defects in doubling and remedies Study of Types of Sewing threads and their applications.

Module-4

Open-end spinning – principle and objects of open-end spinning. Classification of open-end spinning. Principle and Technique of rotor spinning and detailed study of rotor spinning such as initial drafting, transport zone, twisting and yarns formation Types of opening rollers and rotors and their effect on the performance of OE machine.

Calculations of Open end spinning machines. Modern developments in OE machine.

Module-5

Fancy yarns and their production and applications.

Study of Advanced Spinning systems such as DREF spinning, Air jet spinning, Twist less spinning, Bob-Tex Spinning, Core and Cover spun yarn spinning.

Quality studies of all unconventional methods of spinning. Comparison between conventional and unconventional methods of spinning.

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

- Learn the various spinning processes carried
- Gain knowledge about the machinery and Process Parameters of Draw Frame, Comber and Speed Frame
- Will be able to describe the basics of spinning Technology

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.

Sl. No..	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**Manual of Cotton Spinning**	Coulson. A.F.W.(Ed.), Vol. I to IV	Textile Institute, Manchester,1958	1958
2	**Series on Textile processing**	Zaloski.S	The Institute of Textile Technology, USA	1983
3	**Technology of short-staple spinning**	Klein.W.,Vol.I, II, III and IV	Textile Institute Pub., Manchester	1989
4	**Spun Yarn Technology**	Oxtoby	Butterworths, London	1987
Reference Books				
5	**Contemporary Textile Engineering**	Happy. F. (Ed.),	Academic Press, Inc	1981
6	**Hand Book of Cotton Spinning**	Taggart William	Universal Pub. Cor	1979
7	**Essential Facts of Practical cotton spinning**	Pattabhiraman T.K	Soumya Pub., Bombay	1979
8	**Cotton Spinning Calculation**		Soumya Pub., Bombay	1979
9	**Cotton Opening & Carding**	Merril. G.R.	G.R. Merril, Lowell Mass	1955

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - IV

WEAVING TECHNOLOGY – II

Course Code	**18TX44**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:

- Define, Recognize & analyze The principles of weaving motions are the basics for the production of fabrics of all types
- Recognize, Demonstrate &analyze basic of weaving mechanisms. the basic concepts of looms, nomenclature of weaving terms, constructions & working of various motions settings & timings etc.

Module-1

Introduction to Hand looms, power looms, automatic looms and shuttle less looms. Nomenclature of weaving terms. Basic motions in weaving. Shedding - Different types of shed. Positive and negative tappet shedding. Heald reversing mechanism. Staggering of heald, tappet shedding and their characteristics. Different types of tappets. Merits and demerits of tappet shedding, timing, setting, early and late shedding. Study of different types of reed, reed count, heald, heald count.

Module-2

Picking - Objectives of picking. Methods of picking, essentials of good picking, picking accessories cone over picking mechanisms setting & timings. Early and late picking in negative picking. Timing, setting of picking mechanism. Under picking mechanisms. Bowl and shoe under picking mechanism, side lever under picking mechanisms, side shaft under picking mechanisms, Timings & setting methods to alter the timing & strength of picking mechanism Shuttle checking devices for over & under picking mechanism. Swell mechanism reasons for shuttle trap. Beat-Up- Objects: Crank Beat up. Eccentricity of sley. Factors affecting the sley eccentricity. Cam beat-upmechanism.

Module-3

Take up motion - Objects - types of Take up motions Intermittent, continuous Take up motion, 5 wheel take up and 7 wheel take up motions, comparisons and dividend calculations. Continuous worm & warm wheel take up motion, anti-crack motion. Let-off motions – Types of let- off motions and negative let off : Break let off frictional rope or chain lever &wt let off motion construction & working, Positive let off : Basic requirements, advantages, Rapier, Toyoda, Ruti let Off mechanisms. Construction & working of electronic let off Motion. Different types of back rests.

Module-4

Auxiliary Motions- Objects, Necessity & different types. Warp protector motions objects types - loose reed and fast reed.
Electromagnetic warp protector - construction & working. Warp stop motions, drop wires – mechanical & electrical type. Weft stop motions - side weft fork and center weft fork motions.
Construction & working comparisons. Warp easing motions loom banging off.

Module-5

Study of temples choice & suitability: Functions different types of temples. Defects caused by temples. Multiple box motions: weft patterning, 2x1, 4x1, 4x4 motions - construction & working. Automatic Looms - Different types - Cop changing, shuttle changing looms, feelers, types of feelers, shuttle eye cutters, temple eye cutters, construction & working. Fabric defects causes & remedies. Filament weaving: Loom modification & requirements. Speed and production calculations of plain looms.
Management of loom shed; Organization, Weaving plant layout, Ventilation and Humidification, Lighting. Material handling equipment. General information about maintenance. Productivity ;Measurement and control

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

- Recall & Recognize the fundamentals of weaving different motions.
- Recognize Demonstrate &Analyze speed & working of different mechanism production calculation of looms.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**Principles of Weaving**	A.T.C Robinson & R. Marks	Textile Institute	1976
2	**Weaving Machines, Mechanisms Management**	Mk Talukdar, Pk Sriramulu, DB Ajgaonkar	Mahajan Publishers Pvt Ltd	2004
3	**Shuttleless weaving machines**	Oldrich Talavasek	Elsevier Scientific publishing company	1981
4	**Weaving Mechanism**	Bannerjee N.N	Textile Book House	1986
Reference Books				
5	**Woven Fabric production-1**	NCUTE Publication	NCUTE Publication	2002
6	**Cotton weaving**	Gordev. V and Volkov. P	Mir Pub., Moscow	1987
7	**An Introduction to Automatic weaving**	Bennet G.A.	Bennet G.A.	1958

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - IV

CHEMICAL PROCESSING OF TEXTILES – II

Course Code	**18TX45**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:

- To make students learn and understand the basics and advancements in dyeing processes in textile industry.
- To make the students exposed to various machinery employed for the above processes.
- To understand the chemistry of dyes and dyeing auxiliaries and their potential application for various textile fibre fabrics.
- To enhance the knowledge of students towards computer colour matching concepts, eco-friendly dyeing processes and natural dyes.

Module-1

Classification of dyes and principles of dyeing. Chemicals and auxiliaries used for textile dyeing and their functions. Chemical constitution of dyes. Effect of fibre structure on dyeing behavior. Theories of dyeing. Action of electrolytes, effect of dye bath temperature, effect of material to liquor ratio, effect of dye bath pH, Modern concepts of dyeing and selection of dyes for specific end uses. Evaluation of fastness properties of dyed materials

Module-2

Chemistry, properties and application of dyes for Cellulosic fibres:
Direct dyes – Classification, properties, application procedures, after treatments to direct dyed goods.
Reactive dyes – Classification, properties, dyeing conditions, application procedures.
Vat dyes - Classification, properties, dyeing conditions, application procedures.
Sol-vat dyes - Classification, properties, dyeing conditions, application procedures.
Sulphur dyes - Classification, properties, dyeing conditions, application procedures.
Azoic dyes - Classification, properties, dyeing conditions, application procedures.

Module-3

Chemistry, properties and application of dyes for Protein fibres:
Acid dyes - Classification, properties, dyeing conditions and application procedures.
Basic dyes - Classification, properties, dyeing conditions and application procedures.
Mordant dyes - Classification, properties, dyeing conditions and application procedures.
Metal Complex Dyes - Classification, properties, dyeing conditions and application procedures.
Introduction to natural dyes and their methods of application.

Module-4

Chemistry, properties and application of dyes for Synthetic fibres and their blends:
Disperse dyes - Classification, properties, dyeing conditions and application procedures.
Modified basic dyes - Classification, properties, dyeing conditions and application procedures.
Various after treatments given to synthetic dyed goods.
Concepts in dyeing of P/C, P/V and P/W blends

Module-5

MODULE – 5
Garment Dyeing, Dyeing machinery and Concepts of Colour Matching:
Preparatory process for garment dyeing, specialty chemicals and dyes used for garment dyeing. Different types of dyeing practices for various types of garments, precautions to be taken for effective dyeing of garments. Quality control in garment dyeing and garment dyeing machines.
Working principles of dyeing machines for yarns and fabrics such as Winch, Jigger, Jet dyeing machines, HTHP dyeing machines etc. Latest developments in dyeing machinery.
Introduction to colour measurement and computer colour matching concepts. Spectrophotometers and determination of K/S value, Yellowness, Whiteness and Brightness indices.

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

- Learn the chemistry of the various dyes and dyeing processes carried out in chemical processing department.
- Gain knowledge about the dyeing machinery involved.
- Understand the recipes used in dyeing of cellulosic, protein, synthetic fibres and blends.
- Exposed to actual mechanisms involved in various dyeing operations and processes carried out in the industry.
- Gain knowledge about latest developments in dyeing, dyes and auxiliaries, natural dyes etc.
- Gain confidence to work in a dye house

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**Textile Preparation and Dyeing**	Asim Kumar Roy Choudhury	SDC, India	2006
2	**Dyeing and Chemical Technology of Textile Fibres**	E.R. Trotman	John Wiley & Sons Inc	1985
3	**Fundamentals and Practices in Colouration of Textiles**	J.N. Chakraborty,	Woodhead Publishing India Pvt Ltd	2009
4	**Handbook of Textile and Industrial Dyeing – Volume -1, Principles, Processes and types of Dyes**	M Clark	Woodhead Publishing Ltd	2011
5	**Technology of Dyeing**	V AShenai	Sevak Publications, Mumbai	1984
6	**Textile dyeing operations: chemistry, equipment, procedures, and environmental aspects**	Shrikant V. Kulkarni	Noyes Publications	1986
7	**Textile Chemistry, Vol. III- The physical chemistry of dyeing**	R. H. Peters	Elsevier, Amsterdam, The Netherlands	1975
Reference Books				
3	**Textile Auxiliaries and Finishing Chemicals**	R.C.Vora	ATIRA Publications	1975
4	**Modern Techniques of Textile Dyeing, Bleaching and Finishing**	S.M.Arora	Small Industry Research Institute	1993
5	**Chemical Processing of Cotton, Polyester Cotton Blends**	J.R.Modi and A.R. **Garde**	TAI Publications	1960

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - IV

SPINNING TECHNOLOGY LAB-II

Course Code	**18TXL46**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(0:2:2)	SEE Marks	60
Credits	02	Exam Hours	03

Course Learning Objectives:

- The objective of this Course is to describe the basic Practical spinning process of Textile Machineries such as Draw Frame, Comber and Speed Frame. Students acquire the Practical knowledge about the machineries used.

Sl. No	Experiments
	SPEED FRAME:
1	Passage of material through speed frame. Explain different types of drafting system on speed frame.
2	Break draft, main draft, total draft and draft constant calculations. Identification DCP to produce calculation to get different hank of roving on speed frame.
3	Spindle speed drafting rollers speed calculations. TPI and twist constant calculations.
4	Bobbin speed calculation with the help of differential gear mechanism. Building mechanism
5	Production, delivery speed, hank of roving and efficiency calculations of speed frame and their demonstration.
6	Explanation of working of speed frame and setting of drafting roller.
7	Study of passage of material through Ring Frame and demonstration of its working and functions of each parts.
8	Calculation of spindle speed, front roller speed TPI through gearing diagram and also by changing the pulleys and concerned change wheels
9	Calculation of Twist constant through gearing and also TPI calculation for different TCP
10	Break Draft, Main Draft and Total draft calculation through gearing diagram.
11	Study of building mechanism and different types of builds.
12	Working of Ring Frame and calculation of count of yarns for the roving fed by changing the wheels.
13	Working of Ring Frame with different Twist Change wheels.
14	Maintenance schedule of Ring Frame
15	Calculation of Spindle Speed, TPI through gearing on doubling frame
16	Calculation of twist constant, TPI & TPM for different TCP.
17	Demonstration and calculation on O.E. Spinning machine.
18	Practicing and piecing on Ring Frame and study of end breaks

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

- Learn the practical aspects of the machineries used
- Gain knowledge about the process parameters such as Settings, Speeds of Draw Frame, Comber and Speed Frame
- Will be able to define the actual running of the machineries

Conduct of Practical Examination:

1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.■

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - IV

WEAVING TECHNOLOGY LAB- II

Course Code	**18TXL47**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(0:2:2)	SEE Marks	60
Credits	02	Exam Hours	03

Course Learning Objectives:

- The objective of this Course is to describe the basic Practical spinning process of Textile Machineries such as Draw Frame, Comber and Speed Frame. Students acquire the Practical knowledge about the machineries used.

Sl. No.	**Experiments**
1	Study of passage of material through loom, Calculation of loom speed
2	Dismantling, assembling, setting and timing of tappet shedding mechanism.
3	Dismantling, assembling, setting and timing of cone over pick.
4	Dismantling, assembling, setting and timing of cone under pick.
5	Dismantling, assembling, setting and timing of Beat-up mechanism
6	Dismantling, assembling, setting and timing of Take-up mechanism, calculation of dividend, PPI and pick spacing, anti-crack motion.
7	Dismantling, assembling, setting and timing of Let-off mechanism.
8	Dismantling, assembling, setting and timing of Loose-reed mechanism and Fast- reed mechanisms.
9	Dismantling, assembling, setting and timing of side weft fork, and center weft form motion.
10	Drive for pick counter problems on pick counter reading and production, efficiency of loom.
11	Study of different types of box motions. Preparation of weft patterns and drop box chains to control box motions.
12	Weaving practice on Non-auto and box looms. Speed calculation and production calculation of automatic loom and plain looms.
13	Demonstration, dismantling, assembling, setting, timing of cop changing and weft feeler mechanism in an automatic looms. Setting of feeler mechanism, shuttle protector motion, transfer hammer, shuttle eye cutter, temple eye cutter on automatic loom.
14	Demonstration, dismantling, assembling, setting, timing of warp stop motion and positive let-off motion in an automatic looms.

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

- Students acquire knowledge on various weaving motions, settings timings, production calculations and rapiers.
- After acquiring knowledge in this subject, students will be able to work in various industry

Conduct of Practical Examination:

1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - IV

CHEMICAL PROCESSING OF TEXTILES LAB-II

Course Code	**18TXL48**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(0:2:2)	SEE Marks	60
Credits	02	Exam Hours	03

Course Learning Objectives:

- To make the students gain practical knowledge about chemical processing operations especially the preparatory processes.
- To achieve perfectness in experimental skills and the study of practical applications will bring more confidence and ability to understand the recipes used in the operations such as desizing, scouring, bleaching and mercerizing.
- To develop practical exposure to machines used and the process conditions in achieving expected results in various chemical processing preparatory experiments.

Sl. No	Experiments
1	Dyeing of Cotton yarn / fabric using direct dyes
2	Dyeing of Cotton yarn / fabric using reactive dyes (Procion M, H, HE Dyes, Ramazol dyes)
3	Dyeing of Cotton yarn / fabric using Vat/ soluble vat dyes (IN, IK, IW Methods)
4	Dyeing of Cotton yarn / fabric using Azoic colours
5	Dyeing of Cotton yarn / fabric using Sulphur dyes
6	Dyeing of silk with acid and basic dyes
7	Dyeing of silk with metal complex dyes
8	Dyeing of acrylic using basic dyes
9	Dyeing of polyester using disperse dyes with carrier, HTHP and Thermosol dyeing technique
10	Dyeing of garments with various classes of dyes
11	Dyeing of cotton, silk and wool using important natural dyes
12	Determination of K/S and matching of shades using spectrophotometer
13	Analysis of dyes, chemicals and auxiliaries
14	Measurement of washing / rubbing fastness of dyed goods

Course outcomes:

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

- The students will be able to get hands on experience of dyeing of different classes of fibres, fabrics and garments
- They will get experience on various dyeing equipment, settings and handling.
- The students will be exposed to work on computer colour matching instruments and related software

Conduct of Practical Examination:

1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

B.E.(Common to all Programmes)
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - IV

ADDITIONAL MATHEMATICS – II
(Mandatory Learning Course: Common to All Programmes)
(A Bridge course for Lateral Entry students under Diploma quota to BE/B. Tech. programmes)

Course Code	**18MATDIP41**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(2:1:0)	SEE Marks	60
Credits	**0**	Exam Hours	03

Course Learning Objectives:

- To provide essential concepts of linear algebra, second & higher order differential equations along with methods to solve them.
- To provide an insight into elementary probability theory and numerical methods.

Module-1

Linear Algebra: Introduction - rank of matrix by elementary row operations - Echelon form. Consistency of system of linear equations - Gauss elimination method. Eigen values and Eigen vectors of a square matrix. Problems.

Module-2

Numerical Methods: Finite differences. Interpolation/extrapolation using Newton's forward and backward difference formulae (Statements only)-problems. Solution of polynomial and transcendental equations – Newton-Raphson and Regula-Falsi methods (only formulae)- Illustrative examples. Numerical integration: Simpson's one third rule and Weddle's rule (without proof) Problems.

Module-3

Higher order ODE's: Linear differential equations of second and higher order equations with constant coefficients. Homogeneous /non-homogeneous equations. Inverse differential operators.*[Particular Integral restricted to R(x)=* e^{ax}, $\sin ax$ /$\cos ax$ *for* $f(D)y = R(x)$.]

Module-4

Partial Differential Equations(PDE's):- Formation of PDE's by elimination of arbitrary constants and functions. Solution of non-homogeneous PDE by direct integration. Homogeneous PDEs involving derivative with respect to one independent variable only.

Module-5

Probability: Introduction. Sample space and events. Axioms of probability. Addition & multiplication theorems. Conditional probability, Bayes's theorem, problems.

Course Outcomes: At the end of the course the student will be able to:
CO1:Solve systems of linear equations using matrix algebra.
CO2: Apply the knowledge of numerical methods in modelling and solving engineering problems.
CO3: Make use of analytical methods to solve higher order differential equations.
CO4: Classify partial differential equations and solve them by exact methods.
CO5: Apply elementary probability theory and solve related problems.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks.
- Each full question will be for 20 marks.
- There will be two full questions (with a maximum of four sub- questions) from each module.
- Each full question will have sub- question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook				
1	Higher Engineering Mathematics	B.S. Grewal	Khanna Publishers	43rd Edition, 2015
Reference Books				

1	Advanced Engineering Mathematics	E. Kreyszig	John Wiley & Sons	10th Edition, 2015
2	Engineering Mathematics	N. P. Bali and Manish Goyal	Laxmi Publishers	7th Edition, 2007
3	Engineering Mathematics Vol. I	Rohit Khurana	Cengage Learning	1st Edition, 2015

V SEMESTER

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - V

MANAGEMENT AND ENTREPRENEURSHIP IN TEXTILE INDUSTRY

Course Code	**18TX51**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(2:2:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:

The Course aims at updating the knowledge of students in the following fields of management and entrepreneurship.

Basic concepts of management, organisation in Textile and garment Industry.

Basic concepts to become entrepreneurs

Module-1

Management: Introduction Meaning - nature and characteristics of management, Management and Administration roles of management, levels of management, Functions of management, Role of management in improving work quality

Planning: Nature importance and purpose of planning, process types of plans, steps in planning, decision making. Steps in decision making. Planning in Textile and Garment industry

Module-2

Organising and staffing: Nature and purpose of organization principles of organization - Types of organisation, Departmentation, span of control - MBO and MBE, Nature and importance of staffing. Process of selection and recruitment procedure, Concept of team work, smart work and SWOC analysis in Textile industry.

Directing and controlling: Meaning and nature of directing. Leadership types, Motivation theories, Communication and its importance, Coordination, Meaning and importance and Techniques of coordination. Steps in controlling

Module-3

Entrepreneurship: In Textile and Garment industry: Meaning of entrepreneur, Evolution of the concept, Functions of an entrepreneur, Types of Entrepreneur, In entrepreneur- an emerging class, Concepts of Entrepreneurship, Evolution of Entrepreneurship, stages in entrepreneurial process, different source of finance for an entrepreneur- Central and state level financial Institutions.

Micro, Small & medium Enterprises (MSME): Definition Characteristics, Objectives, Scope, role of MSME in Economic Development, Advantages of MSME steps to start an MSME, **Different schemes** : TECKSOK, KIADB, KSSIDC, DIC Single window agency: SISI, NSIC, SIDBI, KSFC. Concept of GST and its importance.

Module-4

Business planning process: Meaning of business plan, Business plan process, advantages of business planning, Marketing plan, production / operations plan, Organization plan, Financial plan and final project report with feasibility study, preparing a model project report for starting a new venture. Business planning in Textile & Garment Industry. Study of MBO, MBE, Importance of decentralisation.

Lean Manufacturing: History and definition. Objectives, Principles and benefits. Tools, Base for apparel industry 5M, 7waste, Concepts, Kaizan, Kamban, 5S, JIT just in time, PDCA, SQCD. Comparison of lean and 6-sigma.

Module-5

International Entrepreneurships Opportunities: The nature of international entrepreneurship, importance of international business to the firm, International versus domestic entrepreneurship, Stages of economic development, entrepreneurship entry in to international business, exporting, direct foreign investment, Barriers to international trade.

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

- The course will prepare students to face problems of industry and to work effectively in various textile and Garment industry
- The course will motivate the students to become team leaders, entrepreneurs in industries.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	Principles of Management	Tirupathi P.C and P.N.Reddy	MCgraw Hill education	2012
2	Entrepreneurship	Poornima Charinthimath	Pearson India Ltd.	2005
3	Management	P.N.Reddy		
4	Management & Entrepreneurship	Prof. Ramesh Burbure	Rohan publishers	2008
Reference Books				
5	Project management and control	Narendra Singh	Himalaya publishing house	2005
6	Work Quality management in textile industry	B. Purushottam	Woodhead publishing Ltd.	2013

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - V

MANUFACTURED FIBRE TECHNOLOGY

Course Code	**18TX52**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:2:0)	SEE Marks	60
Credits	04	Exam Hours	03

Course Learning Objectives:

This course aims at updating the knowledge of students in the following fields of manufactured fibre Technology:

1. Fundamental aspects of synthetic fiber and production of commodity fibres like PET, Nylon, PP and PAN.
2. Studies on various high performance fibres
3. Post spinning operations in manufactured fibres and recent advances in manufactured fibres.

Module-1

Introduction to synthetic fibres. List of synthetic fibres. Raw materials for production of PET. Study of production of PET by DMT & TPA routes - study of side reactions, degradation reactions during PET production. Description of Modification of PET fibres. Polypropylene fibres- production, use of various types of catalysts for Production of PP. Summary of properties of PET and PP fibres.

Module-2

List of **Polyamide fibres**, Discussion on Production of polyamides, nylon-6 study of semi-continuous & integrated continuous process for Production of nylon-6, Production of nylon-66. Composition of N6-N66 production. Modification of nylon fibres. PAN fibres – introduction, Types, Different methods of Production of PAN polymer & Spinning of PAN fibres. **Elastomeric fibres-** origin, definition and production details.

Module-3

Introduction to high performance fibres. Classification of high performance fibres. Study of production and properties of carbon, boron, silicon carbide, alumina & glass fibres. Study of Production of UHMWHDPE by GEL Spinning

Module-4

Define LCPS, Types of LCPS. Study of Production of aromatic polyamides viz. Nomex, Kevlar. Concept of liquid crystal, thermotropic & leotropic polymers fibres. Production and properties of PBZT and PBZO and aromatic polyester fibres.

Study of drawing & heat setting of fibres. Study of tow to top conversion. Cut method, stretch – breaking method.

Module-5

Need for texturing, Define texturing. Introduction to texturing. Study of different methods of texturing. False twist, draw texturing, Study of various parameters affecting false twist texturing. Airjet texturing, stuffer box crimping.

Knife edge crimping, knit-de-knit crimping. Solvent texturing. Analysis of crimp rigidity. Physical bulk & instability of textured yarns.

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

- This subject helps the students to acquire knowledge of synthetic fibres.
- This subject prepares the students work in manufactured fiber plants in India and Abroad.
- Subject also prepares and motivates the students to take up research work in field of manufactured fiber Technology and technical textiles.
- Students will be able to analyze characteristics of textured yarns

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year

Textbook/s				
1	**High Performance fibres**	J.W.S.Hearle	Wood Head,UK	1995
2	**Synthetic fibres**	J.E.McIntyre, J.W.S.Hearle	Wood Head,UK	1999
3	**Manufactured fibre Technology**	V.B.Gupta, Kotari V.K	Chapman & Hall, London	1997
4	**Production of synthetic fibres**	Vaidya A	Prantice Hall, New Delhi	1985
5	**Textile yarns**	Goswamy B.C	Wiley and Sons	1975
Reference Books				
6	**Manmade fibres**	Moncrief R.W	Wiley, NY	1975
7	**Manmade fibre science and Technology**	Mark Atlas, Vol.II and III	Wiley Intr.Sc. NT	1967
8	**New fibres**	T.Hongu	Ellis Horwood, Newyork	1990
9	**Hand book of fibre Science and Technology**	Levin, E.M.Pearce, J.Preston	Marcel Dekkar, New York	1989

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - V

WEAVING TECHNOLOGY – III

Course Code	**18TX53**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:2:0)	SEE Marks	60
Credits	04	Exam Hours	03

Course Learning Objectives:

This course aims at updating the knowledge of students in the following field of Fabric Manufacturing Technology.

1. Dobby Mechanisms, designs, constructions, settings, recent advance in dobby, lattice preparations.
2. Jacquard Shedding various types, open shed, jacquard special jacquard M/c, Harness systems Tie- ups card cutting and casting out.
3. Unconventional looms: Prerequisites, selection, Requirements, weft insertion stages advantages Techno economic feasibilities

Module-1

Introduction to dobby, Classification, comparisons of tappet, dobby, jacquard, Characteristics of different dobby, Keighly dobby, cam dobby, paper controlled dobby, cross border dobby, pick finding devices for dobby, timings & settings, positive dobby's, different types of positive dobbys, Characteristics & working C/B dobby method of pegging lattice for left hand & right hand dobby.

Module-2

Jacquard functions, Types of Jacquard, principle parts of jacquard. Working principle of single lift single cylinder, double lift single cylinder Double lift double cylinder and cross border jacquard, Special jacquard m/c.

Module-3

Developments in mechanical Jacquard, open shed Jacquards, Jacquard harness tie-ups card cutting m/c and producers, casting out, increasing figuring capacity of Jacquard, Electronic Jacquard, programming possibilities in jacquard.

Module-4

Introduction to unconventional looms, disadvantages of conventional looms. Unconventional selvedges, classification of shuttle less looms, weft accumulators, prerequisites for installation of shuttle less weaving m/c. yarn quality requirements, Weft insertion by Projectile, Weft insertion stages. Torsion bar picking, salient features of projectile looms.

Module-5

Classification of Rapier looms. Weft insertion stages in Dewas & Gabler system, salient features. Air quality requirements for Air Jet looms, method of weft insertion on Air jet, water Jet looms, water quality requirements, multiphase weaving; flat multiphase, circulars looms. Narrow looms, Triaxial looms. Management of loom shed, plant layout, ventilation & humidification, lighting & material handling.

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

1. This course prepares the students to know the dobby, jacquard application and new concepts.
2. Students are exposed to the unconventional methods of weaving, techno economic studies, productivity & material handling.
3. Students are able to understand the preparatory process & yarn quality requirements. Loom maintenance and management of loom shed.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				

1	**Principles of Weaving**	ATC Robinson	Textile Institute, Manchester, London	1976
2	**Shuttle less Weaving Machine**	Oldrich Talavasek and Uladimin, Svaty, Elsevlin	Scientific Pub. Co., New YORK	1981
3	**Weaving, Machines, Mechanisms & Management**	D.B.Ajgaonkar, Talukdar	Mahajan publishers pvt. Ltd. Mumbai	1998
4	**Modern Weaving Theory and Practice**	ISHIDA		
Reference Books				
5	**Modern Preparation and weaving Machinery**	A Ormerod	Butterworths London.	1983
6	**Cotton Weaving**	V. Gordev, P Volkov,	Mir PUB	1987
7	**Weaving Mechanism**	Prof. N N Banerjee	Textile Book House, WESTBENGAL.	1982

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - V

CHEMICAL PROCESSING OF TEXTILES -III

Course Code	**18TX54**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:2:0)	SEE Marks	60
Credits	04	Exam Hours	03

Course Learning Objectives:

The objective of this Course is to make students understand the advanced concepts of chemical processing sequences such as printing and finishing. To make them analyze the process conditions in various printing processes, recipes etc. Students will be made to understand and analyze the concepts of textile finishing processes, finishing chemicals and advancements in the areas of printing and finishing techniques.

Module-1

INTRODUCTION TO TEXTILE PRINTING - An overview of the printing process. Selection of dyes/pigments/auxiliaries and textile substrate to suit the end use of the printed textile materials.
The constituents and characteristic of printing paste. Brief study of different binders, thickeners, solvents, discharging agents and other ingredients of printing paste

Module-2

STYLES OF PRINTING – Direct, discharge, resist and special styles - chemicals and mechanisms used for the above styles.
METHODS OF PRINTING – Printing by Hand block, Roller, hand screen, semi -automatic screen, flatbed and rotary screen printing methods. Developments in printing machinery

Module-3

TRANSFER PRINTING – Principle, mechanisms and continuous transfer printing – Transfer printing machinery.
METHODS OF PRINT FIXATION – Drying, curing by dry heat, steam fixation etc.

Module-4

FINISHING - objects and methods of finishing. Classification of various finishes – Various finishing chemicals used and their properties.
CALENDERING – Principle, types of calendaring machines used, merits and demerits.
SANFORIZATION **–** principle and the process.
Anti-crease finish on cotton and protein fibre fabrics. Water repellent/proof finishes, fire retardant finishes. Finishing of woollen materials, silk fabrics and blended products.

Module-5

Finishing of synthetic fibre fabrics - heat setting, de-lustering, anti-static, soil release finishes.
Fundamentals of computerized colour matching – K/S evaluation and principle of spectrophotometers.

Course Outcomes: At the end of the course the student will be able to:
Learn the various printing styles and processes carried out.
2. Gain knowledge about the machinery and process parameters of various printing machines used in textile/garment industry
3. Will be able to understand the basics and advances in finishing Technology.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**Textile printing**	V.A.Shenai	Sevak publications	1996

2	**Textile printing**	L.W.C. Miles	Society of Dyers & Colourists	1981
3	**An Introduction to Textile Finishing**	J T Marsh	Butterworths publications	1979
4	**Principles of Textile Finishing**	A K Roy Choudhury	Woodhead Publishing	2017
Reference Books				
4	**Rendering with Pen and Ink**	Robert W Gill	Thames and Hudson Publication	1984
5	**Printed Textiles**	Terry A Gentille	Olympic Marketing Corp	1987

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - V

TEXTILE TESTING - I

Course Code	**18TX55**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:

- The objective of this course is to make students understand the importance of textile testing and quality control in textile industry. Students are trained to understand various methods and instruments used for testing of fibres and yarns. Students are trained to test the fibres and yarns for various properties, and, calculate, analyse, compare and draw suitable conclusions

Module-1

Introduction to textile testing & quality control. Sampling methods and techniques for fibres, yarns and fabrics. Atmospheric conditions and its measurement. Moisture relations of textile materials. Conditioning of Testing lab and textile materials. Moisture regain and its measurement by various techniques.

Module-2

Fiber dimensions-Fibre length and fineness, importance of these properties, measurement by various methods, principle and instruments. Maturity of cotton fibres and its determination. Neps- causes & effects of nep generation. Nep counting.

Module-3

Fibre strength - Technological importance & determination fibre strength by various conventional methods. Fibre Quality Index (FQI), its importance & calculations. Study of High Volume Instrument (HVI), modules and fibre quality testing parameters. Application of HVI results in spinning mills.

Module-4

Advanced Fibre Information System (AFIS) - working principle, features. AFIS test data analysis. Study of various systems of yarn count & its measurements by various methods & instruments.

Module-5

Yarn twist & its effects on yarn & fabric properties. Importance of twist multiplier. Principles & measurements of single yarn and double yarn twist. Yarn strength & its importance. Methods and principles of yarn strength testing. Instruments and measurement of yarn strength. Yarn friction and its measurement.

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

1. Do testing of textile fibres and yarns
2. Learn methods and principle of testing involved
3. Know the instruments used and the principle of working
4. Understand the quality parameters of textile materials
5. Do the tabulation of test results, analysis, and comparison

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**Physical testing of textiles**	B.P. Soville	Wood Head	1999
2	**Principles of Textile Testing**	Booth J. E	Butterworth, Wendon III Edition	1996
3	**Handbook of Textile Testing and Quality Control**	Grover and Hamby	Wiley Eastern Pvt. Ltd., New Delhi	1969
4	**Physical Properties of textile fibres**	Morton and Hearle	The Textile Institute, Manchester.	2008

5	**Textile Testing**	John H Skinkle	Tarapurwala sons and co. Pvt Ltd	1949
6	**Characteristics of raw cotton**	E Lord	Textile Institute.	1961
Reference Books				
7	**B.I.S. Handbook**	BIS	BIS publications	2000
8	**B.S. Handbook**	G. Weston	BS publications	2009
9	**Textile Testing**	James Lomak, Longmans	Green and Co. London	2002
10	**ASTM standard**	ASTM USA	ASTM publication	1985
11	**Cotton assessment and appreciation**	**SITRA** Norms and Procedures	SITRA, Coimbatore	1017

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - V

WEAVING TECHNOLOGY LAB-III

Course Code	**18TXL56**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(0:2:2)	SEE Marks	60
Credits	02	Exam Hours	03

Course Learning Objectives:

1. The students will learn the preparation of pattern for dobbies and study the types of jacquards, harness and its tie-ups and prepare designs by using point paper and card cutting.
2. The students will study about the working of unconventional looms.
3. Students learn the features of unconventional looms.
4. Learn the production of fabric on unconventional looms.

Sl. No.	Experiments
1	Study of working of dobby mechanism
2	Study of timing & settings of dobbies.
3	Pattern preparation for dobby loom by using pegs and lags.
4	Study of different types of jacquards.
5	Study of working of jacquard mechanism
6	Study of harness and harness tie-ups.
7	Preparation of squared paper design for 100 hooks jacquard and card punching.
8	Study of various features of shuttle less loom or unconventional loom
9	Study of shedding mechanism on unconventional loom
10	Study of weft insertion mechanism on unconventional loom
11	Study of beat up mechanism on unconventional loom
12	Working on unconventional loom and calculation of production and efficiency
13	Weaving of fabric on unconventional loom by changing different weaves

Course outcomes: At the end of the course the student will be able to:

- Students will be able to understand to prepare the designs and produce the samples on the loom.
- Students will be able understand the working of unconventional looms.

Conduct of Practical Examination:

1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - V

CHEMICAL PROCESSING OF TEXTILES LAB-III

Course Code	**18TXL57**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(0:2:2)	SEE Marks	60
Credits	02	Exam Hours	03

Course Learning Objectives:

1. This subject aims to acquire knowledge of various colour theory and printing process of textiles.
2. Practical knowledge on different printing process which brings more confidence in students and they are exposed to different equipment, printing recipes.
3. Knowledge on recent developments.

Sl. No.	Experiments
1	Preparation of colour charts by light, pigment, chromatic circle and Brewster's theory
2	Preparation of printing paste using pigment colours
3	Printing practice using Hand blocks and screens with various classes of dyes
4	Preparation of screens for screen-printing.
5	Resist style (batik) of printing on fabrics
6	Discharge style of printing on cotton, PET and silk
7	Tie and dye printing
8	Anti-crease finishing of cotton using formaldehyde and non-formaldehyde based chemicals
9	Softening of cotton and wool
10	Water proof finishing on cotton
11	Experiments on fastness properties of dyed and printed fabrics
12	Evaluation of dye uptake- K/S using spectrophotometer
13	Experiments on Finishing of garments

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

1. This course helps the students to acquire practical knowledge of various color theory and printing process.
2. Students are exposed to process control, chemicals and auxiliaries used, instruments.
3. This subject prepare the students work in various chemical processing industries

Conduct of Practical Examination:

1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - V

TEXTILE TESTING LAB - I

Course Code	**18TXL58**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(0:2:2)	SEE Marks	60
Credits	02	Exam Hours	03

Course Learning Objectives:
The students are to learn the testing of various fibres and yarns for their various quality parameters. To learn operating instruments, settings, calibration, tabulation of test data, calculations, analysis of teat results and

Sl. No	Experiments
1	**Fibre Tests:** Identification of textile fibres by using microscope.
2	Identification of textile fibres by burning and chemical tests
3	Determination of cotton fibre maturity by Causticaire method.
4	Determination of fibre length parameters by Baer sorter
5	Determination of fibre fineness by Air-flow method.
6	Determination of fibre strength using Stelometer.
7	Blend analysis by chemical methods.
8	Determination of moisture content and regain of textile materials.
9	**Yarn Tests:** Determination of yarn count
10	Determination of single and ply yarn twist.
11	Determination of lea strength and CSP.
12	Determination of single yarn strength, elongation and RKM calculations.
13	Determination of tensile strength of sewing threads.
14	Determination of yarn count, no. of twists, yarn ply and sewability of sewing threads.

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

1. Students are able to understand quality of fibres and yarns.
2. Students are able to test the materials using instruments and methods.
3. Students are able to tabulate the test results and learn calculation s involved.
4. Students are able to analyse the test results and draw conclusions

Conduct of Practical Examination:
1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

B.E IN CIVIL ENGINEERING(CV-2018-19)
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER – V

ENVIRONMENTAL STUDIES

Course Code	**18CIV59**	CIE Marks	40
Teaching Hours / Week (L:T:P)	(1:0:0)	SEE Marks	60
Credits	01	Exam Hours	02

Module - 1

Ecosystems (Structure and Function): Forest, Desert, Wetlands, Riverine, Oceanic and Lake. 02 Hrs
Biodiversity: Types, Value; Hot-spots; Threats and Conservation of biodiversity, Forest Wealth, and Deforestation. 02 Hrs

Module - 2

Advances in Energy Systems (Merits, Demerits, Global Status and Applications)**:** Hydrogen, Solar, OTEC, Tidal and Wind. 02 Hrs
Natural Resource Management (Concept and case-studies): Disaster Management, Sustainable Mining, Cloud Seeding, and Carbon Trading.02 Hrs

Module - 3

Environmental Pollution (Sources, Impacts, Corrective and Preventive measures, Relevant Environmental Acts, Case-studies)**:** Surface and Ground Water Pollution; Noise pollution; Soil Pollution and Air Pollution.02 Hrs
Waste Management & Public Health Aspects: Bio-medical Wastes; Solid waste; Hazardous wastes; E-wastes; Industrial and Municipal Sludge. 02 Hrs

Module - 4

Global Environmental Concerns (Concept, policies and case-studies):Ground water depletion/recharging, Climate Change; Acid Rain; Ozone Depletion; Radon and Fluoride problem in drinking water; Resettlement and rehabilitation of people, Environmental Toxicology. 04 Hrs

Module - 5

Latest Developments in Environmental Pollution Mitigation Tools (Concept and Applications): G.I.S. & Remote Sensing, Environment Impact Assessment, Environmental Management Systems, ISO14001; Environmental Stewardship- NGOs. 03 Hrs
Field work: Visit to an Environmental Engineering Laboratory or Green Building or Water Treatment Plant or Waste water treatment Plant; ought to be Followed by understanding of process and its brief documentation. 01 Hrs

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

- CO1: Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,
- CO2: Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
- CO3: Demonstrate ecology knowledge of a complex relationship between biotic and a biotic components.
- CO4: Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.

Question paper pattern:

- The Question paper will have 100 objective questions.
- Each question will be for 01 marks
- Student will have to answer all the questions in an OMR Sheet.

The Duration of Exam will be 2 hours.

Sl. No.	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	Environmental Studies	Benny Joseph	Tata Mc Graw – Hill.	2nd Edition, 2012

2.	Environmental Studies	S M Prakash	Pristine Publishing House, Mangalore	3rd Edition, 2018
3	Environmental Studies – From Crisis to Cure	R Rajagopalan	Oxford Publisher	2005
Reference Books				
1	Principals of Environmental Science and Engineering	Raman Sivakumar	Cengage learning, Singapur.	2nd Edition, 2005
2	Environmental Science – working with the Earth	G.Tyler Miller Jr.	Thomson Brooks /Cole,	11th Edition, 2006
3	Text Book of Environmental and Ecology	Pratiba Sing, AnoopSingh& PiyushMalaviya	Acme Learning Pvt. Ltd. New Delhi.	1st Edition

VI SEMESTER

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VI

TEXTILE FIBRE PHYSICS

Course Code	**18TX61**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:2:0)	SEE Marks	60
Credits	04	Exam Hours	03

Course Learning Objectives:
Basic concepts of fibre structure, properties and investigation of fibre structure
Basic concepts various mechanical, thermal, moisture, optical, electrical and frictional behavior of fibres.

Module-1

Introduction to structure of fibres. Approaches to polymer fibre structure. List of parameters for reasonable specification of fibre structure analysis of solid state structure of textile fibres using DGC, X-rays, IRS, NMR, SEM and TEM. Study of two phase and one phase model of fibre physical structure

Module-2

Descriptive studies on of physical structure of Cotton, Wool, Silk, PET, Nylon and Acrylic fibres.
Moisture relations: Concept of moisture equilibrium, moisture hysteresis, moisture regain, heat of absorption, swelling of textile fibres. Effect of moisture on various properties of fibres.
Calculations of Mr and Mc of fibres

Module-3

Mechanical properties: Analysis of Stress and strain behaviour, Expression of results of tensile properties, factors affecting tensile behaviour, structure and tensile property correlation, Elastic recovery and weak-link effect. Stress relaxation, creep, factors affecting stress relaxation and creep. Dynamic mechanical properties and their applications. Boltzmann super position principal.

Module-4

Directional effects- Bending of fibres, Twisting of fibres, Shear modulus, Shear stresses and compression fibre masses. Frictional properties, Amonton's laws of friction, deviation of these laws in fibre friction. Nature of fibre friction, the friction of wool fibres

Module-5

Introduction of Optical properties, measurement of birefringence, luster. Importance of optical propertie
Electrical properties: Electrical resistance, static electricity, dielectric properties and measurement of thes properties.
Thermal properties: Thermal conductivity, specific heat, thermal expansion and directional dependence of these thermal properties.

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

- This course work prepares students to face problems related to fibre behavior in various fields of textiles viz; Spinning, Weaving, Chemical processing and Garmenting.
- As this subject deals with most fundamental aspects of textiles (fibres), in-depth knowledge in this subject helps in carrying out any kind of research in textile and allied fields.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**Physical properties of Textile fibres**	Morton &Hearle	WP.	2008

2	**Manufactured fibre technology**	V.B.Gupta and Kotari V.K	Chapman & Hall, London	
3	**Mechanical properties of polymers**	Ward I.M	John wiley & sons, NY	1971
Reference Books				
4	**Mechanical properties of polymer**	Neilson L.E., VolI, II, III	Marcel Dekkar, NY,	1974
5	**Polymer Characterization**	Cambel and White	Chapman & Hall, London1989.	1989
6	**Moisture relations in textiles**	Hearle J.W.S	TI, London	1986

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VI

FABRIC STRUCTURE AND DESIGN - I

Course Code	**18TX62**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:2:0)	SEE Marks	60
Credits	04	Exam Hours	03

Course Learning Objectives:

- The objective of this course is to make students to learn analysis of fabrics for their various construction particulars, manufacturing data and basic designs. Students are to understand the characteristic features and aesthetic qualities of different fabrics. Able to understand various basic designs in order to impart aesthetic value to the fabrics. Students are able to understand the raw material requirements, machine and equipment for the production the fabric. Students understand the end uses of different fabrics and their suitability.

Module-1

Classification of plain woven cloths - approximately square, warp faced and weft faced fabrics, examples of cloths with construction particulars and their applications. Elements of woven fabric structure - weaves and weave notations. Yarn crimp, cover factor & fabric weight. Drawing-in (Draft), Lifting, and Denting plans.

Module-2

Ornamentation of plain fabrics. Modification of plain weaves – Rib, Matt etc. Special Rib, hair cord, & mock rib structures. Twill weaves and fabrics, Twist & twist interactions.
Derivatives of twill weave.
Diamond and diaper designs. Satin & Sateen weaves & fabrics.

Module-3

Simple fancy weaves such as honeycomb, brighten honeycomb, Huck a back, sponge-weaves, Mock leno, crepe & corkscrew weaves. Distorted thread effects. Bed ford cord weaves and fabrics

Module-4

Colour & weave effects. Classification of colour and weave effects, examples of simple colour & weave combinations. Colour & weave combinations to construct longitudinal stripes, cross stripes, check effects etc. BIS standards for the important commercial fabrics.

Module-5

Light and pigment colour theory. Classification of colours. Attributes of colours. Modifications of colours. Colour harmony and colour contrast. Mixed coloured effects with the aid of fibre mixture yarns, twist yarn mixtures and combined coloured threads in the fabrics. Various bases of textile design for figured arrangements. Brief study of history of textile design. Brief study of various historical designs with respect to their main features.

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

1. Learn various construction particulars and manufacturing data
2. Learn raw requirements and loom equipment required to produce the fabric.
3. Learn the analysis of simple basic designs and features of various fabrics

Understand the suitability of these fabrics for particular end uses.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year

Textbook/s				
1	**Woven Cloth Construction**	ATC Robinson and Marks	**T**extile Institute Pub, Manchester	1973
2	**Watson Design and Colour**	Z. J. Grosicki	Universal Pub Corp	1988
Reference Books				
3	**Grammar of Textile Design**	H. Nisbet	D. B. Taraporewala and sons	1985
4	**Design of Woven Fabrics**	Blinov, Shibabaw Balay	MIR Pub	1989
5	**Modern Textile Design and Production**	R. H. Wright	National Trade Press	1970

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VI

TEXTILE TESTING - II

Course Code	**18TX63**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:2:0)	SEE Marks	60
Credits	04	Exam Hours	03

Course Learning Objectives:
The objective of this course is to make students understand the importance of textile testing and quality control in textile industry. Students are trained to understand various methods and instruments used for testing of yarns, fabrics, garments and other accessories. Students are trained to test the yarns, fabrics, garments and other accessories for various properties, and calculate, analyse, compare and draw suitable conclusions.

Module-1

Evenness of various textile strands such as sliver, roving & yarns – random variation, periodic variation, Index of irregularity, Variance-length curves and their importance, Methods of measurement of evenness, principles of various evenness testers & measurement of evenness. Mass variation diagram & spectrogram & its importance. Causes & effects of irregularity in textile strands. Yarn hairiness and its measurements.

Module-2

Determination of fabric length, width, thickness, weight, thread density, and crimp. Determination of flammability, air permeability, and Thermal conductivity.

Module-3

Determination of fabric tensile, tearing and bursting strength. Determination of fabric stiffness, crease, drape of fabrics. Fabric hand and its importance, determination and interpretation of fabric hand test results.

Module-4

Water & fabric relationship. Study of water penetration, wetting of apparels, water repellency of industrial fabrics. Penetration of fabrics by water under pressure.

Module-5

Serviceability, wear, abrasion resistance and Pilling resistance. Estimation of colour fastness. Fabric shrinkage-importance and measurement.

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

1. Test yarns, fabrics and other accessories
2. Understand the methods and principals involved in testing
3. Use Instruments and understand their principle of working
4. Understand the quality parameters of textile materials
5. Tabulate test results, analyses and compare

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**Physical testing of textiles**	B.P. Soville	Wood Head	1999
2	**Principles of Textile Testing**	Booth J. E	Butterworth, Wendon III Edition	1996
3	**Handbook of Textile Testing and Quality Control**	Grover and Hamby	Wiley Eastern Pvt. Ltd., New Delhi	1969

4	**Physical Properties of textile fibres**	Morton and Hearle	The Textile Institute, Manchester.	2008
5	**Textile Testing**	John H Skinkle	New York, N.Y., Chemical Pub. Co.	1949
Reference Books				
7	**B.I.S. Handbook**	BIS	BIS publications	2000
8	**B.S. Handbook**	G. Weston	BS publications	2009
9	**Textile Testing**	James Lomak, Longmans	Green and Co. London	2002
10	**ASTM standard**	ASTM USA	ASTM publication	1985
11	**Cotton assessment and appreciation**	**SITRA N**orms and procedures	SITRA, Coimbatore	1017

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VI

SERICULTURE AND SILK TECHNOLOGY

Course Code	**18TX641**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:

Status of sericulture and growth of silk industry in India & abroad
2. Principles of Rearing silk worms, environmental condition of rearing, grainages.
3. Physical and commercial characteristic of cocoon reeling M/c. Technology advancements
4. Silk by products, wet processing, and recent developments in wet processing.

Module-1

Introduction to Sericulture and silk industry, Status of sericulture and silk industry in India and abroad. Mulberry cultivation practices, environmental conditions, types of mulberry, Silk worm rearing, and Environmental conditions for silk worm rearing, various methods.
Chawki rearing, Late age silk worm rearing, recent developments in rearing. Seed production & Grainage activities. Diseases & pests & their control

Module-2

Different types of cocoons, Physical and commercial characteristics, sorting and testing of cocoons. Stifling of cocoons, objects, various methods: open pan, three pan, Conveyor cooking etc.
Merits & Demerits of silk reeling, systems of reeling, charka, Cottage basin, multi end filature automatic reeling machine, Re-reeling, recent developments in silk reeling.

Module-3

Silk throwing, Objects, Winding, doubling, Rewinding and twisting, Manufacture of silk yarns for ordinary, Chiffon, Crape, Georgette fabrics.
Recent developments in silk throwing machines. Silk weaving preparatory for warp & weft yarns, handloom & power looms special features, modifications required to weave silk fabrics.

Module-4

Introduction to spun silk industry, Different source of waste, Sequence of operations in spun silk production, end uses of spun silk yarns. Noil yarns.
Testing & grading of silk yarns. Chemical processing of silk degumming of silk fabrics.

Module-5

Dyeing of silk fabrics. Printing & finishing of silk fabrics. Recent developments in wet processing of silk fabrics, silk by-products, properties and application.

Introduction to non-mulberry silks and their applications.

Course Outcomes: At the end of the course the student will be able to:
1. This course makes the students to understand silk potential in India and abroad.
2. Student can take the projects and research work in Silk Technology field jointly with KSSRDI, central silk board, and State Silk Board.
3. Students to be become entrepreneurs in silk industries like Reeling, Twisting, Silk weaving and by products this course will give valuable outputs.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				

1	**Hand Book of practical sericulture**	S R Ullal and M N Narasimhanna	Central Silk Board, India	1987
2	**Manuals on Sericulture Vol – I, II**	Various Authors	FAO Publication	1976
3	**Hand Book of Silk Technology**	T N Sonwalkar	Taylor and Francis	1993
4	**Mulberry silk Reeling Technology**	D. Mahadevappa, V G Halliyal, D G Shankar, Ravindra Bhandiwad	Oxford and IBH publishing company Pvt. Ltd	2000
Reference Books				
1	Silk Weaving	Compiled by Zhejiang Silk Engineering Institute	Science Pub Inc	2002

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VI

ERECTION AND MAINTENANCE OF TEXTILE MACHINERY

Course Code	**18TX642**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:

The objective of this course is to make students understand the basic spinning processes in Textile Industry and to understand the various spinning operations such as Blow Room, Carding. Students acquire theoretical knowledge about the machineries used. They will be familiarized with erection and maintenance schedules of various machineries used in spinning and weaving.

Module-1

Basic definitions related to mechanical design, vibration resistance, heat resistance, reliability, longevity, maintainability. Brief outline of engineering material.
Different kinds of tools and the devices employed for erection and maintenance. Erection of machines, hoisting - equipment, overhead cranes, machine installation conditions. Functions, prerequisite of maintenance and its classification.

Module-2

Function and classification of power transmission equipment and transmission members. Erection of machines, hoisting - equipment, overhead cranes, machine installation conditions. Functions, prerequisite of maintenance and its classification.

Module-3

Methods and kinds of repairs of textile equipment used in different departments.
Cleaning and washing of parts. Various kinds of wears. Main factors influencing the wear of machine parts and methods increasing their wear resistance. Failure prediction of parts, units and mechanisms

Module-4

Basic concepts of maintenance, Study of different maintenance programmer, routine and preventive, predictive, remedial and restorative maintenance.
Maintenance of spinning, weaving, processing equipment as per the schedule.

Module-5

Function of prerequisite of lubricants, different lubricants used in the textile industry, method of lubrication.
Maintenance of ledgers spare parts etc. machinery maintenance audit and its advantages. Housekeeping, overhauling

Course outcomes:

At the end of the course the student will be able to:
1.Learn the various spinning processes carried
2. Gain knowledge about the maintenance of all the Textile Machineries
3. Learn the types of maintenance

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**Spinning Textile machinery maintenance**		SITRA Coimbatore	1980

2	**Weaving Textile Machinery maintenance**		BITRA, Bombay	1980
3	**Spinning, Weaving- & processing machinery maintenance in textile mills**	B.B. Joshi	Textile & Allied industry research organization, Baroda	1970
Reference Books				
1	**Repairs and maintenance**		Pub, MIR	

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VI

NANO TEXTILES

Course Code	**18TX643**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:

- To teach the concept of Nano technology and its application in textiles.
- To educate the production of nanofibres by different process
- To impart knowledge on Nano composites and their properties.

Module-1

Nano fibres

Process: Electro spinning – properties – improvement – fibre morphology – fibre alignment.
Bi-component cross sectional Nano fibre

Module-2

Nanotubes and Nano Composites

Carbon nano tubes: synthesis – characterization techniques – nano tubes – Polymer fibres – structures – production process – properties – fibre morphology.
Carbon nanotubes applications

Module-3

Nanofiller Polypropylene Fibres

Polymer layered silicate nano composites: structure and properties – Nano composites
Dyeing of Polypropylene – Modified propylene for improved dyeability.
Assessment of dyed polypropylene

Module-4

Nano Coating of Textiles

Surface modification techniques – anti-adhesive nano coating of fibre and textiles – water and oil repellent coating, self-cleaning. Functional textiles: protection – applications.
Applications of nano coated textiles for filtration

Module-5

Hybrid Polymer Nanolayers

Thin hybrid film – smart textiles – polymer to polymer hybrid layers – polymer to particles hybrid layers.
Nanofabrication of thin polymer fibre – "Grafting from" and "Grafting to" techniques for synthesis of polymer films, synthesis of smart switchable coatings.
Synthesis of hdrophobic materials

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

- The graduates will become familiar with fundamentals of various science and technology subjects and thus acquire the capability to applying them.
- The graduates will demonstrate their ability to solve technical problems via technical approaches, self-study, team work and life-long learning approaches.
- The graduates will develop capacity to understand professional and ethical responsibility and will display skills required for continuous and life-long learning and up gradation.
- The graduates will have sound foundation for entering into higher education programmes.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				

1	Nanofibres and Nanotechnology in Textiles	P. J. Brown and K. Stevens	Woodhead Publishing Limited, England	2007
2	Springer Handbook of Nanotechnology	Bharath Bhushan	Springe	2004
Reference Books				
1	Synthesis of various forms of Carbon Nanotubes	H. Zeng, L. Zhu, G. Hao and R. Sheng	AC Arc Discharge	1998
2	Carbon Nanofibres for Composites Applications	E. Hammel, X. Tang, M. Trampert, T. Schmitt, K. Mauthner,	Woodhead Publishing Limited, England	2004

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VI

KINITTING AND NONWOVEN TECHNOLOGY

Course Code	**18TX651**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:
The objective of this course is to make students understand the basic concepts of knitting and nonwoven technology

Module-1

Knitting industries position in India, general terms and principles of knitting technology. Knitting Elements, Elements of knitted loops structures. Comparison of warp and weft knitting.
WEFT KNITTING: The four primary weft knitted structures –Plain, Rib, Interlock and Purl. Production of above structures on knitting machines.

Module-2

Types of weft knitting machines – flat machines and circular machines. Knit, Tuck and Float stitches. The effect of Tuck and float stitches on knitted fabrics.
Ornamentation of weft knit structures: Horizontal striping, intarsia, plaiting.

Module-3

Derivatives of plain and rib structures. Double knits.
Needle selection for weft knit designing: Multi cam track, Pattern wheel, Pattern drum and Electronic selection device. Knitted fabric geometry, tightness factor, robbing back, and needle bounce. Different types of positive feeds and their advantage. Properties of hosiery yarns. Defects in weft knitted fabrics.
Introduction to warp knitting.

Module-4

Introduction to non-woven fabric, comparison with other fabric forming methods, Classification of non-woven (various approaches). Fibres used in non-woven and their Characteristic features and properties of fibres. MANUFACTURE OF NON-WOVEN: Dry methods - various methods of web preparation (opening, blending and cleaning machines used) technology used in production of parallel, cross-laid and random laid webs, web laying, machines.
WET METHODS: principles and raw materials, web laying, concept of drift deposition.

Module-5

Various methods of bonding web: Mechanical bonding - needle punching, Hydroentanglment process and spun lace methods, Methods of thermal bonding - Hot calendaring, belt calendaring, Through air thermal bonding, infrared bonding, Ultrasonic bonding, spun bonding , melt blown processes. Chemical bonding: Saturation bonding, Foam bonding, Spray bonding, print bonding, powder bonding. Applications of non wovens.

Course outcomes: At the end of the course the student will be able to:

1. Students will be able to understand the production of knitted structures.
2. Student's practical knowledge will be updated regarding different types of knitted structures such as single jersey, rib structures.
3. Students will be able to understand the production of nonwoven fabrics.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				

1	**Knitting Technology**	David J Spencer	Pergamon Press	1985
2	**Knitting Technology**	Ajgaonkar	Universal Publishing Company	1998
3	**Circular Knitting**	Mammel Schach	Textile Trade Press, Manchester	1998
4	**Non Woven**	Radkocroma		1971
5	**Non Woven Bonded Fabrics**	J.Lunenscoloss	Ellis Hotwood, London	1985
6	**Needle Punching**	Purdy	The Textile Institute, Manchester	1980
Reference Books				
7	**Knitting Technology**	Dr.Munden		
8	**Knitting Fundamentals, Machines, structures and developments**	N. Anbumani	New Age International Publications	2007

B.TECH. (TEXTILE TECHNOLOGY/SILK TECHNOLOGY)
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VI

ENVIRONMENTAL MANAGEMENT IN TEXTILE INDUSTRY

Course Code	**18TX652**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course objectives:
The objective of this course is to make students understand environmental management aspects in textile industries. This course will enable the students to understand the significance of pollution control measures, quality of water and effluent treatment methods.

Module-1

Introduction to Environment Management. Scope and objectives, Benefits.
Quality of Water. Water quality requirements for textile wet processing.

Module-2

SEWAGE- DEFINITION- characteristics of sewage, general methods of treatment of sewage, disposal of sewage.
INDUSTRIAL EFFLUENTS: The disposal of industrial effluents in to streams. Characteristics of textile mill effluents, disposal and effect on the receiving streams.

Module-3

Noise pollution, causes of noise pollution, effects of noise pollution, remedial measures. Methods of noise control in textile mills.
Brief discussion about different instruments used in analysis of effluents.

Module-4

Brief discussion about different instruments used in analysis of effluents.
Sources of pollution and its control. Various methods of industrial waste water treatment. Treatment of effluents received from textile wet processing industries.

Module-5

Filtration and filtration methods. Role of filter fabrics in pollution control. Indian pollution acts, their role and effectiveness. Recent developments in pollution control in various processes in textile mills and manufacturing plants.

Course outcomes: At the end of the course the student will be able to:

1. This subject helps the student to acquire the concepts of environmental management for textile industries.
2. This subject prepares the student apply environmental concept tools, pollution control norms and effluent control measures in textile/garment manufacturing industries
3. Students are exposed to environmental laws, EA systems, effluent treatment methods and concepts so that they apply these concepts in the actual work environment for maximum benefits.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks.Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl. No.	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	Water Supply and Sewage	Terence Mcghee	McGraw Hill Publication	2013
2	Environmental Pollution and its Control	S.A.Abbasi	Discovery Publishing Pvt.Ltd	2010
3	Waste Water Treatment	M. N. Rao and A. K. Dutta	Oxford & IBH Publishing Co Pvt.Ltd	2015

Reference Books				
3	Efficient use of Fuel	Geoffrey Edwin Foxwell	H. M. S. O. Publication London	1958

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VI

FINANCIAL MANAGEMENT

Course Code	**18TX653**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:

1. To familiarize the students with basic concepts of financial management.
2. To understand time value of money and cost of capital.
3. To analyze capital structure, capital budgeting and dividend decision.
4. To understand the short term and long term financing and working capital management.

Module-1

Finance function, goals of finance management, Financial planning, and Major financial decision areas.
Sources of Financing: Shares, Debentures, Term loans, Lease financing, Hybrid financing,
Venture Capital, Angel investing and private equity, Warrants and convertibles (Theory Only)
Capital structure: measure of leverage, effects of lever - I, traditional approaches, MM theory of financial leverage and value of the forms. Designing of capital structure- EBIT- EPS analysis, risk-return trade-off.

Module-2

Investment decisions– Capital budgeting process, Investment evaluation techniques – Net present value, Internal rate of return, Modified internal rate of return, Profitability index, Payback period, discounted payback period, accounting rate of return.

Module-3

Capital structure: measure of leverage, effects of lever- I, traditional approaches, MM theory of financial leverage and value of the forms. Designing of capital structure- EBIT- EPS analysis, risk-return trade-off.
Dividend policy**:** Factors affecting dividend policy relevance of the dividend policy- Walters model, Gordon's model- M.M. theory, and types of dividend policies- Bonus shares - corporate dividend policy in practice.

Module-4

Market for corporate securities, trading procedures in stock exchange, financial services, leasing, mutual funds, SEBI and market regulation. Working capital management, receivables, inventories and cash management, Merger and take-overs.
Objects of costing**-**elements of costs, types of overheads, Allocation of factory over heads, Methods-determination of selling price. Definition and objects of depreciation-break-even analysis.

Module-5

Definition and Advantages of Cost Accounting. Elements of cost. Introduction, classification, elements and allocation of Material cost. Labour cost and overhead cost.
Process cost calculation**-** introduction, special features of Textile processing and its cost calculation. Introduction to standard costing and Budgetary control. Statutory guidelines on the maintenance of cost records.

Course Outcomes:

1. Understand the basic financial concepts
2. Apply time value of money
3. Evaluate the investment decisions
4. Analyze the capital structure and dividend decisions.
5. Estimate working capital requirements

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				

1	Financial Management	Rajiv Srivastava and Anil Misra,	Oxford University Press	2011
2	Financial Management	Shashi K Gupta and R K Sharma	Kalyani Publishers	2014
3.	Financial Management- Theory and Practice-8th Edition	Prasanna Chandra	McGraw Hill Education	2011
Reference Books				
3	Fundamentals of Financial Management – 12th Edition	Brigham & Houston	Cengage Learning.	2012
4	Financial Management	V K Bhalla	S. Chand Publishing	2014
5	Financial Management: Principles and Applications-10th Edition	Arthur J. Keown, John H. Martin, John W. Petty and David F. Scott	Prentice Hall	2004

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VI

FABRIC STRUCTURE AND DESIGN LAB - I

Course Code	**18TXL66**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(0:2:2)	SEE Marks	60
Credits	02	Exam Hours	03

Course Learning Objectives:

- To learn analysis of fabrics and know their construction and manufacturing details. To know various design features and their aesthetic values. To understand the manufacturing requirements of fabrics with various basic designs. To understand the use of colours and colour combinations in the production of fabric designs.

Sl. No.	Experiments
1	Analysis of Plain wave fabrics
2	Analysis of Twill weave fabrics
3	Analysis of Honey comb weave fabrics
4	Analysis of Huck back weave fabrics
5	Analysis of Mock leno weave and other towelling fabrics
6	Analysis of Satin weave fabrics
7	Analysis of Sateen weave fabrics
8	Creation of stripes and checks effect on paper using suitable colours
9	Creation of floral design on paper by suitable colours
10	Creation of animation patterns and other designs on paper by suitable colours
11	Creation of suitable designs on dobby looms
12	Creation of suitable designs on jacquard

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

- Students learn the analysis of fabrics for construction details
- Students to learn the analysis of manufacturing details
- Students know the design features and production aspects

Conduct of Practical Examination:

1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VI

TEXTILE TESTING LAB - II

Course Code	**18TXL67**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(0:2:2)	SEE Marks	60
Credits	02	Exam Hours	03

Course Learning Objectives:
The students are to learn the testing of various yarns and fabrics for their various quality parameters. To learn operating instruments, settings, calibration, tabulation of test data, calculations, analysis of teat results and draw conclusions.

Sl. No.	Experiments
1	Determination of yarn evenness by visual examination.
2	Determination of evenness of sliver, roving and yarn.
3	Determination of geometrical properties of fabrics.
4	Determination of Air Permeability of fabrics
5	Determination of crease recovery property of fabrics.
6	Determination of drape co-efficient of fabrics.
7	Determination of fabric stiffness and its parameters
8	Determination of fabric strength and elongation.
9	Determination of fabric tearing strength.
10	Determination of fabric bursting strength.
11	Determination of abrasion resistance of fabrics.
12	Determination of pilling tendency of fabrics.
13	Determination of colour fastness of dyed and printed fabrics for washing
14	Determination of colour fastness of dyed and printed fabrics for perspiration.
15	Determination of dimensional stability of fabrics.
16	Determination of fastness properties of dyed fabric for artificial light and sun light.
17	Determination of Fastness Properties of printed and dyed fabric for rubbing.

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

1. Students are able to understand quality of fibres and yarns.
2. Students are able to test the materials using instruments and methods.
3. Students are able to tabulate the test results and learn calculation s involved.
4. Students are able to analyses the test results and draw conclusions.

Conduct of Practical Examination:

1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VI

MINI PROJECT

Course Code	**18TXMP68**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(0:0:2)	SEE Marks	60
Credits	02	Exam Hours/Batch	03

Course Learning Objectives:

- To support independent learning and innovative attitude.
- To guide to select and utilize adequate information from varied resources upholding ethics.
- To guide to organize the work in the appropriate manner and present information (acknowledging the sources) clearly.
- To develop interactive, communication, organisation, time management, and presentation skills.
- To impart flexibility and adaptability.
- To inspire independent and team working.
- To expand intellectual capacity, credibility, judgement, intuition.
- To adhere to punctuality, setting and meeting deadlines.
- To instil responsibilities to oneself and others.
- To train students to present the topic of project work in a seminar without any fear, face audience confidently, enhance communication skill, involve in group discussion to present and exchange ideas.

Mini-Project: Each student of the project batch shall involve in carrying out the project work jointly in constant consultation with internal guide, co-guide, and external guide and prepare the project report as per the norms avoiding plagiarism.

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

- Present the mini-project and be able to defend it.
- Make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task.
- Habituated to critical thinking and use problem solving skills.
- Communicate effectively and to present ideas clearly and coherently in both the written and oral forms.
- Work in a team to achieve common goal.
- Learn on their own, reflect on their learning and take appropriate actions to improve it. ■

CIE procedure for Mini - Project:

The CIE marks awarded for Mini - Project, shall be based on the evaluation of Mini - Project Report, Project Presentation skill and Question and Answer session in the ratio 50:25:25.The marks awarded for Mini - Project report shall be the same for all the batch mates. ■

Semester End Examination

SEE marks for the mini-project shall be awarded based on the evaluation of Mini-Project Report, Presentation skill and Question and Answer session in the ratio 50:25:25 by the examiners appointed by the University.

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VI

INTERNSHIP

All the students admitted to III year of BE/B. Tech. shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and /or VII and VIII semesters. A University examination shall be conducted during VIII semester and the prescribed credit shall be included in VIII semester. Internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not take-up/complete the internship shall be declared as fail and shall have to complete during subsequent University examinations after satisfying the internship requirements.

Course Code	Refer to VIII semester scheme	CIE Marks	40
Duration of internship	04 weeks	SEE Marks	60
Credit	02	Exam Hours/ Batch	03

Course Learning Objectives:

Internship/Professional practice provide students the opportunity of hands-on experience that include personal training, time and stress management, interactive skills, presentations, budgeting, marketing, liability and risk management, paperwork, equipment ordering, maintenance, responding to emergencies etc. The objective are further,

- To put theory into practice.
- To expand thinking and broaden the knowledge and skills acquired through course work in the field.
- To relate to, interact with, and learn from current professionals in the field.
- To gain a greater understanding of the duties and responsibilities of a professional.
- To understand and adhere to professional standards in the field.
- To gain insight to professional communication including meetings, memos, reading, writing, public speaking, research, client interaction, input of ideas, and confidentiality.
- To identify personal strengths and weaknesses.

Internship: Students under the guidance of internal guide/s and external guide shall take part in all the activities regularly to acquire as much knowledge as possible without causing any inconvenience at the place of internship.

Seminar: Each student, is required to

- Present the seminar on the internship orally and/or through power point slides.
- Answer the queries and involve in debate/discussion.
- Submit the report duly certified by the external guide.

The participants shall take part in discussion to foster friendly and stimulating environment in which the students are motivated to reach high standards and become self-confident.

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

- Gain practical experience within industry in which the internship is done.
- Acquire knowledge of the industry in which the internship is done.
- Apply knowledge and skills learnt to classroom work.
- Develop a greater understanding about career options while more clearly defining personal career goals.
- Experience the activities and functions of professionals.
- Develop and refine oral and written communication skills.
- Identify areas for future knowledge and skill development.
- Expand intellectual capacity, credibility, judgment, intuition.
- Acquire the knowledge of administration, marketing, finance and economics. ■

Continuous Internal Evaluation

CIE marks for the Internship shall be awarded by the committee constituted for the purpose by the Head of the Department. The committee shall consist of three faculty from the department with the senior most acting as the Chairman.

The CIE marks awarded shall be based on the evaluation of Internship Report, Presentation skill and Question and Answer session in the ratio 50:25:25.

Semester End Examination

SEE marks for the Internship shall be awarded based on the evaluation of Internship Report, Presentation skill and Question and Answer session in the ratio 50:25:25 by the examiners appointed by the University.

VII SEMESTER

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VII

STRUCTURE AND PROPERTIES OF SILK

Course Code	18ST71	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:
The main objective of this course is to make students understand the basic concepts of structure of silk fibres and properties. The objectives include, understanding of physical and chemical structure of silk fibres and various physical, mechanical and other properties of silk fibres in detail.

Module-1

Introduction to structure of silk. Composition of silk - amino acid composition, microstructure and appearance, Longitudinal and cross-sectional views, density and moisture regain of silk.

Module-2

Microstructure of silk-Crystal Structure, crystallinity, orientation, crystal size, birefringence, sonic modulus. X-ray studies, IR Spectroscopy studies on silk and their importance.

Module-3

Introduction to Properties of silk. Tensile properties – Stress-strain characteristics, visco-elastic behaviour, creep and stress-relaxation, inverse stress-relaxation.

Module-4

Dynamic mechanical behaviour. Thermal properties -DSC, DTA and TGA studies on silk. Optical Properties of silkworm silk.
Introduction to Spider silks and their applications: Types of spider silk, chemical compositions, general properties, tensile properties and application of spider silk.

Module-5

Dyeing and Finishing of silk fibre fabrics: Types of dyes used, factors affecting dyeing behaviour of silk and preparation silk for dyeing. Recent developments in degumming, bleaching and dyeing. Dyeing of silk with reactive, direct and natural dyes.
Finishing of silk fabrics: Types and methods modern technologies involved to impart wrinkle resistant finish, stair repellent, anti – microbial finish and other specialty finishes applicable to silk and its blends.

Course outcomes: At the end of the course the student will be able to:
1. Learn about Organization of the Apparel Industry and Business Concepts of Apparel Industry-
2. Gain knowledge about Marketing and Merchandising Strategies
3. Will be able to understand the basics garment analysis and Standards for Quality, Fit, and Performance
4. Will be able to understand the apparel design.
5. Able to understand about the apparel export marketing

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	Silk-Processing, properties and Applications	K.Murugesh Babu	Woodhead Publishing Limited	2013

2	Hand book of silk Technology	T.N. Sonwalkar	New Age International (P) Limited	2001
3	Silk Wet Processing	Dr. M. L. Gulrajani	IIT Publication	
4	Silk Dyeing	Dr. V. A. Shenai	Sewak Publications	
5	Silk Dyeing, Printing and Finishing	G H Hurst	Summer Press Publications	
Reference Books				
6	Handbook of Sericulture Technologies	S.B. Dandin,	Central Silk Board	2003
7	Silk Reeling and Testing Manual		FAO	

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VII

FABRIC STRUCTURE AND DESIGN - II

Course Code	**18TX72**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:

- The objective of this course is to make students to have a knowledge about special design features of various complicated and intricate design fabrics. Students are to learn analysis of these fabrics for their various construction particulars, manufacturing data and design details. Students are to understand the characteristic features of fabrics, design features and aesthetic qualities of different fabrics. Students will understand the raw material requirements, machine and equipment for the production the fabric. Students understand the end uses of different fabrics and their suitability.

Module-1

Welts & pique fabrics, weft wadded pique, figured pique Fabrics. Extra warp and extra weft fabrics. Backed weaves and fabrics

Module-2

Double cloths- Classification, selection criteria for threads, weaves etc., self-stitched double cloths, interchangeable double cloths. Centre stitched double cloths.

Module-3

Gauze and leno structures, principles of leno structure, basic sheds in leno structure, leno weaving with flat steel dupes with an eye, Russian cords design, simple net leno, Easing action shaker device. Principle of designing simple damask and brocades.

Module-4

Weft pile fabrics - all over or plain velveteen, corded velveteen, Warp pile fabrics produced with the aid of wires and by face to face principle.

Module-5

Terry pile structures - formation of pile, terry weaves, figured terry pile fabrics. Narrow fabrics. Uncommon woven structures- Lappet & Swivel fabrics.

Course Outcomes: On completion of this course, Students will be able to

1. Learn various construction particulars and manufacturing data
2. Learn raw requirements and loom equipment required to produce the fabric.
3. Learn the analysis of complicated and intricate design features of various fabrics
4. Understand the suitability of these fabrics for particular end uses.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**Watsons Advanced Textile Design**	Z.J Grosicki	Universal Publishing Corporation, Bombay	1988
Reference Books				
2	**Grammar of Textile Design**	H. Nisbet	Taraporewala and Sons	1985

B. E. SILK TECHNOLOGY
Outcome Based Education (OBE) and Choice Based Credit System (CBCS)
SEMESTER - VII

FASHION DESIGN AND GARMENT MANUFACTURE

Course Code	**18TX73**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:

This course aims at updating the knowledge of students in the following field of Fashion designing & Garment Technology.

1. Fashion Concepts consumer expectation about textiles. Fashion theories design elements psychological influence of clothing. Techniques of body measurement standard sizes selection of fashion for different end uses.
2. Garment flow process, sourcing, sourcing issues global sourcing fabric inspection procedures, spreading various cutting methods garment making process.
3. Technology advancement process sewing m/c production techniques, Garment inspection, Shipping, SMV

Module-1

Consumer expectation of textiles. Consumer knowledge about textiles. Fashion Terminologies, elements of design, fashion theories, Factors influence fashion, Fashion cycle, Principles of design. Selection of fabrics for different end uses. Measurement Techniques

Module-2

Sourcing, Global sourcing, Role of sourcing discussion in Apparel firms. Material sourcing process. Fabric inspection methods. Principle & practices of pattern making. Grading, Computer aided pattern making spreading, cutting, Numbering & bundling.

Module-3

Study of different types of stitches & seams. Seams appearance & performance, study of sewing threads. Thread consumption calculation, sewing needles, Fundamentals of swing M/c, different types of sewing M/c. Work aids, puckering, reasons and remedies for different types of puckering

Module-4

Pressing: Types, Elements of pressing. Types of pressing equipment's. Technological advancement fusing Advantages, requirements, Fusing processes. Equipment's, methods, support materials purpose. Lining, Inter linings, Closures, Zippers, Buttons, snaps, Hooks, loop tape, Elastics, trims, Types &source of trims.

Module-5

Apparel production systems garment Quality control Inspection of garments. Under different AQL standards like 2.5, 3.0 & 4.0 concept of production planning productivity, resource management Ergonomics apparel Engineering basic concepts work flow on work study techniques, SMV Calculation.
Costing - Procedures, systems of costing, stages of costing, pricing strategies.

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

1. Fashion & garment industries, fashion trends, fashion forecasting, consumer expectations of textiles.
2. Students are able to understand the production process, quality control, quality control studies, merchandising process, export & import policies.
3. Students who want to become entrepreneurs this course gives the detailed input to start up new garment industries

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**The Technology Of Clothing Manufacture**	Carr H. & Latham B	Blackwell Scientific Publication, Oxford England	1988
2	**Metric Pattern Cutting**	Aldrich W	Blackwell Scientific Publication, Oxford England	1992
3	**Apparel Manufacturing**	Ruth E. Glock, Grace I	Kunz PE Publication, UK	2005
4	**Apparel manufacturing handbook**	Jacob Solinger	Van Nostrand Reinhold company.	2012
Reference Books				
1	**Pattern Cutting for Women's Outwear**	Gerry Cooklin	Blackwell Scientific Publication, OxfordEngland	1996
2	**The NIFT Book of Grading and sizing**	NIFT Faculty	NIFT, New Delhi	1992
3	**Fashion Source Book**	Kathryn Mikelvey	Blackwell Scientific Publication, Oxford England	1994

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SEMESTER - VII

INDUSTRIAL ENGINEERING

Course Code	**18TX741**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:
The objective of this course is to understand the importance of Industrial engineers and industrial engineering department in Textile and Garment Industry. This course will enable the students to get familiarized with plant location, layout, work study and time study concepts.

Module-1

Importance of Industrial Engineering department in Textile and Garment Industry. Position of Industrial Engineering department in industry. Management, Administration and organization. Professional and scientific management. Difference between management and administration. Study of different types of organization.

Module-2

Plant location and Plant layout. Definition of plant location. Factors influencing the plant location. Types of plant location and their advantages and limitations.
Plant layout. Definition of Plant layout. Objects of Scientific layout. Principles of Layout. Types of layout and their detailed study.

Module-3

Work study and its importance definition of work-study. Success of organization through work-study technique. Objects of work study. Problems of work study.
Method study and its objects. Steps of method study and detailed study of each step. Determination of new method to complete each activity in industry.

Module-4

Time study. Definition of Time study and its objects. Detailed study of each steps of Time study. Determination of Normal time, Observed time and Standard time.
Study of different types of allowances. Study of Decimal minute stop watch for recording all the activities.

Module-5

PLANNING AND FORECASTING: Planning and its concept in industry. Detailed study of TEAM work, SMART and POSDCORB and SWOT analysis.
Production planning and Control (PPC). Importance of PPC and its detailed study in Industry.
Study of Value of money, Inflation and Deflation currency, Supply and Demand factor and its impact on society

Course Outcomes: On completion of this course, Students will be able to:
1. Learn the importance of Industrial engineering department
2. Gain knowledge about the position of industrial engineering department
3. Will be able to understand the concept of this scientific tool

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				

1	Production and Operations Management	R.Paneerselvam	Prentice Hall of India	2002
2	Strategic operations Management	Robert H. Lowson	Vikas Publishing House	2003
Reference Books				
3	Production and operations management	Thomas E Morton	Vikas Publishing House, First Indian reprint	2003
4	Computer Aided Production Management	Mahapatra P B	Prentice Hall of India	2001
5	Production Management	Martand T Telsang	S Chand and Company	2003

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SEMESTER - VII

FIBRE REINFORCED COMPOSITES

Course Code	**18TX742**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives :

This Course aims at updating knowledge of students in following fields of FRCS.

1. Basic concepts of FRCS, comparison metals and FRCS, various term used in FRCS
2. Different raw materials used for detailed technology of manufacturing FRCS
3. Testing, analysis and detailed application FRCS

Module-1

Introduction to composites. Basic nomenclatures – reinforcing phase, continuous phase, matrix, interface etc. Classification of composites with respect to fibre used, matrix used, limitations of engineering metals.
Meaning of bio composites, advantages of bio composites. 3D fabrics for composites.

Module-2

Study of mechanical & thermal properties various fibres Viz. Carbon, glass, silicon carbide, boron, Kevlar, polyethylene, thiozole etc. used in the production of fibre reinforced composites.
Study of major natural fibres (coir, jute) which are used in the production of fibre reinforced composites. Advantages and disadvantages of natural fibres used in composites. Classification of resins, thermoset, thermoplastic metal matrix and their production properties, advantages, disadvantages (phenolic, epoxy, polyester, vinyl esters).

Module-3

Composites manufacturing techniques-Introduction-Meaning of interphase, types of bond set interphase, meaning of lamina, laminates, and representation of laminates. Pre-peg technology, Hand lay-up-spray-up - filament winding.
Compression moulding, injection moulding, poltrusion techniques. Brief outline of mechanical and thermal properties of various composites viz. Glass, boron, carbon, aramid.

Module-4

Brief outline on testing of composites - Characterization of physical constituents of composites - composite density, fibre volume fraction, void content.
Testing of tensile strength of composites, 3 & 4 point bending of composites, comparison testing of composites. NDT tests of composites.
Composite mechanics-failure mechanism in composites. Derivations of various equations related to composite structures viz. Axial modulus, transverse modulus, breaking strength of continuous filament, reinforced composites, effect of volume of fibres on mechanical properties of fibre reinforced composites. Fatigue and creep process in fibre reinforced composites.

Module-5

Study of various applications of composites mainly in the field like Aero plane, aerospace, medical, sports, ship building automobiles and industries.

Course Outcomes:

1. This course prepares students to understand unconventional application textile fibres
2. Students will be able to take up research work in fields of high performance fibres and material science
3. Students can make their career in DRDO, NAL and other defense related areas

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**Fibre Reinforced Material Technology**	N.J.Parratt	Van Nostrand Reinhold Co, Inc	1972
2	**High Performance Fibre Composites**	J.H.Morely	Academic Press	
3	**Composite materials**	Krishan K. Chawla	Springer	2005
4	**High Performance Fibres**	J.W.S. Hearle	Woodhead UK	2005
Reference Books				
5	**DST-polymers and composites-Recent trends-Proceedings of National Seminar**		Oxford IBH Pub Co Pvt. Ltd	1989
6	**Composites Engineering Hand Book**	Ed. Mallik P.K., Marcell Dekker	N.Y	1997

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SEMESTER - VII

SMART TEXTILES

Course Code	**18TX743**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives :

1. Recall and Recognize smart technology for textiles and clothing.
2. Recognize and demonstrate the intelligent systems of incorporating the sensor, processor and the actuator into textiles.
3. Define, Recognize and demonstrate PCMs and their properties and uses.
4. Recognize and apply and analyze the functions and applications of smart textiles.

Module-1

Smart technology for textiles and clothing – Introduction and Overview, development of smart technology for textiles and clothing – sensors/actuators, for signal transmission, processing and controls.
Electrically active polymer materials – concepts of autonomic systems and materials, polymer materials as actuators or artificial muscle, peculiarity of polymer gel actuator, triggers for actuating polymer gels, electro-active polymer gels as artificial muscles, from electro-active polymer gel to electro-active elastomer with large deformation.

Module-2

Introduction to phase change materials – Heat balance and thermo-physiological comfort, phase change technology, PCMs in textiles, textile treatment with PCM microcapsules, thermal performance, test methods, applications, future prospects of PCM in textiles and clothing.
Intelligent textiles with PCMs – Basic information on PCMs, phase change properties of linear alkyl hydrocarbons, textiles containing PCM, Functions of Textile Structure with PCM.

Module-3

Mode of PCM performance in clothing, Manufacturing of textiles containing micro PCMs, Applications of textiles containing PCMs are Domestic textiles, Medical products, Automotive textiles, Air conditioning buildings with PCMs.
Tailor made intelligent polymers for biomedical applications- Introduction, Fundamentals aspects of shape memory materials, concepts of biodegradable shape memory polymers, degradable thermoplastics elastomers having shape memory properties, degradable polymer networks having shape memory properties.

Module-4

Embroidery and Smart textiles – Introduction, basics of embroidery technology – combined embroidery techniques.
Embroidery machines, Embroidery for technical applications – tailored fibre placement, Embroidery technology used for medical textiles. Embroidered stamp – gag or innovation.
Adaptive and responsive textile structures – Introduction, textiles and computing – the symbiotic relationship, the three dimensions of clothing and wearable information infrastructure, textiles and information processing, Georgia tech wearable motherboard,

Module-5

Wearable technology for snow clothing. Bio-processing for smart textiles and clothing - treatment of wool with enzymes, treatment of cotton with enzymes, enzymatic modification of synthetic fibres, spider silk, intelligent fibres.
Textile scaffolds in tissue engineering – ideal scaffold system, scaffold materials, textile scaffolds.

Course Outcomes: On completion of this course, Students will be able to

1. Learn the various aspects of smart and intelligent textiles.
2. Gain knowledge about the incorporation of smart elements in textile substrates.
3. Will be able to take up project and research work in emerging areas smart textile.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	Smart fibres, fabrics and clothing	Xiaoming Tao	Woodhead Publishing Limited, Cambridge, England.	2005
2	Intelligent textiles and clothing	H.R.Mattila	Woodhead Publishing Limited, Cambridge, England.	2006
Reference Books				
3	Wearable electronics and photonics	By Xiaoming Tao	Woodhead Publishing Limited, Cambridge, England.	2005
4	New fibres	Tatsuya Hongu and Glyn O Phillips	Woodhead Publishing Limited, Cambridge	2004

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SEMESTER - VII

TOTAL QUALITY MANAGEMENT

Course Code	**18TX751**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning objectives :

The objective of this course is to make students understand the concepts of total quality management and its applications in textile and garment industries. This will enable them to study the quality aspects related to textiles and garments and help them obtain maximum benefits by applying TQM concepts in their work environment.

Module-1

Introduction to TQM. Quality movement in Japan, US & India. Definition of quality. Small q & Big Q, Quality characteristics - Views, Dimensions, Determinants. Quality & Profitability.

PRINCIPLES OF TOTAL QUALITY, Evolution of total quality and control.

TQM - Basic concepts & overview. Necessity of TQM. Elements of TQM, benefits of TQM, TQM in services, ISO 9000 & ISO 14000 in quality management system

Module-2

QUALITY & MANAGEMENT PHILOSOPHIES -Deming Philosophy-Chain reaction, 14 points for management, triangle theory of variance, deadly diseases & sins, Deming's wheel.

Juran's Philosophy - 10 steps for quality improvement, quality trilogy, universal breakthrough sequence.

Crosby Philosophy-Crosby's 6 C's, Absolutes of quality, Crosby's 14 points for quality, Crosby triangle. Comparison of 3 major quality philosophies.

Module-3

MANAGING QUALITY- traditional Vs Modern quality management, the quality planning, road map, the quality cycle. Cost of quality- Methods to reduce cost of quality, Sampling plans, O.C. curve.

QUALITY CONTROL - Objectives of quality control, Strategy & policy. Company wise quality control. Quality Assurance- Definition, concepts & objectives. Economic models for quality assurance. Statistical methodology in quality assurance. Process capability ratio, 6 sigma in quality assurance.

Module-4

FOCUSSING ON CUSTOMER- Importance of customer satisfaction, Kano's model of customer's satisfaction, customers driven quality cycle, understanding customer's needs & wants, customer's retention.

LEADERSHIP- Introduction, characteristics of quality leaders, role of TQM in leadership. Tools &Techniques of TQM, Just in time system-Concepts, objectives, overview, characteristics, benefits. Benchmarking- Introduction, process of bench marking, benefits, advantages & limitations.

Module-5

SUPPLY CHAIN MANAGEMENT- Objectives, process tools, supply chain management for manufacturing organization & service organization.

World class manufacturing - becoming world class, relevance of TQM in world class manufacturing. World class supplier, world class customer, present global business conditions, world class companies in 21st century.

Course Outcomes:

1. This subject helps the student to acquire the concepts of total quality management tools
2. This subject prepares the student apply TQM concepts in textile/garment manufacturing industries
3. Students are exposed to TQM principles and concepts so that they apply these concepts in the actual work environment for maximum benefits.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**Total Quality Management**	K. Shridhara Bhat	Himalaya Publishing House	2010
2	**Total Quality Management**	N.V.R. Naidu, K.M. Babu	New age international publishers	
Reference Books				
3	**Norms For Spinning**	Weaving and Processing	ATIRA Publication, Ahmadabad	1990
4	**Handbooks manuals**		BIS, ASTM, ISO-9000	

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SEMESTER - VII

RETAIL MANAGEMENT

Course Code	**18TX752**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives :

- To develop an understanding of the contemporary retail management, issues, strategies and trends.
- To highlight the importance of retailing and its role in the success of modern business.
- To acclimatize with the insights of retailing, key activities and relationships.

Module-1

Introduction and Perspectives on Retailing World of Retailing, Retail management, introduction, meaning, characteristics, emergence of organizations of retailing - Types of Retailers (Retail Formats) - Multichannel Retailing -Customer Buying Behaviour, Historical Perspective, role of retailing, trends in retailing, FDI in Retail - Problems of Indian Retailing - Current Scenario

Module-2

Marketing**:** Retailing, Role, Relevance & Trends. Retail Customer, Retail market segmentation &franchising, Relationship marketing in Retailing., Social Marketing in Retail management
Strategic management**:** Retail in India, Services marketing and Management, International/Strategies, Pricing, Advertising & sales promotion.

Module-3

Retailing strategy for Setting up Retail organization and planning**:** Retail Market Strategy -
Financial Strategy - Site & Locations (Size and space allocation, location strategy, factors
Affecting the location of Retail, Retail location Research and Techniques, Objectives of Good store Design.) – Human Resource Management, Information Systems and supply chain management & Logistics.
Retail Pricing and Promotion**:** Factors influencing retail pricing, Retail pricing strategies,
Retail promotion strategies.

Module-4

Store Management and Visual Merchandising**:**
Store Management: Responsibilities of Store Manager, Store Security, Parking Space Problem at Retail Centres, Store Record and Accounting System, Coding System, Material Handling in Stores, Management of Modern retails –Store Layout, design: Types of Layouts, role of Visual Merchandiser, Visual Merchandising Techniques, Controlling Costs and Reducing Inventories Loss, Exteriors, Interiors Customer Service, Planning Merchandise Assortments -Buying systems-Buying merchandise and Retail Communication Mix

Module-5

Retail Audit and ethics in Retailing: Undertaking an audit, responding to a retail Audit, problems in conducting a retail audit. Ethics in retailing, social responsibility and consumerism
Retail Life Cycle – Innovation / Acceleration / Maturity / Decline, Multi-Channel Retailing.

Course Outcomes:

- Find out the contemporary retail management, issues, and strategies.
- Evaluate the recent trends in retailing and its impact in the success of modern business.
- Relate store management and visual merchandising practices for effective retailing.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year

Textbook/s				
1	Retail Management- A strategic Approach	Alibris, Prentice Hall		2006
2	Retail Management	Levy and Weitz	McGraw Hill	
3	Retail Management	Chetan Bajaj	Oxford University press	
4	First Steps In A Retail Career	Wrice Mark	Macmillan Publishers Australia	
5	The Art of Retailing	A. J. Lamba	McGraw Hill	
Reference Books				
6	Marketing Management	R. Saxena		
7	Principles of Retail Management	Rosemary Varley, Mohammed	Palgrave Macmillan	2009
8	Managing Retailing	Sinha, Piyush Kumar	Oxford University Press	2010

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SEMESTER - VII

SILK APPAREL MARKETING AND MERCHANDIZING

Course Code	**18ST753**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:
The objective of this course is to make students understand the basic concepts of silk apparel production methods and their marketing aspects. This will enable them to study silk apparel marketing channels, merchandising concepts, sourcing silk apparels, standards for silk products etc.

Module-1

ORGANIZATION OF THE APPAREL BUSINESS- Nature of Apparel, Organization of the Apparel Industry- Business Concepts Applied to the Apparel Industry- International Issues- Cooperation in Manufacturing and Distribution.
Silk: Specialty of Silk products, types, silk made ups.

Module-2

MARKETING OBJECTIVES AND STRATEGIES IN SILK INDUSTRY-Functional organization of an apparel firm, responsibilities of marketing division strategic plan, marketing objectives & strategies, Retail and Wholesale Strategies of Silk Merchandise Distribution-Silk Products labelling and licensing.

Module-3

MERCHANDISING STRATEGIES FOR SILK PRODUCTS & PROCESSES- Concepts silk apparel production lines, dimensions of product change, nature & timing of merchandising responsibilities, business & marketing plans, line planning, line development line presentation, sourcing.
SILK PRODUCTS STANDARDS AND SPECIFICATIONS: Sources of Silk Products and Quality Standards- Standards for Quality, Fit, and Performance- Use of Specifications- Writing Specifications for apparel manufacturing

Module-4

SILK APPAREL DESIGN: Product Development and the Design Function- Role of Product Change in the Design Process- Post adoption Style. Development of Silk Apparel Design Technology.
EXPORT MARKETING OF SILK PRODUCTS: Outlook for export marketing, International agreement & agencies for promoting exports. Export import policy. Export assistance. Current pattern of India's foreign & world trade, Export barriers-tariff & non-tariff, Export Assistance.

Module-5

Silk Export marketing channels, physical distribution- transportation, packaging & marine insurance for exports.
Management of risk & export financing, Quality control & pre-shipment inspection, documents for exports.
An Introduction to retail marketing in silk apparels. Consumer behavior& retail operation. The retail marketing mix.
Management of a retail brand. Application of IT in silk products retail marketing.

Course Outcomes: On completion of this course, Students will be able to:
1. Learn the importance of Industrial engineering department.
2. Gain knowledge about the position of industrial engineering department.
3. Will be able to understand the concept of this scientific tool.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				

1	Production and Operations Management	R.PaneerSelvam	Prentice Hall of India	2002
2	Strategic operations Management	Robert H. Lowson	Vikas Publishing House	2003
Reference Books				
3	Production and operations management	Thomas E Morton	Vikas Publishing House, First Indian reprint	2003
4	Computer Aided Production Management	Mahapatra P B	Prentice Hall of India	2001
5	Production Management	Martand T Telsang	S Chand and Company	2003

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SEMESTER - VII

SILK REELING TECHNOLOGY LAB

Course Code	**18STL76**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(0:2:2)	SEE Marks	60
Credits	02	Exam Hours	03

Course Learning Objectives:

- To learn the identification of different types of cocoons. Reeling of silk on different machines, testing and grading of silk.

Sl. No.	Experiments
1	Identification of defective cocoons.
2	Identification of different silk cocoons & sorting of cocoons
3	Measurement of renditta and denier.
4	Measurement of shell ratio.
5	Reeling of silk on silk reeling machine on charka, multi-end reeling machine
6	Rewinding tests on silk winding machine
7	Raw silk testing & grading
8	Twisting of silk on two for one twister.
9	Demonstration of cocoon stifling and reeling of silk automatic filature machine.
10	Testing of silk yams for its quality

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

- Students are able to identify different types of cocoons
- Students to learn the analysis testing and grading of silk

Conduct of Practical Examination:

1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

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SEMESTER - VII

FASHION DESIGN AND GARMENT MANUFACTURE LAB

Course Code	**18TXL77**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(0:2:2)	SEE Marks	60
Credits	02	Exam Hours	03

Course Learning Objectives:
Study about various sewing machines and tools and equipment used for measuring, marking and cutting for making a garment, and learn about accessories used in garment industry.

Sl. No.	Experiments
1	Introduction to Sewing machine.
2	Study of different types sewing machines
3	Study of basic components of sewing machine.
4	Study of different type's stitches and seams.
5	Study of tools and equipment used
6	Study of rule of proportions (Human body and Head Theory)
7	Types of measurements. Techniques of body measurements.
8	How to take body measurements. Study of various buttons, labels and decorative materials for
9	Study of various buttons, labels and decorative materials for their characteristics and
10	Practice of making a pattern of Bermuda and stitching
11	Practice of making a pattern of men's shirt and stitching
12	Practice of making a pattern of salwar kameez and stitching
13	Practice of making a pattern of kids wear and stitching
14	Study and Practice of computer aided marker preparation for Men's, Women's and Children's Wear.

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

- Students are able to understand the principle of working of different types sewing machines used in Industry.
- Students will learn how to take body measurement and draft the pattern and cutting.
- Students will learn the stitches, seams used to join the cut parts of garment.
- Students will learn to make individual patterns of men, women and kids garment.

Conduct of Practical Examination:

1. All laboratory experiments are to be included for practical examination.
2. Breakup of marks and the instructions printed on the cover page of answer script to be strictly adhered by the examiners.
3. Students can pick one experiment from the questions lot prepared by the examiners.
4. Change of experiment is allowed only once and 15% Marks allotted to the procedure part to be made zero.

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SEMESTER - VII

PROJECT WORK PHASE - 1

Course Code	**18TXP77**	CIE Marks	100
Teaching Hours/Week (L:T:P)	(0:0:2)	SEE Marks	--
Credits	01	Exam Hours/Batch	--

Course Learning Objectives:

- To support independent learning and innovative attitude.
- To guide to select and utilize adequate information from varied resources upholding ethics.
- To guide to organize the work in the appropriate manner and present information (acknowledging the sources) clearly.
- To develop interactive, communication, organisation, time management, and presentation skills.
- To impart flexibility and adaptability.
- To inspire independent and team working.
- To expand intellectual capacity, credibility, judgement, intuition.
- To adhere to punctuality, setting and meeting deadlines.
- To instil responsibilities to oneself and others.
- To train students to present the topic of project work in a seminar without any fear, face audience confidently, enhance communication skill, involve in group discussion to present and exchange ideas.

Project Work Phase - II: Each student of the project batch shall involve in carrying out the project work jointly in constant consultation with internal guide, co-guide, and external guide and prepare the project report as per the norms avoiding plagiarism.

Course Outcomes:

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

- Present the project and be able to defend it.
- Make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task.
- Habituated to critical thinking and use problem solving skills.
- Communicate effectively and to present ideas clearly and coherently in both the written and oral forms.
- Work in a team to achieve common goal.
- Learn on their own, reflect on their learning and take appropriate actions to improve it.

CIE procedure for Project Work Phase - 1:

(i)Single discipline: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide.

The CIE marks awarded for the project work phase -1, shall be based on the evaluation of project work phase -1 Report, project presentation skill and question and answer session in the ratio 50:25:25.The marks awarded for the project report shall be the same for all the batch mates.

(ii) Interdisciplinary: Continuous Internal Evaluation shall be group wise at the college level with the participation of all guides of the college. Participation of external guide/s, if any, is desirable.

The CIE marks awarded for the project work phase -1, shall be based on the evaluation of project work phase -1 Report, project presentation skill and question and answer session in the ratio 50:25:25.The marks awarded for the project report shall be the same for all the batch mates.

VIII SEMESTER

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SEMESTER - VIII

APPAREL TESTING AND QUALITY CONTROL

Course Code	**18TX81**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:
The objective of this course is to make students understand the importance of textile testing and quality control in the manufacture of apparels in apparel industry. Students are trained to understand various methods and instruments used for testing/inspection of fabrics, garments and other accessories. Students are to study testing of the yarns, fabrics, garments and other accessories for various properties,

Module-1

Comfort: Air permeability, thermal conductivity, water vapour permeability, static electricity.
Seam slippage & seam strength, seam efficiency launderability. Fabric stretch properties, durable press & apparel needle cutting.

Module-2

Fabric handle and easy care: low stress mechanical properties by KESF system and FAST system. Fabric handle & application of test results in garment manufacturing. Sewability, Crease resistance, shrinkage, pilling & snagging properties.

Module-3

Inspection: Raw material- fabric sewing threads, zippers, buttons & accessories. In-process inspection- spreading, cutting, sewing. Defects in spreading, cutting, sewing. Final inspection- how much to inspect, inspection methods and acceptance criteria.

Module-4

Quality of accessories: Testing of bonded & laminated fabrics, testing of fusible interlinings, elastic waist band, zippers. Properties of sewing threads.
Colour fastness tests – wash fastness, light fastness, rubbing fastness colour measurement. Effects of light intensity, angle of illumination and type on the apparent shade of a sample.

Module-5

Quality control and specifications: Quality control in the sampling/development department. Examples of garment specification, Seam specification examples, Performance specification.
Quality costs, customer returns, product liability, seven tools of QC, ISO9000 Series of standards, current concepts in quality control.

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

1. Testing of yarns, fabrics and other accessories
2. Method and principle involved in inspection/testing of fabric, zippers, buttons, sewing threads etc.
3. Instruments used and the principle of working
4. Understand the quality parameters of textile materials

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				

1	**Physical testing of textiles**	B.P. Soville	Wood Head	1999
2	**Principles of Textile Testing**	Booth J. E	Butterworth, Wendon III Edition	1996
3	**Handbook of Textile Testing and Quality Control**	Grover and Hamby	Wiley Eastern Pvt. Ltd., New Delhi	1969
4	**Physical Properties of textile fibres**	Morton and Hearle	The Textile Institute, Manchester.	2008
2	**The measurement of Appearance**	Richard S. Hunter and Richard W. Harold	Wiley Inter Science.	
Reference Books				
5	**International Apparel Quality manuals**		KES- F and FAST manuals	
6	**Progress in Textile science and technology**	V.K. Kothari,	IAFL, India	2000
7	**B.I.S. Handbook**	BIS	BIS publications	2000
8	**B.S. Handbook**	G. Weston	BS publications	2009
9	**Textile Testing**	James Lomak, Longmans	Green and Co. London	2002
10	**ASTM standard**	ASTM USA	ASTM publication	1985

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SEMESTER - VIII

HUMAN RESOURCE MANAGEMENT

Course Code	**18TX821**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives :

- To understand the HRM concepts and theory.
- To obtain an overview of various HRM functions and practices.
- To gain an insight into the various statutory provisions.

Module-1

Human Resource Management: Introduction, meaning, nature, scope and objectives of HRM, Difference between Personnel management and HRM - Importance and Evolution of the concept of HRM - Major functions of HRM - Principles of HRM and impact on Textile Industry

Module-2

Environment and Strategies of HRM: Introduction, Strategic management process, Organizational and human resource strategies.
Job design, Job analysis, Job description, job specifications and job Evaluation. Uses of job analysis.
Human Resource Planning: Introduction, process and levels of HRP.

Module-3

Recruitment**:** Definition, Constraints and Challenges, Sources and Methods of Recruitment.
Selection**:** Definition and Process of Selection.
Placement, Induction.
Significance, Need, Objectives, Scope and Concept of Human Resource Development.

Module-4

Training: Definition, Stages of training personnel for higher performance and productivity. Different types of evaluation, basis of promotion, demotion, transfers.
Performance Appraisal**:** Meaning, need of Performance Appraisal, Concept of Performance Appraisal, the Performance evaluation, Methods of Performance Appraisal.

Module-5

Employee Grievances: Employee Grievance procedure, Grievances Management in Indian Industry.
Discipline**:** Meaning, approaches to discipline, essential of a good disciplinary system.
Recent trends in HRM: Employer's brand, Competency mapping, Business process outsourcing (HR issues).
Knowledge management meaning and benefits.

Course Outcomes:

- Synthesize information regarding the effectiveness of recruiting methods & selection procedures
- Identify the various training methods and design a training program
- Knowledge of designing job description and job specification for various levels of employees.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	Human Resource Management and Industrial Relations	Dr. P. Subba Rao	Himalaya Publishing House, Mumbai.	2009

2	Personal Management	Edvin B. Flippe		
3	Human Resources Management	Rao V. S. P	Excel BOOKS	2010
4	Personal Management	Subratha Ghosh		
5	Human Resource Management	Lawrence S. Kleeman	Biztantra	2012
6	Human Resource Management	Dr. T.P Renuka Murthy	HPH	
7	Personal Management	Duck Torington		
Reference Books				
8	Human Resource Management & Industrial relations	P. Subba Rao	Himalaya Publishing House, Mumbai.	2009
9	Management of personnel in India	N.N Chatterjee		
10	Human Resource Management in practice	Luis R Gomez-Mejia, David B. Balkin	PHI	2010

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SEMESTER - VIII

NON MULBERRY SILKS AND SILK BY-PRODUCT TECHNOLOGY

Course Code	**18ST822**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:

- The objective of this course is to make students understand the basic concepts non-mulberry silk rearing and reeling methods to effectively produce various non-mulberry silks. This subject will also enable the students to understand various by-products produced in sericulture and silk industry and their utilization in various fields.

Module-1

Scope for non-mulberry silk in India, mulberry Vs. non-mulberry. India's non-mulberry silk potential.
TASAR SILK: Prerequisites for expansion tasar silk in India. Verities of tasar silk, morphology, anatomy and tasar cocoon production.
Tassar silk reeling technology: reeling machines used, developments in reeling techniques. Applications of tasar silks.

Module-2

MUGA SILK AND ERI SILK: scope of these silk in Assam & other north eastern states. Morphology, anatomy & rearing methods for Muga and Eri silks.
Muga silk reeling & developments in silk reeling techniques.
Eri silk reeling & developments in silk reeling techniques. Applications of Muga and Eri silks.

Module-3

SPIDER SILK: production of spider silk yarn, utilization in spider silk in technical textiles. Properties of spider silks. Applications of spider silks in biomedical applications.
Diseases & pests for non-mulberry silk-causes & remedies.
Dupion silk: Introduction, reeling and end uses.
Noil Yarns: Types, production, uses**.**

Module-4

Introduction to by-products of sericulture and silk industry.
Classification of silk waste. Sources & utilization of silk waste – silk worm pupae, basin refuge, cut & pierced cocoons, double cocoons, and reeler's waste. Utilization of waste cocoons

Module-5

Spun silk manufacturing: Preparatory, spinning, doubling, twisting and finishing processes.
Utilization of pupae - drying, oil extraction, application in food products and biofuel production.
Marketing & entrepreneurship development in silk by-product industry.

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

- This subject helps the student to acquire the concepts of rearing of non-mulberry silks and their production in detail.
- This subject prepares the student to understand and practice production of silk silk yarns, noil yarns and other fancy silk yarns produced from silk waste.
- Students are exposed to various by-products of sericulture and silk industry and their utilization in various fields.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	Handbook of Practical Sericulture	S R Ullal and M. N Narasimhanna	Central Silk Board	1981
2	Hand book of silk Technology	T.N. Sonwalkar	New Age International (P) Limited	2001
3	Mulberry silk Reeling Technology	D.Mahadevappa , V.G. Malliyal, D.G. Shankar	Oxford and IBH Publishing co. Pvt. Ltd	1992
Reference Books				
4	Handbook of Sericulture Technologies	S.B.Dandin	Certral Silk Board	2003

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SEMESTER - VIII

TECHNICAL TEXTILES

Course Code	**18TX823**	CIE Marks	40
Teaching Hours/Week (L:T:P)	(3:0:0)	SEE Marks	60
Credits	03	Exam Hours	03

Course Learning Objectives:

The objective of this Course is to make students understand:

1. Basics of technical textiles
2. Different types of technical textiles
3. Various fibres and fabrics used for production of technical textiles
4. Various applications of technical textiles in industries.

Module-1

INTRODUCTION TO TECHNICAL TEXTILES. Requirements of fibres, yarns and fabrics for technical textiles. Classification of technical textiles. Study of properties of various fibres used for technical textiles.
AGROTECH: Textiles used for agriculture, Horticulture and animal husbandry.
MOBIL TECH - AUTOMOTIVE TEXTILES - Use of textiles in tyres, requirements of fibres used for tyres, various fibres used for tyre cords, tire building, different types of tyres.
Upholstery in automobiles: vehicle top covers, seat covers, headliners, carpets etc.
Safety devices in automobiles: seat belts, airbags, helmets etc.
Textiles used in Aerospace industry.

Module-2

MEDICAL TEXTILES: Medical application of Textiles, requirements, classification, detailed study of application of textiles in implantable, non-implantable, extra corporal devices and health care hygienic products.
GEO TEXTILES: Definition, textile fibres and fabrics used, functions of geo-textiles. Applications of geotextiles and geomembranes in civil engineering i.e. roads, railways, bridge, dam construction, soil erosion etc.

Module-3

TEXTILES IN FILTERATION: Introduction, types of filtration requirements, filtration mechanisms, Effect of yarns and fabric construction on filtration. Methods/types of filtration.
COATED FABRICS: Introduction, chemistry of coated textiles, thermoplastic polymers for coating, coating techniques, fusible interlining.

Module-4

SMART TEXTILES: Introduction, concept of smart textiles, various applications of smart textiles. Introduction to nanotechnology in textiles. Application of Nano textiles in various field. Production and properties of Nanofibres. Fibre Reinforced Composites – meaning, classification, brief outline on raw materials, production techniques and applications.

Module-5

TEXTILES IN DEFENSE: Introduction, historical back ground, criteria for modern military textiles, textiles for environmental protection, Ballistic protective materials, water proof materials, application of textiles in camouflage.
Application of Textiles in Packing, Power transmission, fish nets, sports.

Course Outcomes:

1. This subject helps the student to acquire knowledge of various technical textiles used in industries
2. This subject prepares the student work in technical textile manufacturing industry.
3. Students are exposed to research field in technical textiles and their applications in various industries.

Question paper pattern:

- The question paper will have ten full questions carrying equal marks. Each full question consisting of 20 marks.
- There will be two full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
Textbook/s				
1	**Hand book of Technical Textiles**	A.R.Horrocks, S.C. Anand	Wood Head Pub., England	2000
2	**Hand book of Industrial Textiles**	S. Adanur	Lancaster-Basel	1995
3	**Smart Fibres - Fabrics & Clothing**	Xiaoming Tao	Wood Head Pub., England	2001
4	**Design of Textiles For Industrial**	P.W. Harrison	Textile Institute, Manchester	1977
Reference Books				
5	**Hand book of Industrial Textiles**	R. Kaswell	Willington, New York	1963
6	**Industrial Textiles**	P.K.Badami		
7	**International Seminar on Technical Textiles**	SASMIRA	SASMIRA	2000

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SEMESTER - VIII

PROJECT WORK PHASE -II

Course Code	**18TXP83**	CIE Marks	40
Contact Hours/Week	02	SEE Marks	60
Credits	08	Exam Hours/Batch	03

Course learning Objectives:

- To support independent learning and innovative attitude.
- To guide to select and utilize adequate information from varied resources maintaining ethics.
- To guide to organize the work in the appropriate manner and present information (acknowledging the sources) clearly.
- To develop interactive, communication, organisation, time management, and presentation skills.
- To impart flexibility and adaptability.
- To inspire independent and team working.
- To expand intellectual capacity, credibility, judgement, intuition.
- To adhere to punctuality, setting and meeting deadlines.
- To instil responsibilities to oneself and others.
- To train students to present the topic of project work in a seminar without any fear, face audience confidently, enhance communication skill, involve in group discussion to present and exchange ideas.

Project Work Phase - II: Each student of the project batch shall involve in carrying out the project work jointly in constant consultation with internal guide, co-guide, and external guide and prepare the project report as per the norms avoiding plagiarism.

Course Outcomes:

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

- Present the project and be able to defend it.
- Make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task.
- Habituated to critical thinking and use problem solving skills
- Communicate effectively and to present ideas clearly and coherently in both the written and oral forms.
- Work in a team to achieve common goal.
- Learn on their own, reflect on their learning and take appropriate actions to improve it.

CIE procedure for Project Work Phase - 2:

(i)Single discipline: The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide.

The CIE marks awarded for the project work phase -2, shall be based on the evaluation of project work phase -2 Report, project presentation skill and question and answer session in the ratio 50:25:25.The marks awarded for the project report shall be the same for all the batch mates.

(ii) Interdisciplinary: Continuous Internal Evaluation shall be group wise at the college level with the participation of all guides of the college. Participation of external guide/s, if any, is desirable.

The CIE marks awarded for the project work phase -2, shall be based on the evaluation of project work phase -2 Report, project presentation skill and question and answer session in the ratio 50:25:25.The marks awarded

Semester End Examination

SEE marks for the project (60 marks) shall be awarded (based on the quality of report and presentation skill, participation in the question and answer session) as per the University norms by the examiners appointed VTU.

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SEMESTER - VIII

TECHNICAL SEMINAR

Course Code	**18TXS84**	CIE Marks	100
Contact Hours/Week	02	SEE Marks	--
Credits	01	Exam Hours	--

Course Learning Objectives:

The objective of the seminar is to inculcate self-learning, face audience confidently, enhance communication skill, involve in group discussion and present and exchange ideas.

Each student, under the guidance of a Faculty, shall choose, preferably, a recent topic of his/her interest relevant to the Course of Specialization.

- Carryout literature survey, organize the seminar content in a systematic manner.
- Prepare the report with own sentences, avoiding cut and paste act.
- Type the matter to acquaint with the use of Micro-soft equation and drawing tools or any such facilities.
- Present the seminar topic orally and/or through power point slides.
- Answer the queries and involve in debate/discussion.
- Submit typed report with a list of references.

The participants shall take part in discussion to foster friendly and stimulating environment in which the students are motivated to reach high standards and become self-confident. ■

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

- Attain, use and develop knowledge in the field of engineering and other disciplines through independent learning and collaborative study.
- Identify, understand and discuss current, real-time issues.
- Improve oral and written communication skills.
- Explore an appreciation of the self in relation to its larger diverse social and academic contexts.
- Apply principles of ethics and respect in interaction with others.■

Evaluation Procedure:

The CIE marks for the seminar shall be awarded (based on the relevance of the topic, presentation skill, participation in the question and answer session and quality of report) by the committee constituted for the purpose by the Head of the Department. The committee shall consist of three teachers from the department with the senior most acting as the Chairman.

Marks distribution for CIE of the course:

Seminar Report: 50 marks

Presentation skill: 25 marks

Question and Answer: 25 marks.■