

MANAGEMENT AND ENTREPRENEURSHIP IN TEXTILE INDUSTRY		Semester	V
Course Code	BTX501	CIE Marks	50
Teaching Hours/Week (L: T:P: S)	3:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40-45	Total Marks	100
Credits	03	Exam Hours	03
Examination nature (SEE)	Theory		
Course 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.			
Teaching-Learning Process (General Instructions)			
These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.			
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 outcome (Course Skill Set)

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.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

- For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks.
- The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered
- Any two assignment methods mentioned in the 22OB2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned.
- For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment.

Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (**duration 03 hours**).

- The question paper will have ten questions. Each question is set for 20 marks.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
- The students have to answer 5 full questions, selecting one full question from each module.
- Marks scored shall be proportionally reduced to 50 marks

Suggested Learning Resources:**Text Books:**

1. Principles of management by Tirpathi P.C and P.N.Reddy MCgraw Hill education 2012
2. Entrepreneurship by Poornima Charinthimath Pearson india Ltd. 2005
3. Management by P.N.Reddy
4. Management & Entrepreneurship by Prof: Ramesh Burbure Rohan publishers 2008

REFERENCES::

1. Project management and control by Narendra Singh Himalaya publishing house 2005
2. Work Quality management in textile industry by B. Purushottam Woodhead publishing Ltd.

Web links and Video Lectures (e-Resources):

- **NPTEL video on Innovation, Business Models and Entrepreneurship**

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

FASHION DESIGN AND GARMENT MANUFACTURE		Semester	V
Course Code	BTX502	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	3:0:2:0	SEE Marks	50

Total Hours of Pedagogy	40 hours Theory + 8-10 Lab slots	Total Marks	100
Credits	04	Exam Hours	03
Examination nature (SEE)	Theory		
Course objectives:			
<ul style="list-style-type: none"> • This subjects deals with various aspects of Fashion Concepts, Fashion theories and design elements consumer expectation about textiles. • Sourcing, issues, fabric inspection, procedures, spreading and cutting, different types of sewing machines, seams and stitches, pattern making & garment making process. • Production and planning, costing, industrial engineering, Garment inspection, SMV calculations. 			
Teaching-Learning Process (General Instructions)			
These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.			
<ol style="list-style-type: none"> 1. Apart from conventional lecture methods, various types of innovative teaching techniques through videos, animation films may be adopted so that the delivered lesson can progress the students in theoretical, applied and practical skills. 2. Seminars and Quizzes may be arranged for students in respective subjects to develop skills. 3. Encourage the students for group learning to improve their creativity and analytical skills. 4. Arrange visits to nearby garment industries to learn garment processes. 5. Encourage the students to learn pattern preparation, sewing machine operations, and accessories adgarment finishing operations. 			
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.			
MODULE-2			
Sourcing, Global sourcing, Role of sourcing discussion in Apparel firms. Material sourcing process. Fabric inspection methods. Principle and 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. Workaids, puckering, reasons and remedies. Seam strength, seam efficiency, seam slippage - importance and measurement. Sewability, formability. Needle cutting.			
MODULE-4			
Pressing and Fusing processes - Equipment's, methods, support materials. Lining, Interlinings, Closures. Zippers, Buttons, trims, snaps, Hooks, loop tape, Elastics, embroidery etc Apparel productionsystems. Garment Quality control, Inspection of garments under different AQL standards.			
MODULE-5			
Concept of production planning, productivity, resource management, Ergonomics, Apparel Engineering, basic concepts, workflow and work study techniques, SMV Calculation. Costing- Procedures, systems of costing, stages of costing, pricing strategies.			

PRACTICAL COMPONENT OF IPCC

Sl.NO	Experiments
1	Study of different types sewing machines

2	Study of basic components of sewing machine.
3	Study of tools and equipment used.
4	Types of measurements. Techniques of body measurements.
5	Practice of making a pattern of Bermuda and stitching.
6	Practice of making a pattern of men's shirt and stitching
7	Practice of making a pattern of salwar kameez and stitching.
8	Practice of making a pattern of kids wear and stitching.
9	Study and Practice of computer aided marker preparation for Men's, Women's and Children's Wear.
10	Different types of sewing M/c. Workaids, sewing threads.
11	Different types of sewing needles and support materials.
12	Pressing and fusing machines

Course outcomes (Course Skill Set):

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

- Develop the Knowledge on fashion, consumer expectation of Textiles, fashion cycle, theories, and factors influences, measurement techniques and fabric selection for different end uses.
- Develop the knowledge on global sourcing issues, fabric inspection, grading techniques and patternmaking techniques
- Illustrate the different types of stitches, seams and sewing machines and importance of seam strength, seam slippage, sew ability, and tailor ability and formability.
- Analyzing the importance of fusing, pressing, support materials and trims and garment inspection using AQL standards.
- Summarize the different apparel production techniques, quality control, and different types of garment finishing SMV calculations and costing of garments

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

CIE for the theory component of the IPCC (maximum marks 50)

- IPCC means practical portion integrated with the theory of the course.
- CIE marks for the theory component are **25 marks** and that for the practical component is **25 marks**.
- 25 marks for the theory component are split into **15 marks** for two Internal Assessment Tests (Two Tests, each of 15 Marks with 01-hour duration, are to be conducted) and **10 marks** for other assessment methods mentioned in 22OB4.2. The first test at the end of 40-50% coverage of the syllabus and the second test after covering 85-90% of the syllabus.

- Scaled-down marks of the sum of two tests and other assessment methods will be CIE marks for the theory component of IPCC (that is for **25 marks**).
- The student has to secure 40% of 25 marks to qualify in the CIE of the theory component of IPCC.

CIE for the practical component of the IPCC

- **15 marks** for the conduction of the experiment and preparation of laboratory record, and **10 marks** for the test to be conducted after the completion of all the laboratory sessions.
- On completion of every experiment/program in the laboratory, the students shall be evaluated including viva-voce and marks shall be awarded on the same day.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to **15 marks**.
- The laboratory test (**duration 02/03 hours**) after completion of all the experiments shall be conducted for 50 marks and scaled down to **10 marks**.
- Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IPCC for **25 marks**.
- The student has to secure 40% of 25 marks to qualify in the CIE of the practical component of the IPCC.

SEE for IPCC

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (**duration 03 hours**)

- The question paper will have ten questions. Each question is set for 20 marks.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
- The students have to answer 5 full questions, selecting one full question from each module.
- Marks scored by the student shall be proportionally scaled down to 50 Marks

The theory portion of the IPCC shall be for both CIE and SEE, whereas the practical portion will have a CIE component only. Questions mentioned in the SEE paper may include questions from the practical component.

Suggested Learning Resources:

Books

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, Oxford England 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.

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning
Students can be taken to garment manufacturing industry as a part of industrial visit.

SILK REELING TECHNOLOGY		Semester	V
Course Code	BST503	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	3:0:2:0	SEE Marks	50
Total Hours of Pedagogy	40 hours Theory + 8-10 Lab slots	Total Marks	100
Credits	04	Exam Hours	3

Examination nature (SEE)	Theory
<p>Course objectives:</p> <ul style="list-style-type: none"> • To make students understand the basic concepts of silk reeling technology. • This will enable them to study preparatory processes prior to silk reeling. • The course will help the students to understand detailed methods of pre-reeling, silk reeling and post reeling operations. 	
<p>Teaching-Learning Process (General Instructions) These are sample Strategies; that teachers can use to accelerate the attainment of the various course outcomes.</p> <ul style="list-style-type: none"> • Apart from conventional lecture methods, various types of innovative teaching techniques through videos, animation films may be adopted so that the delivered lesson can progress the students in theoretical, applied and practical skills. • Seminars and Quizzes may be arranged for students in respective subjects to develop skills. • Encourage the students for group learning to improve their creativity and analytical skills. • Support and guide the students for self-study. • Encourage students to observe working of various reeling machineries to understand mechanisms. • Actual production of silk can be demonstrated to students by taking them to reeling industries. • Students can be taken to research laboratories to demonstrate about modern machineries used for production of silk. 	
MODULE-1	
<p>Introduction to silk reeling. Status and distribution of mulberry silk reeling activities in India. Importance of mulberry silk cocoon quality, factors influencing quality of cocoon, Types of defective cocoons. Cocoon characteristics and their significance in silk reeling. Renditta and its estimation using cocoon characteristics. Pre-treatment of cocoons: Stifling of Cocoons-Objective, various methods, merits and de-merits. Cocoon storage, cocoon mixing, deflossing, riddling and cocoon sorting.</p>	
MODULE-2	
<p>Cocoon cooking – Objective, various methods such as open pan, three-pan, conveyor cooking etc., merits and demerits. Cocoon cooking for floating and sunken systems of reeling. Under cooking, over cooking and cooking efficiency.</p>	
MODULE-3	
<p>Silk Reeling. Process and Factors influencing silk reeling. Overview of silk reeling machinery & processes. Silk reeling machines: Salient features, passage of material and production aspects of country charka, cottage basin, multi-end filature, semi-automatic and automatic reeling machines. Working principle of Denier detector device and auto-casting device in automatic reeling machines. Permeation process for silk reels. Silk Re-reeling, Skein finishing & packing. Recent developments in reeling of silk.</p>	
MODULE-4	
<p>Post reeling processes (Silk Throwing) – objectives and importance. Sequence of operations in silk throwing - winding, doubling, re-winding and twisting. Manufacture of silk yarns for use in ordinary, chiffon, crepe, Georgette fabrics. Recent developments in silk throwing machinery.</p>	
MODULE-5	

Quality Control in Reeling: Characteristics of water, treatment methods for water for reeling. Water quality in reeling clusters. Water recycling in silk reeling.
Raw silk testing & grading: Seriplane testing equipment. National & International methods of testing & grading of raw silk.

Course outcomes (Course Skill Set):

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

- Acquire the concepts of silk reeling and preparatory processes prior to silk reeling, Identify different types of Cocoons. Evaluate the quality of cocoons and production calculations.
- Understand and practice of silk reeling as a small scale activity.
- Identify the components of reeling machines
- Exposed to various methods of silk reeling, post reeling processes, quality aspects of silk.
- Enable them to start a small-scale silk reeling industry.
- Illustrate methods of producing of silk filaments from cocoons.
- Learn the method of testing and grading of silk.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

- For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks.
- The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered
- Any two assignment methods mentioned in the 220B2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned.
- For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment.

Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (**duration 03 hours**).

- The question paper will have ten questions. Each question is set for 20 marks.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
- The students have to answer 5 full questions, selecting one full question from each module.

Marks scored shall be proportionally reduced to 50 marks.

Suggested Learning Resources:**Books**

7. Handbook of Silk Technology, T N Sonwalkar, Taylor and Francis, 1993
8. Mulberry Silk Reeling Technology, D. Mahadevappa, V G Halliyal, D G, Shankar, Ravindra, Bhandiwad, Oxford and IBH Publishing Company Pvt. Ltd, 2000
9. Silk Reeling and Testing Manual, Yong-woo Lee, National Sericulture and Entomology Institute, Seoul, Republic of Korea. FAO AGRICULTURAL SERVICES BULLETIN No. 136, FAO Publication, 1999.
10. Handbook of Sericulture Technologies, S.B. Dandin, Central Silk Board, 2003.

Web links and Video Lectures (e-Resources):

- Central Silk Board: <https://csb.gov.in/publications/>
- Karnataka State Sericulture Research and Development Institute: <https://kssrdi.karnataka.gov.in/english>
- Food and Agriculture Organization of the United Nations (FAO): <https://agris.fao.org/agris-search/search.do?recordID=XF7601187>

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- Collect various types of silk cocoons from nearby cocoon market and study their properties.
- Visit silk reeling industries to understand the silk reeling activities.
- Collecting various silk cocoons, raw silk yarns and silk yarn test reports from silk reeling industries/R&D centres and studying them.
- Seminars, quizzes, group discussions, seminars and report writing on auction process in cocoon market and silk exchange.
- Finding out various parameters of cocoons and silk filaments in textile testing laboratory / textile committee / central silk board / dept. of sericulture.

SILK REELING TECHNOLOGY LAB		Semester	V
Course Code	BSTL504	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	0:0:2:0	SEE Marks	50
Credits	01	Exam Hours	100
Examination nature (SEE)	Practical		
Course objectives:			
<ul style="list-style-type: none"> • To make students practically perform and understand sequence of different processes involved in silk reeling. • The course will help the students to practically understand methods of pre-reeling, silk reeling and post reeling operations. • This will enable them to practically study and evaluate cocoon quality and raw silk yarn quality along with assessment methods. 			
SLN	Experiments		
0			
1	Determination of cocoon driage % after styfling/drying the green mulberry silk cocoons.		
2	Determination of basic cocoon quality characteristics and Estimation of Renditta using cocoon quality parameters		
3	Determination of cocoon cooking efficiency using open (floating) cooking method.		

4	Determination of cocoon cooking efficiency using three pan (sunken) cooking method.
5	Determination of Reeling efficiency of mulberry silk cocoons
6	Determination of size (denier) deviation in raw silk yarn using silk kilchas (50 no.s of apx. 100-120 meters in each kilcha) and Determination of winding breaks in silk skeins for raw silk yarn quality assessment (silk winding process for 60 minutes at 100 meters/minute).
7	Determination of evenness and cleanliness defects in raw silk by preparing and using yarn appearance board.
8	Raw silk grading by determining tensile strength & elongation of silk yarn by testing and using other given data.
Demonstration Experiments (For CIE)	
9	Mulberry silk cocoon: identification of type, assessment of cocoon grading and identification/sorting of defective cocoons
10	Determination of brushing efficiency of cooked cocoons using stick & brush and estimation of silk waste during brushing process.
11	Determination of total silk waste generated during reeling process and preparation of silk sheets using pelade waste.
12	Raw silk testing and grading using Seriplane testing equipment.

Course outcomes (Course Skill Set):

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

- Acquire hands on practical's on silk reeling and preparatory processes prior to silk reeling, Identify different types of Cocoons. Evaluate the quality of cocoons and production calculations.
- Understand and practice of silk reeling as a small scale activity.
- Identify the different stages of silk reeling production and components of silk reeling machines
- Exposed to various methods of silk reeling, post reeling processes, quality aspects of silk.
- Illustrate methods of producing of silk filaments from cocoons.
- Learn the method of testing and grading of silk.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

Continuous Internal Evaluation (CIE):

CIE marks for the practical course are **50 Marks**.

The split-up of CIE marks for record/ journal and test are in the ratio **60:40**.

- Each experiment is to be evaluated for conduction with an observation sheet and record write-up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments are designed by the faculty who is handling the laboratory session and are made known to students at the beginning of the practical session.

- Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10 marks.
- Total marks scored by the students are scaled down to **30 marks** (60% of maximum marks).
- Weightage to be given for neatness and submission of record/write-up on time.
- Department shall conduct a test of 100 marks after the completion of all the experiments listed in the syllabus.
- In a test, test write-up, conduction of experiment, acceptable result, and procedural knowledge will carry a weightage of 60% and the rest 40% for viva-voce.
- The suitable rubrics can be designed to evaluate each student's performance and learning ability.
- The marks scored shall be scaled down to **20 marks** (40% of the maximum marks).

The Sum of scaled-down marks scored in the report write-up/journal and marks of a test is the total CIE marks scored by the student.

Semester End Evaluation (SEE):

- SEE marks for the practical course are 50 Marks.
- SEE shall be conducted jointly by the two examiners of the same institute, examiners are appointed by the Head of the Institute.
- The examination schedule and names of examiners are informed to the university before the conduction of the examination. These practical examinations are to be conducted between the schedule mentioned in the academic calendar of the University.
- All laboratory experiments are to be included for practical examination.
- (Rubrics) Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered to by the examiners. **OR** based on the course requirement evaluation rubrics shall be decided jointly by examiners.
- Students can pick one question (experiment) from the questions lot prepared by the examiners jointly.
- Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners.
- General rubrics suggested for SEE are mentioned here, writeup-20%, Conduction procedure and result in -60%, Viva-voce 20% of maximum marks. SEE for practical shall be evaluated for 100 marks and scored marks shall be scaled down to 50 marks (however, based on course type, rubrics shall be decided by the examiners)
- Change of experiment is allowed only once and 15% of Marks allotted to the procedure part are to be made zero.
- The minimum duration of SEE is 02 hours

Suggested Learning Resources:

Books

11. Handbook of Silk Technology, T N Sonwalkar, Taylor and Francis, 1993
12. Mulberry Silk Reeling Technology, D. Mahadevappa, V G Halliyal, D G, Shankar, Ravindra, Bhandiwad, Oxford and IBH Publishing Company Pvt. Ltd, 2000
13. Silk Reeling and Testing Manual, Yong-woo Lee, National Sericulture and Entomology Institute, Seoul, Republic of Korea. FAO AGRICULTURAL SERVICES BULLETIN No. 136, FAO Publication, 1999.
14. Handbook of Sericulture Technologies, S.B. Dandin, Central Silk Board, 2003.

ADVANCED YARN AND FABRIC MANUFACTURE		Semester	V
Course Code	BTX515A	CIE Marks	50
Teaching Hours/Week (L: T:P: S)	3:0:2:0	SEE Marks	50

Total Hours of Pedagogy	40-45	Total Marks	100
Credits	03	Exam Hours	03
Examination nature (SEE)	Theory		
Course objectives:			
<ul style="list-style-type: none"> • Explain the students the unconventional spinning techniques. • To understand the various modern spinning methods such as • Students will acquire theoretical knowledge about the machineries used. • Interpret and explain unconventional methods of weaving. 			
Teaching-Learning Process (General Instructions)			
<p>These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes:</p> <ol style="list-style-type: none"> 1. Apart from conventional lecture methods various types of innovative teaching techniques through videos, working models, animation films may be adopted so that the delivered less on can progress the students in theoretical, applied and practical skills. 2. Hands on training may be arranged for students to learn practical aspects. 3. Encourage the students to learn machinery operations various settings and maintenance of weaving machines. 4. Students can visit nearby weaving industries to learn more on advanced method of fabric manufacture methods. <p>Support and guide the students for self-study.</p>			
Module-1			
<p>Open-end spinning – principle and objects of open-end spinning. Classification of open-end spinning. Principle and Technique of rotor spinning and Rotor Spinning Raw material requirement and preparation; principle of operation - feeding, opening, cleaning, drafting, twisting and winding; process parameters influencing spinning performance and yarn quality; yarn structure, properties of ring and rotor spun yarns; limitations; applications, Latest developments in rotor spinning. Modern developments in OE machines. Calculation of Spindle Speed, Demonstration and calculation on O.E. Spinning machine.</p>			
Module-2			
<p>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.</p>			
Module-3			
<p>Friction Spinning Principle of opening, cleaning, drafting, twisting and winding in DREF II and DREF III spinning; structure, properties and applications of friction spun yarns.</p>			
Module-4			
<p>Air-Jet and Air-Vortex Spinning- Principles of drafting, twisting and winding in air-jet and air-vortex spinning; structure, properties and applications of air-jet and air-vortex yarns. Principle of yarn production in self-twist, wrap, core, Siro and solo spinning systems. Properties and applications. Yarn Plying and Fancy Yarns Merits of plying; methods of plying-TFO, ring twisting; selection of twist level for plying; calculation of resultant count of plied yarns; Fancy yarns-types and production methods, applications.</p>			
Module-5			
<p>Multiphase weaving, circulars looms, Narrow looms, Triaxial looms and applications.</p>			

Course outcome (Course Skill Set)

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

1. Demonstrate & Explain the Working Principle of OE Spinning Technology
2. Demonstrate the Working Principle of Air-jet spinning, vortex Machine & O.E.Spining.
3. self-twist, wrap, core, Siro and solo spinning systems
4. Explain the Production of Yarn on Unconventional Methods of Spinning Technology
5. Explain weft insertion stages in multiphase looms, Triaxial looms and circular looms.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

- For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks.
- The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered
- Any two assignment methods mentioned in the 22OB2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned.
- For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment.

Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (**duration 03 hours**).

- The question paper will have ten questions. Each question is set for 20 marks.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
- The students have to answer 5 full questions, selecting one full question from each module.
- Marks scored shall be proportionally reduced to 50 marks

Suggested Learning Resources:**Books**

1. Klein W., Vol. 4 & 5, "A Practical Guide to Ring Spinning" and "New Spinning Systems" The Textile Institute, Manchester, 1987.
2. Mahendra Gowda, "New Spinning Systems", NCUTE Publications, 2006.
3. **Weaving machines, mechanisms, Management.** M.K.Talukdar. Mahajan Pub. Ahmedabad

Reference(s) :

1. Lawrence C.A. and Chen K.Z, "Rotor Spinning", Textile Progress, Vol. 13, No.4, Textile Institute, U.K., 1981

<ol style="list-style-type: none"> 2. Carl A. Lawrence, "Fundamentals of Spun Yarn Technology", CRC Press, 2003. 3. Lord P.R., "Handbook of yarn production", Wood Head publishing, 2003. 4. Salhotra K.R, Alagirusamy, Chattopadhyay R, "Ring Spinning, Doubling and Twisting", NCUTE Publications 2000.
Web links and Video Lectures (e-Resources):
<ul style="list-style-type: none"> • NPTEL Courses on weaving preparatory.
Activity Based Learning (Suggested Activities in Class)/ Practical Based learning
<ul style="list-style-type: none"> • Demonstration of OE spinning machines settings of winding machines. • Demonstration and setting of pirn winding and warping machines. • Collecting various sizing ingredients nearby industries and study their suitability for different yarns. • Visiting nearby Textile industries to learn various aspects of weaving preparatory.

HIGH PERFORMANCE AND SPECIALITY FIBRES		Semester	V
Course Code	BTX515B	CIE Marks	50
Teaching Hours/Week (L: T:P: S)	3:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40-45	Total Marks	100
Credits	03	Exam Hours	03
Examination nature (SEE)	Theory		
Course objectives:			
To make the students to have knowledge in the field of high performance and high function fibres.			
Teaching-Learning Process (General Instructions):			
These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes:			
<ol style="list-style-type: none"> 1. Apart from conventional lecture methods, various types of innovative teaching techniques through videos, animation films may be adopted so that the delivered lesson can progress the students in theoretical, applied and practical skills. 2. Seminars and Quizzes may be arranged for students in respective subjects to develop skills. Encourage the students for group learning to improve their creativity and analytical skills. Support and guide the students for self-study. 			
Module-1			
Definition, classification and structural requirements of high performance and specialty fibers, Polymerization, spinning and properties of aramids, aromatic polyesters, rigid rod and ladder polymers such as PBZT, PBO, PBI, PIPD Brief description on liquid crystalline behavior of these polymers and fibers, types of LCPS, their anisotropic behaviour.			

Module-2
Manufacture of carbon fibres from polyacrylonitrile, viscose and pitch precursors, Concept of gel spinning and spinning of UHMWHDPE fibres, Elastomeric polymers and fibres, Lyocell fibre production, Conducting fibres, Thermally and chemically resistant polymers and fibres
Module-3
Methods of synthesis, production and properties of: glass and ceramic fibres. Specialty fibres: profile fibres, optical fibres, bicomponent fibres and hybrid fibres, Superabsorbent polymers and fibres.
Module-4
High touch fibres: silk like fibre, skin like fabric power fibres which store solar energy, chameleonic fabrics perfumed pantyhose Biomimetic chemistry and fibres: Application of morphology/structure. Hybridization technology.
Module-5
Biotechnology and fibres, electronics and fibres, cars and fibres, fibres in space, fibres and nuclear power, fibres in sports, fibres for geotextiles.
Course outcome (Course Skill Set) At the end of the course, the student will be able to : <ol style="list-style-type: none"> 1. Explain the production and properties of high-performance organic fibres. 2. Summarise the production of carbon, UHMWHDPE, elastomeric, lyocell optical bicomponent, hybrid and conducting fibres 3. Demonstrate the production of glass ceramic and speciality fibres 4. Illustrate High touch and biomimetic chemistry of fibres. 5. Identify the need of special fibres in biotechnology, electronics, cars space, nuclear power, sports and geotextiles. Assessment Details (both CIE and SEE) The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together. Continuous Internal Evaluation: <ul style="list-style-type: none"> • For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks. • The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered • Any two assignment methods mentioned in the 22OB2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned. • For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment.

Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (**duration 03 hours**).

- The question paper will have ten questions. Each question is set for 20 marks.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
- The students have to answer 5 full questions, selecting one full question from each module.
- Marks scored shall be proportionally reduced to 50 marks

Suggested Learning Resources:

Books

15. T. Hongu. Philips G.O. **New fibers** Ellis Fibers -1990
16. **High Performance fibres**, J.W.S.Hearle, Wood Head,UK-2005.
17. T. Hongu. Philips G.O. **New Millamium Fibres** .Wood Head,UK 2005
18. Gupta V.B. Kothari V.K. **Manufactured Fibre Technology**.Springer-1997

Web links and Video Lectures (e-Resources):

- NPTEL course on manufactured fibre technology and High Performance Fibres.

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- Samples of speciality and high-performance fibres may be demonstrated to students and practical utility of these fibres may be explained.
- Students may be taken to industries which make use of these fibres.

HUMAN RESOURCE MANAGEMENT IN TEXTILE INDUSTRY		Semester	V
Course Code	BTX515C	CIE Marks	50
Teaching Hours/Week (L: T:P: S)	3:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40-45	Total Marks	100
Credits	03	Exam Hours	03
Examination nature (SEE)	Theory		
Course objectives:			
<ul style="list-style-type: none"> • To understand the HRM concepts and theory. • To obtain an over view of various HRM functions and practices. • To gain an insight in to the various statutory provisions 			
Teaching-Learning Process (General Instructions)			
These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes:			
<ol style="list-style-type: none"> 1. State the importance of Human Resource through related videos 2. Seminars & Quizzes may be arranged in respective topics to develop skills 3. Inspire the students by giving examples of present day Human Resource Management in various Textile activities. 4. Support and guide the students for Self-study. 			
Module-1			

<p>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.</p>
<p>Module-2</p>
<p>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.</p>
<p>Module-3</p>
<p>Recruitment: Definition, Constraints and Challenges, Sources and Methods of Recruitment. Selection: Definition and Process of Selection. Placement, Induction.</p>
<p>Module-4</p>
<p>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.</p>
<p>Module-5</p>
<p>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 Out Sourcing (HR issues).</p>
<p>Course outcome (Course Skill Set) At the end of the course, the student will be able to :</p> <ol style="list-style-type: none"> 1. Summarize and measure the various importance of human resources and their effective management in organizations. 2. Discuss the various key aspects of forecasting the human resources needs of an organization 3. Analyze the role of recruitment and selection in relation to the organization's business and human resource management. 4. Adapt the organizational and individual benefits of training and development. Apply and discuss the appropriate practices involved in the grievance and discipline process
<p>Assessment Details (both CIE and SEE) The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.</p> <p>Continuous Internal Evaluation:</p> <ul style="list-style-type: none"> • For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks. • The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered

<ul style="list-style-type: none"> Any two assignment methods mentioned in the 220B2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned. For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment. <p>Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.</p> <p>Semester-End Examination:</p> <p>Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (duration 03 hours).</p> <ul style="list-style-type: none"> The question paper will have ten questions. Each question is set for 20 marks. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module. The students have to answer 5 full questions, selecting one full question from each module. Marks scored shall be proportionally reduced to 50 marks
<p>Suggested Learning Resources:</p> <p>Books</p> <ol style="list-style-type: none"> Human Resource Management and Industrial Relations - Dr. P. Subba Rao, Himalaya Publishing House, Mumbai, 2009 Personal Management – Edvin B. Flippe Human Resources Management – Rao V. S. P, Excel BOOKS - 2010 Personal Management – Subratha Ghosh Human Resource Management - Dr. T. P Renuka Murthy, HPH Management of Personnel in India - N. N Chatterjee
<p>Web links and Video Lectures (e-Resources):</p> <ul style="list-style-type: none"> https://youtu.be/C6q-ala_EkU
<p>Activity Based Learning (Suggested Activities in Class)/ Practical Based learning</p> <ul style="list-style-type: none"> Encourage the students to have group discussion taking case study of any textile industry

FINANCIAL MANAGEMENT		Semester	V
Course Code	BTX515D	CIE Marks	50
Teaching Hours/Week (L: T:P: S)	3 : 0 : 0 : 0	SEE Marks	50
Total Hours of Pedagogy	40-45	Total Marks	100
Credits	03	Exam Hours	03
Examination nature (SEE)	Theory		
Course objectives:			
<ol style="list-style-type: none"> To summarize the students with basic concepts of financial management. To understand time value of money and cost of capital. To analyze capital structure, capital budgeting and dividend decision. To understand the short term and long term financing and working capital management. 			
Teaching-Learning Process (General Instructions)			
These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes:			
<ol style="list-style-type: none"> These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes. State the importance of Subject through related videos Seminars & Quizzes may be arranged in respective topics to develop skills 			

<p>4. Inspire the students by giving present day Financial management in various Textile activities.</p> <p>5. Have the exposure to online trading (NSE & BSE)</p> <p>6. Support and guide the students for Self study</p>
Module-1
<p>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.</p>
Module-2
<p>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 pay back period, accounting rate of return.</p>
Module-3
<p>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.</p>
Module-4
<p>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,</p> <p>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.</p>
Module-5
<p>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 guide lines on the maintenance of cost records</p>
<p>Course outcome (Course Skill Set)</p> <p>At the end of the course, the student will be able to :</p> <ol style="list-style-type: none"> 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.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

- For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks.
- The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered
- Any two assignment methods mentioned in the 220B2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned.
- For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment.

Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (**duration 03 hours**).

- The question paper will have ten questions. Each question is set for 20 marks.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
- The students have to answer 5 full questions, selecting one full question from each module.
- Marks scored shall be proportionally reduced to 50 marks

Suggested Learning Resources:**Books**

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
4. Financial Management – V K Bhalla, S. Chand Publishing, 2014
5. Fundamentals of Financial Management – 12th Edition, Brigham & Houston, Cengage Learning, 2012
19. Financial Management: Principles and Applications- 10th Edition, Arthur J. Keown, John H. Martin, John W. Petty and David F. Scott, Prentice Hall, 2004

Web links and Video Lectures (e-Resources):

- <https://www.youtube.com/watch?v=vuC6fYPUuDU>
- https://www.youtube.com/watch?v=CCQwz_Gwo6o

TEXTILE MATHEMATICS-I		Semester	VI
Course Code	BTX601	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	3:0:2:0	SEE Marks	50
Total Hours of Pedagogy	40 hours Theory + 8-10 Lab slots	Total Marks	100
Credits	04	Exam Hours	03
Examination nature (SEE)	Theory		
Course objectives:			
This Course aims at updating knowledge of students in following fields of statistical quality control			
<ol style="list-style-type: none"> 1. Concepts of statistics and quality control. 2. Analyze the data, use suitable statistical tool to draw suitable conclusions. 3. Comparing different processes, parameters etc. for quality control. 			
Teaching-Learning Process (General Instructions)			
These are sample Strategies; that teachers can use to accelerate the attainment of the various course outcomes.			
<ol style="list-style-type: none"> 1. Apart from conventional lecture methods, various types of innovative teaching techniques through videos, animation films may be adopted so that the delivered lesson can progress the students in theoretical, applied and practical skills. 2. Seminars and Quizzes may be arranged for students in respective subjects to develop skills. 3. Encourage the students for group learning to improve their creativity and analytical skills. Support and guide the students for self-study. 			
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.			
MODULE-3			
Control charts, their uses and limitations in control of quality, concept of control limits, specification limits, \bar{X} R, 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 way. Correlation and Correlation co- efficient. Regression Analysis			

PRACTICAL COMPONENT OF IPCC

Sl.NO	Experiments
1	Collection and presentation of data by conducting an experiment in testing laboratory.
2	Presentation of data in pictorial form by conducting an experiment in testing laboratory.
3	Determination of measures of central tendency and dispersion after collecting two set of data (by experiment) and comparing consistency of the data.

4	Testing the data for normal distribution, and determining Skewness and Kurtosis values.
5	Determination of confidence interval of the given set of data in testing lab.
6	Conducting significance test of given set of data (t test).
7	Conducting test significance test for variance.
8	Determining faults in yarn and preparing suitable control chart.
9	Conducting variance analysis of given set of data taken from various tests.
10	Conducting a case study on determination of correlation coefficient and regression analysis.
11	For a given AQL for a roll of fabric accept/ reject the roll- a case study.
12	Using the published data forecasting the data for future.

Course outcomes (Course Skill Set):

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

1. Define and apply basic concepts of statistics, data collection presentation and measures of central tendency.
2. Make use of various statistical distribution and confidence interval.
3. Inspect quality, control quality and predict and analyse time series.
4. Analyse and choose significance of results and statistical hypothesis.
5. Conduct variance analysis, and compute correlation and regression.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

CIE for the theory component of the IPCC (maximum marks 50)

- IPCC means practical portion integrated with the theory of the course.
- CIE marks for the theory component are **25 marks** and that for the practical component is **25 marks**.
- 25 marks for the theory component are split into **15 marks** for two Internal Assessment Tests (Two Tests, each of 15 Marks with
- 01-hour duration, are to be conducted) and **10 marks** for other assessment methods mentioned in 22OB4.2. The first test at the end of 40-50% coverage of the syllabus and the second test after covering 85-90% of the syllabus.
- Scaled-down marks of the sum of two tests and other assessment methods will be CIE marks for the theory component of IPCC (that is for **25 marks**).
- The student has to secure 40% of 25 marks to qualify in the CIE of the theory component of IPCC.

CIE for the practical component of the IPCC

- **15 marks** for the conduction of the experiment and preparation of laboratory record, and **10 marks** for the test to be conducted after the completion of all the laboratory sessions.
- On completion of every experiment/program in the laboratory, the students shall be evaluated

including viva-voce and marks shall be awarded on the same day.

- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to **15 marks**.
- The laboratory test (**duration 02/03 hours**) after completion of all the experiments shall be conducted for 50 marks and scaled down to **10 marks**.
- Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IPCC for **25 marks**.
- The student has to secure 40% of 25 marks to qualify in the CIE of the practical component of the IPCC.

SEE for IPCC

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (**duration 03 hours**)

- The question paper will have ten questions. Each question is set for 20 marks.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
- The students have to answer 5 full questions, selecting one full question from each module.
- Marks scored by the student shall be proportionally scaled down to 50 Marks

The theory portion of the IPCC shall be for both CIE and SEE, whereas the practical portion will have a CIE component only. Questions mentioned in the SEE paper may include questions from the practical component.

Suggested Learning Resources:

Books:

1. **Textile Testing**, -J.E. Booth, CBS Publishers, New Delhi, 1996
2. **Handbook of Textile Testing and Quality control**- Hamby Grower, Wiley Eastern Pvt. Ltd. Delhi 1969.
3. **Practical Statistics for Textile Industry**-Part-1 & 2, Gave-Leaf, Textile Institute, 1984
4. **A Textbook of statistics**, Rajamohan 1995 **Statistics For Textile Technologists**- L.H. C.Tippet, Textile Institute, Manchester 1973

Web links and Video Lectures (e-Resources):

NPTEL course on Evaluation of textile materials-Module- 2

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning:

1. Collection of existing data on textile materials from literature and applying statistical tools for the same
2. Collecting data from textile testing lab of the department and applying statistical concepts
3. Collecting various data related to textiles from nearby industries (case study) and applying statistical tools
4. Seminars, quizzes, group discussions, seminars and report writing on various statistical concepts.

TEXTILE TESTING-I		Semester	VI
Course Code	BTX602	CIE Marks	50
Teaching Hours/Week (L: T:P: S)	3:2:0:0	SEE Marks	50
Total Hours of Pedagogy	50-55	Total Marks	100

Credits	04	Exam Hours	03
Examination nature (SEE)	Theory		
<p>Course objectives:</p> <p>The objective of this Course is to make students to</p> <ul style="list-style-type: none"> • Explain the importance of textile testing and quality control in textile industry. • Demonstrate and demonstrate different methods, standards, principles and working of instruments used for testing of fibres and yarns. • Evaluate various properties and characteristics of fibres and yarns, calculate and analyse the test results. Compare and draw suitable conclusions • Evaluate and analyse effects of various parameters affecting test results • Demonstrate various settings and calibration of testing equipment • Explain the use of modern technology in the measurement of properties of fibres and yarns. 			
<p>Teaching-Learning Process (General Instructions)</p> <p>These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.</p> <ol style="list-style-type: none"> 1. Apart from conventional lecture methods various types of innovative teaching techniques through videos, working models, animation films may be adopted so that the delivered lesson can progress the students in theoretical, applied and practical skills. 2. Hands on training may be arranged for students to learn practical aspects. 3. Encourage the students to learn machinery operations various settings and maintenance. 4. Support and guide the students for self-study. 			
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 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 outcome (Course Skill Set)

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

- Explain the importance and necessity of determination of properties and characteristics of textile fibres and yarns
- Use of suitable equipment for the measurement of properties of fibres and yarns using appropriate method, standard and techniques
- Demonstrate the principle and working of testing instruments
- Explain the test parameters and their effects on quality parameters of textile materials
- Analyse the causes for poor quality of fibres and yarns and their effects on quality of end products.

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

- For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks.
- The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered
- Any two assignment methods mentioned in the 22OB2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned.
- For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment.

Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (**duration 03 hours**).

- The question paper will have ten questions. Each question is set for 20 marks.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
- The students have to answer 5 full questions, selecting one full question from each module.
- Marks scored shall be proportionally reduced to 50 marks

Suggested Learning Resources:**Books**

1. Physical testing of textiles B.P. Senville 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

<ol style="list-style-type: none"> 1. B.I.S. Handbook BIS BIS publications 2000 2. B.S. Handbook G. Weston BS publications 2009 3. Textile Testing James Lomak, Longmans Green and Co. London 2002 4. ASTM standard ASTM USA ASTM publication 1985 5. Cotton assessment and appreciation SITRA Norms and Procedures SITRA, Coimbatore 1017
Web links and Video Lectures (e-Resources):
<ul style="list-style-type: none"> • NPTEL lecture series • YouTube simulation videos
Activity Based Learning (Suggested Activities in Class)/ Practical Based learning
Practical classes. Seminars in group.

TECHNICAL TEXTILES		Semester	VI
Course Code	BTX613A	CIE Marks	50
Teaching Hours/Week (L: T:P: S)	3:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40-45	Total Marks	100
Credits	03	Exam Hours	03
Examination nature (SEE)	Theory		
Course objectives:			
The objective of this Course is to make students understand:			
<ol style="list-style-type: none"> 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 			
Teaching-Learning Process (General Instructions)			
These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.			
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			

<p>TEXTILES IN FILTRATION: 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.</p>
<p>Module-4</p>
<p>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.</p>
<p>Module-5</p>
<p>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.</p>
<p>Assessment Details (both CIE and SEE)</p> <p>The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.</p> <p>Continuous Internal Evaluation:</p> <ul style="list-style-type: none"> • For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks. • The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered • Any two assignment methods mentioned in the 22OB2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned. • For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment. <p>Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.</p> <p>Semester-End Examination:</p> <p>Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (duration 03 hours).</p> <ul style="list-style-type: none"> • The question paper will have ten questions. Each question is set for 20 marks. • There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module. • The students have to answer 5 full questions, selecting one full question from each module. • Marks scored shall be proportionally reduced to 50 marks
<p>Suggested Learning Resources:</p> <p>Books</p> <p>20. Hand book of Technical Textiles -A. R. Horrocks, S.C. Anand Wood Head Pub., England 2000</p> <p>21. Hand book of Industrial Textiles -S. Adanur Lancaster-Basel 1995</p> <p>22. Smart Fibres - Fabrics & Clothing -Xiaoming Tao Wood Head Pub., England 2001</p> <p>23. Design of Textiles For Industrial -P.W. Harrison Textile Institute, Manchester 1977</p>

<p>Reference Books</p> <ol style="list-style-type: none"> 1. Hand book of Industrial Textiles -R. Kaswell Willington, New York 1963 2. Industrial Textiles -P.K.Badami 3. International Seminar on Technical Textiles -SASMIRA SASMIRA 2000
<p>Web links and Video Lectures (e-Resources):</p> <p>NPTEL course on technical textiles</p>
<p>Activity Based Learning (Suggested Activities in Class)/ Practical Based learning</p> <p>Visit to technical textile industries, group seminars, survey projects etc.</p>

TQM IN TEXTILE INDUSTRY		Semester	VI
Course Code	BTX613B	CIE Marks	50
Teaching Hours/Week (L:T:P:S)	3:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40-45	Total Marks	100
Credits	03	Exam Hours	03
Examination nature (SEE)	Theory		
<p>Course objectives:</p> <ol style="list-style-type: none"> 1. To make the students to understand and acquire the concepts of Total Quality Management tools 2. It helps the Students to apply the 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. 			
<p>Teaching-Learning Process (General Instructions)</p> <p>These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes:</p> <ol style="list-style-type: none"> 1. Apart from conventional lecturer methods various types of innovative teaching techniques through videos, may be adopted so that the delivered lesson can progress the students in theoretical and applied analysing skills. 2. Seminars may be arranged for students to develop these subject skills. 3. To encourage the students for group learning to improve their creativity and communicationskills. 4. To support and guide the students for self-study. 5. Encourage students to visit and observe working of TQM concepts in various Textile and Garment Industries. 			
Module-1			
<p>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, ISO9000 & ISO 14000 in quality management system.</p>			
Module-2			
<p>QUALITY & MANAGEMENT PHILOSOPHIES</p> <p>Deming Philosophy: Chain reaction, 14 points for management, triangle theory of variance, deadly diseases & sins, Deming's wheel.</p> <p>Juran's Philosophy: 10 steps for quality improvement, quality trilogy, universal breakthroughsequence.</p>			

<p>Crosby Philosophy: Crosby's 6 C's, Absolutes of quality, Crosby's 14 points for quality, Crosby triangle. Comparison of 3 major quality philosophies</p>
<p>Module-3</p>
<p>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.</p>
<p>Module-4</p>
<p>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.</p>
<p>Module-5</p>
<p>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.</p>
<p>Course outcome (Course Skill Set) At the end of the course, the student will be able to :</p> <ol style="list-style-type: none"> 1. Define and explain about basic concepts TQM. 2. Explain about Quality and management Philosophy. 3. Classify and discuss about managing quality and quality control 4 Summarize and discuss the role of TQM in leadership and tools and techniques of TQM. 5. Illustrate and discuss about Supply chain management. <p>Assessment Details (both CIE and SEE) The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.</p>

<p>Continuous Internal Evaluation:</p> <ul style="list-style-type: none"> • For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks. • The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered • Any two assignment methods mentioned in the 22OB2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned. • For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment. <p>Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.</p> <p>Semester-End Examination:</p> <p>Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (duration 03 hours).</p> <ul style="list-style-type: none"> • The question paper will have ten questions. Each question is set for 20 marks. • There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module. • The students have to answer 5 full questions, selecting one full question from each module. • Marks scored shall be proportionally reduced to 50 marks 		
<p>Suggested Learning Resources:</p> <p>Books</p> <p>Text Books</p> <ol style="list-style-type: none"> 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 <p>Reference Books</p> <ol style="list-style-type: none"> 1. Norms For Spinning, Weaving and Processing, ATIRA Publication, Ahmadabad, 1990 <p>Handbooks manuals, BIS, ASTM, ISO-9000</p>		
<p>Web links and Video Lectures (e-Resources):</p>		
<p>Web links and Video Lectures (e-Resources):</p> <ul style="list-style-type: none"> • https://asq.org/quality-resources/total-quality-management • www.investopedia.com/terms/t/total-quality-management-tqm.asp • https://www.youtube.com/watch?v=oMYqqAbsEXo • https://www.youtube.com/watch?v=SMOQV2CyVQo • https://www.youtube.com/watch?v=SMOQV2CyVQo&list=RDCMUC640y4UvDAlya_WOj5U4pfA&start_radio=1&rv=SMOQV2CyVQo&t=28 • https://www.youtube.com/watch?v=ksR4Xy6tFcM • https://www.youtube.com/watch?v=YKwcxjUnots • https://www.youtube.com/watch?v=DJPXQ7OU7qo 		
<p>Activity Based Learning (Suggested Activities in Class)/ Practical Based learning</p> <p>Activity Based Learning (Suggested Activities in Class)/ Practical Based learning</p> <ul style="list-style-type: none"> • https://www.isixsigma.com/methodology/total-quality-management-tqm/applying-total-quality-management-academics/ • https://www.slideshare.net/justinsolin/total-quality-management-56112246 		

APPAREL QUALITY ASSURANCE	Semester	VI
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Course Code	BTX613C	CIE Marks	50
Teaching Hours/Week (L: T:P: S)	3:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40-45	Total Marks	100
Credits	03	Exam Hours	03
Examination nature (SEE)	Theory		
Course objectives:			
<ul style="list-style-type: none"> • To impart skills for analysis of garment specification sheets and to translate them into quality output. • To familiarize students with advanced apparel quality tests and standards. • To make students to understand the importance of quality assurance in the manufacture of apparels in apparel industry. • To enable the students to understand the production planning in garment industry. • To emphasis on the improved methods of material control in apparel production • To acquaint student with quality concepts for implementing quality in apparel production 			
Teaching-Learning Process (General Instructions)			
<p>These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes:</p> <ol style="list-style-type: none"> 1. Apart from conventional lecture methods, various types of innovative teaching techniques through videos, animation films may be adopted so that the delivered lesson can progress the students in theoretical, applied and practical skills. 2. Seminars and Quizzes may be arranged for students in respective subjects to develop skills. 3. Encourage the students for group learning to improve their creativity and analytical skills. 4. Support and guide the students for self-study. 5. Encourage students to observe working of various apparel manufacturing machineries to understand quality aspects. 6. Actual production of apparels can be demonstrated to students by taking them to apparel industries. 7. Encourage students to observe quality control tools used in the apparel manufacturing industries. 			
Module-1			
Introduction to quality control: Definition of quality, importance of quality assurance, evaluation of quality, quality planning, quality control, total quality management, IPQC, AQL, IMIL standard and final inspection.			
Module-2			
Quality management systems- organising, planning and implementation. Importance of quality assurance in textile and apparel industries, various tools used for quality assurance. Tools for quality assurance			
Module-3			
Care labelling: Introduction, labelling parameters, fibre content, wash care labels. Labelling systems- Canadian, American, European, Australian, Sweden, UK, Germany, Japan and Indian. Regulations for labelling parameters. Eco-labelling.			
Module-4			
Accessories testing, inspecting garments using spec sheets, inspecting garments using measuring tapes/without using measuring tapes, Button quality testing, interlining quality testing, packing a shirt and identifying faults.			

Module-5
<p>Applying quality assurance programmes in fabric department, cutting department, sewing production department and finishing department. Garment quality tests for dimensions, fabric constructions, weight, stitch lines, seams, special stitches, and finishes.</p>
<p>Course outcome (Course Skill Set) At the end of the course, the student will be able to :</p> <ol style="list-style-type: none"> 1. Method and principle involved in inspection/testing of fabric, zippers, buttons, sewing threads etc. 2. Understand the quality parameters of textile materials. 3. Understand Production planning in apparel industry 4. Accessories testing and quality control in apparel industry 5. Summarize the applications of quality assurance in apparel industries.
<p>Assessment Details (both CIE and SEE) The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.</p> <p>Continuous Internal Evaluation:</p> <ul style="list-style-type: none"> • For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks. • The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered • Any two assignment methods mentioned in the 220B2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned. • For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment. <p>Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.</p> <p>Semester-End Examination: Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (duration 03 hours).</p> <ul style="list-style-type: none"> • The question paper will have ten questions. Each question is set for 20 marks. • There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module. • The students have to answer 5 full questions, selecting one full question from each module. • Marks scored shall be proportionally reduced to 50 marks
<p>Suggested Learning Resources:</p> <p>Books</p> <ol style="list-style-type: none"> 1. Pradip V Mehta, Quality Control in Apparel Industry, NIFT Publication, New Delhi, 2001. 2. Sara J Kadolph, Quality Assurance for Textiles and Apparels, Fairchild Publications, 2nd Edition, 2007. 3. Harold Care & Barbar Latham, The Technology of Clothing Manufacture, Oxford Publication, USA, 1994.

4. Ruth E C, Apparel Manufacturing and Sewn Product Analysis.
5. Pradip V Mehta, Introduction to Quality Control, ASCQ quality Press, Marcel Dekker Inc., New York, 1992.

Reference books:

1. Garry Cooklin, Introduction to Clothing Manufacture, Blackwell Science, UK, 1991.
2. Chulter A J, Introduction to Clothing Production Management, Blackwell Science, UK, 1998.
3. "Apparel Production Handbook", Jacob Solinger., Reinhold Publications, 1998,
4. "Introduction to Clothing Production Management", Chuter A.J., Blackwell Scientific Publications, Oxford, 2001

Web links and Video Lectures (e-Resources):

- NPTEL course on quality assurance: <https://nptel.ac.in/courses/>
- NPTEL course on total quality management: <https://nptel.ac.in/courses/>
- NPTEL course on quality control: <https://nptel.ac.in/courses/>
- Apparel quality control & quality assurance: <https://www.slideshare.net/SAMultimedia/apparel-quality-control-quality-assurance>
- Apparel quality assurance: <https://textilelearner.net/?s=Apparel+quality+assurance>

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- Collection of apparel quality assurance data from literature and studying their quality assurance concepts.
- Seminars, quizzes, group discussions, seminars and report writing on various apparel quality assurance concepts.
- Observing machineries in apparel manufacturing industries and calculating various apparel quality assurance parameters.
- Practical exposure to various apparel quality parameters and demonstration.

INDUSTRIAL ENGINEERING IN TEXTILE AND APPAREL INDUSTRY		Semester	VI
Course Code	BTX613D	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	3:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
Examination nature (SEE)	Theory		

Course objectives:

- 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.

Teaching-Learning Process (General Instructions)

These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes:

1. State the importance of Industrial engineering through related videos
2. Seminars & Quizzes may be arranged in respective topics to develop skills
3. Arrange Industrial visits to understand practically the duties of Industrial engineer.

4. Support and guide the students for Self study.
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 outcome (Course Skill Set) At the end of the course, the student will be able to : 1: Explain the importance of Industrial engineers and industrial engineering department in Textile and Garment Industry. 2: Demonstrate Plant location and Plant layout 3: Explain Work study and its importance & Method study and its objects 4: Explain Method study and its objects & Study of different types of allowances 5: Explain the Production planning and Control (PPC).

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

- For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks.
- The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered
- Any two assignment methods mentioned in the 220B2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned.
- For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment.

Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (**duration 03 hours**).

- The question paper will have ten questions. Each question is set for 20 marks.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
- The students have to answer 5 full questions, selecting one full question from each module.
- Marks scored shall be proportionally reduced to 50 marks

Suggested Learning Resources:**Books**

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

1. Production and operations management Thomas E Morton Vikas Publishing House, First Indian reprint 2003
2. Computer Aided Production Management Mahapatra P B Prentice Hall of India 2001
3. Production Management Martand T Telsang S Chand and Company 2003

Technology of Fibre to Fabric		Semester	VI
Course Code	BTX654A	CIE Marks	50
Teaching Hours/Week (L: T:P: S)	3:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40-45	Total Marks	100
Credits	03	Exam Hours	03
Examination nature (SEE)	Theory		
<p>Course objectives</p> <ul style="list-style-type: none"> • Complete knowledge of textiles will facilitate the ability to distinguish quality in fabrics. • Students will know how to buy textile product and what to buy. • Information can be easily understood and consequently very useful to the students in business and personal life. 			
<p>Teaching-Learning Process (General Instructions)</p> <p>These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.</p> <ol style="list-style-type: none"> 1. Use the related videos of Textile machineries so that student can understand more easily. 2. Show students the different samples of the fabric and ask them to identify the fibres. 3. Inspire the students to have collaborative learning in the class. 4. Support and guide the students for Self-study. 			
Module-1			
FIBRES TO YARNS: Introduction to Fibres. Yarn Formation: Brief introduction of all spinning process including Open end spinning.(No passage of material & calculation).Introduction to count system and calculations .Textured & stretch yarns: comfort, service & appearance.			
Module-2			
YARNS TO FABRICS: Introduction to weaving with the mechanisms. Brief study about weaves such as Plain, Twill, satin, etc. Different types of selvedge. Introduction to Knitting & Non-woven fabric formation.			
Module-3			
Fabric preparation for consumer goods: Finishing processes like preparatory, stabilizing & texturizing with their functional effects .Dyeing and Printing.			
Module-4			
Introduction to Natural fibres: Cotton, Linen, Wool & Hair, Silk, Vegetable and mineral fibres.			
Module-5			
Introduction to Manmade Fibres: Rayon , Acetate & Triacetate , Nylon , Aramid , Polyester, Acrylic, Modacrylic , Spandex, Polypropylene.			
<p>Course outcome (Course Skill Set)</p> <p>At the end of the course, the student will be able to :</p> <p>At the end of the course, the student will be able to :</p> <ol style="list-style-type: none"> 1. Method and principle involved in fibre to yarn formation and method of yarn count calculations. 2. Understand the method of fabric formations and machineries used for fabric formations. 3. Understand fabric dyeing and printing, finishing of fabrics in industry 4. Types of natural fibres and their end uses 5. Types of manmade fibres and their end uses. 			

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

- For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks.
- The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered
- Any two assignment methods mentioned in the 220B2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned.
- For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment.

Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (**duration 03 hours**).

- The question paper will have ten questions. Each question is set for 20 marks.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
- The students have to answer 5 full questions, selecting one full question from each module.
- Marks scored shall be proportionally reduced to 50 marks

Suggested Learning Resources:

- Books.** TEXTILES ,Fiber to Fabric ,Bernard P Corbman, MC.GRAW-HILL publication
2. Manual of Cotton Spinning Coulson. A.F.W.(Ed.),Vol. I to IV Textile Institute, Manchester,1958
 3. Series on Textile processing Zaloski.S ,The Institute of Textile Technology, USA1983
 4. Technology of short-staple spinning, Klein. W. Vol .I, II, III and IV, Textile Institute Pub.,Manchester,1989.

Web links and Video Lectures (e-Resources):

- <https://youtu.be/7h4MvoZt60E>

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- Ask the students to collect different fibres, yarns and fabrics having different weaves. Obtain different samples of fabrics used in cotton clothing. Attach to each a record showing the name of the fabric, kinds of yarns, weave, thread count, and finish .State the uses and relative durability of each sample.

POLYMER AND FIBRE SCIENCE		Semester	VI
Course Code	BTX654B	CIE Marks	50
Teaching Hours/Week (L:T:P:S)	3:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40-45	Total Marks	100
Credits	03	Exam Hours	03
Examination nature (SEE)	Theory		
Course objectives:			
This course aims at making engineering students to have knowledge in the fields of polymer and fibres which have wide variety of applications in various fields.			
Teaching-Learning Process (General Instructions)			
These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.			
Apart from conventional lecture methods, various types of innovative teaching techniques through videos, animation films may be adopted so that the delivered lesson can progress the students in theoretical, applied and practical skills. Seminars and Quizzes may be arranged for students in respective subjects to develop skills. Encourage the students for group learning to improve their creativity and analytical skills. Support and guide the students for self-study.			
Module-1			
Introduction to polymers. Historical back ground, nomenclature, classification of polymers. Different methods of production of polymers, general applications of polymers.			
Module-2			
Kinetics of addition polymerization, Carothers equation, polymerization techniques Characterization of polymers for molecular weight, importance of molecular weight of polymers. Copolymerization. Different techniques of processing of polymers.			
Module-3			
Introduction to textile fibres, requirement of polymers for converting in to fibres, primary and secondary properties of fibres. Brief details on production and properties and applications of cotton, silk, wool, bast, banana and coir fibres.			
Module-4			
Introduction to manufactured fibres, comparison of manufactured fibres with natural fibres. Outline of various methods of production of manufactured fibres. Production and properties of regenerated cellulosic fibres.			
Module-5			
Need for production of synthetic fibres, environmental concern related synthetic fibres, Brief outline on production, Properties and applications of PET, Nylon-6, Nylon-66, PP and acrylic fibres, Introduction to high-performance and speciality fibres.			
Course outcome (Course Skill Set)			
At the end of the course, the student will be able to :			

<ol style="list-style-type: none"> 1. Recognise the need for polymers, classify the polymers and explain methods of production of polymers 2. Describe kinetics of polymerization, molecular weight determination, techniques of polymerization and copolymerization. 3. Identify the need for textile fibres, classify the textile fibres and explain cotton, wool, silk, bast and coir fibres. 4. Compare natural and manufactured fibres, explain the methods of production of manufactured fibres and regenerated fibres. 5. Summarize the production, Properties and applications of PET, Nylon-6, Nylon-66, PP and acrylic fibres
<p>Assessment Details (both CIE and SEE)</p> <p>The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.</p> <p>Continuous Internal Evaluation:</p> <ul style="list-style-type: none"> • For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks. • The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered • Any two assignment methods mentioned in the 22OB2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned. • For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment. <p>Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.</p> <p>Semester-End Examination:</p> <p>Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (duration 03 hours).</p> <ul style="list-style-type: none"> • The question paper will have ten questions. Each question is set for 20 marks. • There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module. • The students have to answer 5 full questions, selecting one full question from each module. • Marks scored shall be proportionally reduced to 50 marks
<p>Suggested Learning Resources:</p> <p>Books</p> <ol style="list-style-type: none"> 1. Text book of polymer Science, Billmeyer.W., Wiley Int.Sc. New York 1984. 2. Polymer Science, Gowarikar V.R., Vishwanathan N.V., Jayadev Sridhara, Wiley EasternLtd., New Delhi, 3. Book of Textile fibre, Cook J. Vol.1 & II, Marrow Wat Ford, England. 4. Textile fibres, Shenai V.A., Sevak Bombay, 1980. 5. Manufactured fibre technology, Gupta V.B, Kothari V.K., Chapman Hall, London1997.
<p>Web links and Video Lectures (e-Resources):</p> <ul style="list-style-type: none"> • NPTEL courses on polymer science and textile fibres and manufactured fibre technology

<p>Activity Based Learning (Suggested Activities in Class)/ Practical Based learning</p> <ul style="list-style-type: none"> • Few practical classes may be conducted by demonstrating polymer production, fibre production. • Students may be taken to nearby textile industries to demonstrate processing of textile fibres.
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APPLICATION OF NANO TECHNOLOGY IN TEXTILES		Semester	VI
Course Code	BTX654C	CIE Marks	50
Teaching Hours/Week (L: T:P: S)	3:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40-45	Total Marks	100
Credits	03	Exam Hours	03
Examination nature (SEE)	Theory		
Course objectives:			
<ul style="list-style-type: none"> • To teach the concept of Nano technology and its application in textiles. • To educate the production of nano fibres by different process. • To impart knowledge on Nano composites and their properties. 			
Teaching-Learning Process (General Instructions)			
<p>These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.</p> <ol style="list-style-type: none"> 1. State the importance of Nano technology through related videos. 2. Seminars & Quizzes may be arranged in respective topics to develop skills. 3. Inspire the students by giving examples of nano textiles applications in various fields. 4. Support and guide the students for Self-study. 			
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 nano tubes 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 hydrophobic materials.			

Course outcome (Course Skill Set)

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

1. Describe the basics of Nano fibres
2. Introduces to production process of Nano composites and their properties
3. Discusses about Polymer layered silicate nano composites: structure and properties and their Dyeing methods
4. Describe the Surface modification techniques using Nano coating
5. Introduces to Hybrid Polymer Nano layers and Synthesis of hydrophobic material

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

Continuous Internal Evaluation:

- For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks.
- The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered
- Any two assignment methods mentioned in the 22OB2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned.
- For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment.

Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester-End Examination:

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (**duration 03 hours**).

- The question paper will have ten questions. Each question is set for 20 marks.
- There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
- The students have to answer 5 full questions, selecting one full question from each module.
- Marks scored shall be proportionally reduced to 50 marks

Suggested Learning Resources:**Books**

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

Web links and Video Lectures (e-Resources):

- NPTEL course on Nano technology

Activity Based Learning (Suggested Activities in Class)/ Practical Based learning

- Group seminars.

FASHION DESIGNING		Semester	VI
Course Code	BTX654D	CIE Marks	50
Teaching Hours/Week (L: T:P: S)	3:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40-45	Total Marks	100
Credits	03	Exam Hours	03
Examination nature (SEE)	Theory		
Course objectives: Students will have knowledge about fashion designing.			
Teaching-Learning Process (General Instructions) These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes			
<ol style="list-style-type: none"> 1. Seminars & Quizzes may be arranged in respective topics to develop skills. 2. Inspire the students by giving details of different fashion designing concepts. 3. Support and guide the students for Self-study. 			
Module-1			
Fashion: Introduction to fashion and apparel design. Origin of fashion, concept, analysis, trends and creations.			
Fashion Theories: Fashion of different eras, French and Greek revolutions, fashion promotion, style-fad-trends.			
Module-2			
Fashion Design fundamentals: Basic concept of design, elements of art, Definition of line shape, form, size, space, texture and colour. Structural and decorative dress designing, creating varieties through designs.			
Module-3			
Principles of Design: Definition Harmony, Proportion, Balance, Rhythm, Emphasis, meaning types and application on apparel psychology of clothing.			
Anatomy for designers: Human Proportion and figure construction. Methods of determining individual proportions.			
Module-4			
Psychology of Clothes: First impression, role of socio- psychological and economical aspects.			
Display of fashion materials: definition and importance, source technique and window display, classic fashion shows. Important fashion centers of the world and India.			
Module-5			
Computer aided designing: Fashion sketching, colour matching and computer graphics.			
Folios: Creative, Dress, designer.			
Course outcome (Course Skill Set)			
At the end of the course, the student will be able to :			

<ol style="list-style-type: none"> 1. Garment is designed by emphasizing the fashion and the fashion and consumer psychology viz. Fashion theories. 2. Study of fashion of different eras. 3. Study of French and greek revolutions. 4. Study of fashion promotion, style-fad-trends. 5. Study of fashion design fundamentals.
<p>Assessment Details (both CIE and SEE)</p> <p>The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.</p> <p>Continuous Internal Evaluation:</p> <ul style="list-style-type: none"> • For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks. • The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered • Any two assignment methods mentioned in the 220B2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned. • For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment. <p>Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.</p> <p>Semester-End Examination:</p> <p>Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the course (duration 03 hours).</p> <ol style="list-style-type: none"> 1. The question paper will have ten questions. Each question is set for 20 marks. 2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), should have a mix of topics under that module. 3. The students have to answer 5 full questions, selecting one full question from each module. 4. Marks scored shall be proportionally reduced to 50 marks

TEXTILE TESTING LAB-I		Semester	VI
Course Code	BTXL606	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	0:0:0:2	SEE Marks	50
Credits	01	Exam Hours	03
Examination nature (SEE)	Practical		
<p>Course objectives:</p> <p>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 test results and draw conclusions.</p>			
Sl.NO	Experiments		
1	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 moisture content and regain of textile materials.
7	Determination of yarn count.
8	Determination of single and ply yarn twist.
Demonstration Experiments (For CIE)	
9	Determination of fibre strength using Stelometer.
10	Determination of lea strength and CSP.
11	Determination of single yarn strength, elongation and RKM calculations.
12	Determination of tensile strength of sewing threads.
<p>Course outcomes (Course Skill Set): At the end of the course the student will be able to:</p> <ol style="list-style-type: none"> 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 <p>Assessment Details (both CIE and SEE) The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together</p> <p>Continuous Internal Evaluation (CIE): CIE marks for the practical course are 50 Marks. The split-up of CIE marks for record/ journal and test are in the ratio 60:40.</p> <ul style="list-style-type: none"> • Each experiment is to be evaluated for conduction with an observation sheet and record write-up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments are designed by the faculty who is handling the laboratory session and are made known to students at the beginning of the practical session. Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10 marks 	

- Total marks scored by the students are scaled down to **30 marks** (60% of maximum marks).
- Weightage to be given for neatness and submission of record/write-up on time.
- Department shall conduct a test of 100 marks after the completion of all the experiments listed in the syllabus.
- In a test, test write-up, conduction of experiment, acceptable result, and procedural knowledge will carry a weightage of 60% and the rest 40% for viva-voce.
- The suitable rubrics can be designed to evaluate each student's performance and learning ability.
- The marks scored shall be scaled down to **20 marks** (40% of the maximum marks).

The Sum of scaled-down marks scored in the report write-up/journal and marks of a test is the total CIE marks scored by the student.

Semester End Evaluation (SEE):

- SEE marks for the practical course are 50 Marks.
- SEE shall be conducted jointly by the two examiners of the same institute, examiners are appointed by the Head of the Institute.
- The examination schedule and names of examiners are informed to the university before the conduction of the examination. These practical examinations are to be conducted between the schedule mentioned in the academic calendar of the University.
- All laboratory experiments are to be included for practical examination.
- (Rubrics) Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered to by the examiners. **OR** based on the course requirement evaluation rubrics shall be decided jointly by examiners.
- Students can pick one question (experiment) from the questions lot prepared by the examiners jointly.
- Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners.

General rubrics suggested for SEE are mentioned here, writeup-20%, Conduction procedure and result in -60%, Viva-voce 20% of maximum marks. SEE for practical shall be evaluated for 100 marks and scored marks shall be scaled down to 50 marks (however, based on course type, rubrics shall be decided by the examiners)

Change of experiment is allowed only once and 15% of Marks allotted to the procedure part are to be made zero.

The minimum duration of SEE is 02 hours

PATTERN ENGINEERING AND DRAPING OF GARMENTS		Semester	VI
Course Code	BTX657A	CIE Marks	50
Teaching Hours/Week (L: T:P: S)	0:0:1:0	SEE Marks	50
Total Hours of Pedagogy	15	Total Marks	100
Credits	01	Exam Hours	02
Examination type (SEE)	Theory(GENERAL QUESTION PAPER TYPE)		

Course objectives:

- To provide opportunity for skill development in development of patterns for garment construction.
- To impart knowledge on fashion accessories and creativity.

<p>Teaching-Learning Process (General Instructions)</p> <p>These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.</p> <ol style="list-style-type: none"> 1. Conduct seminars and group activities related to the course. 2. Motivate students to take up self-study. 3. Motivate students to take part in various fashion designing activities conducted in the state.
Module-1
<p>Patterns – definition and types- individual and commercial patterns. Pattern making – definition and types of patterns making- drafting, draping, flat pattern techniques, their advantages and Disadvantages. Tools for pattern making. Body measurements – importance, principles, Precautions. Definition and standardization of size chart (ASTM Standards)</p>
Module-2
<p>Basic principles and methodologies used to draft standard basic block patterns for men, women and kids wear- top, skirt and bifurcated garment (pyjama). Pattern details –pattern name, cut number, on fold details, drill hole marks, darts, Seam allowances, notches, Balances marks and grain lines.</p>
Module-3
<p>Draping - Tools for Draping. Draping skills – preparation of basic blocks- bodice, skirt, sleeve and trouser</p>
Module-4
<p>Dart Manipulation – basic techniques – pivot method, slash and spread, measurement method. Applications of dart manipulation on bodice with darts on shoulder, armhole, side seam and Waistline.</p>
Module-5
<p>Grading – Definition, Principles and types –manual grading and computerized grading for bodice block, sleeve and skirt.</p>
<p>Course outcome (Course Skill Set)</p> <p>At the end of the course the student will be able to:</p> <ul style="list-style-type: none"> • Define and classify the patterns and memorize the steps involved in taking body measurement • Prepare the basic block patterns for men, women and kids wear based on the principles and methodologies of drafting • Prepare patterns for basic blocks using draping techniques <p>Assessment Details (both CIE and SEE)</p> <p>The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.</p> <p>Continuous internal Examination (CIE)</p> <ul style="list-style-type: none"> • For the Assignment component of the CIE, there are 25 marks and for the Internal Assessment Test component, there are 25 marks.

- The first test will be administered after 40-50% of the syllabus has been covered, and the second test will be administered after 85-90% of the syllabus has been covered
- Any two assignment methods mentioned in the 22OB2.4, if an assignment is project-based then only one assignment for the course shall be planned. The teacher should not conduct two assignments at the end of the semester if two assignments are planned.
- For the course, CIE marks will be based on a scaled-down sum of two tests and other methods of assessment.

Internal Assessment Test question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.

Semester End Examinations (SEE)

- The question paper will have ten questions. Each question is set for 10 marks.
- There will be 2 questions from each module. Each of the two questions under a module may or may not have the sub-questions (with maximum sub-questions of 02, with marks distributions 5+5, 4+6, 3+7).
- The students have to answer 5 full questions, selecting one full question from each module.

Suggested Learning Resources:

Books

- Helen Joseph Armstrong, "Pattern Making for Fashion Design" Pearson Education (Singapore) Pvt. Ltd., 2005
- Winifred Aldrich, "Metric Pattern Cutting" Blackwell Science Ltd., 1994
- Amaden-Crawford Connie, "The Art of Fashion Draping (3rd edition)" Om Books International Publications, 2005
- Hollen Norma R; Kundel Carlyn, "Pattern making by the flat pattern method", 1998
- Gillian Holman, "Pattern Cutting Made Easy", Blackwell Scientific Publications, 1997.
- Natalie Bray "More Dress Pattern Designing" Blackwell Scientific Publications, 1986.
- Gerry Cooklin, "Master Patterns and Grading for Women's Outsizes", Blackwell Scientific Publications, 1995.
- Gerry Cooklin, "Master Patterns and Grading for Men's Outsize", Blackwell Scientific Publications, 1992.
- Jeenne Price and Bernard Zamkoff, "Grading Techniques for Modern Design" Fairchild Publications, 1990.
- Helen J. Armstrong, —Pattern Making for fashion design|| Prentice Hal (2000)
- Winifred Aldrich, —Metric Pattern Cutting||, Black Well Science, UK

FASHION ACCESSORIES- LAB		Semester	VI
Course Code	BTXL657B	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	0:0:2:0	SEE Marks	50
Credits	01	Exam Hours	03
Examination nature (SEE)	Practical		
Course objectives:			
<ul style="list-style-type: none"> • To make the students to learn about fashion accessories 			
Sl.NO	Experiments		
1	Sketching and rendering of headgear like headband, hat, headscarves, skull caps, etc., (3 each). Construction of any two designs.		
2	Sketching and rendering of handbags for women and girls (theme based).		

3	Sketching and rendering of footwear (theme based).
4	Sketching and rendering of ties and bows for men and women (theme based).
5	Sketching and rendering of belts (theme based).
6	Sketching and rendering of different types scarves (theme based).
7	Sketching of accessories on sunglasses and hair accessories
8	Sketching of Indian jewellery – Traditional Indian jewellery.
9	Sketching of Indian jewellery – Modern Indian jewellery.
10	Sketching of Indian jewellery - Fashion jewellery.
	Demonstration Experiments (For CIE)
11	A market survey and report on fashion trends and development of accessories folio.
12	Creation of accessories (theme based) - Earring, hand wear, neck wear, finger wear, anklet and waist wear (one full set).
<p>Course outcomes (Course Skill Set): At the end of the course the student will be able to:</p> <ol style="list-style-type: none"> 1. Sketch the fashion accessories 2. Create fashion accessories 3. survey and prepare report on fashion trends. <p>Assessment Details (both CIE and SEE) The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together</p> <p>Continuous Internal Evaluation (CIE): CIE marks for the practical course are 50 Marks. The split-up of CIE marks for record/ journal and test are in the ratio 60:40.</p>	

- Each experiment is to be evaluated for conduction with an observation sheet and record write-up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments are designed by the faculty who is handling the laboratory session and are made known to students at the beginning of the practical session.
- Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10 marks.
- Total marks scored by the students are scaled down to **30 marks** (60% of maximum marks).
- Weightage to be given for neatness and submission of record/write-up on time.
- Department shall conduct a test of 100 marks after the completion of all the experiments listed in the syllabus.
- In a test, test write-up, conduction of experiment, acceptable result, and procedural knowledge will carry a weightage of 60% and the rest 40% for viva-voce.
- The suitable rubrics can be designed to evaluate each student's performance and learning ability.
- The marks scored shall be scaled down to **20 marks** (40% of the maximum marks).

The Sum of scaled-down marks scored in the report write-up/journal and marks of a test is the total CIE marks scored by the student.

Semester End Evaluation (SEE):

- SEE marks for the practical course are 50 Marks.
- SEE shall be conducted jointly by the two examiners of the same institute, examiners are appointed by the Head of the Institute.
- The examination schedule and names of examiners are informed to the university before the conduction of the examination. These practical examinations are to be conducted between the schedule mentioned in the academic calendar of the University.
- All laboratory experiments are to be included for practical examination.
- (Rubrics) Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered to by the examiners. **OR** based on the course requirement evaluation rubrics shall be decided jointly by examiners.
- Students can pick one question (experiment) from the questions lot prepared by the examiners jointly.
- Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners.

General rubrics suggested for SEE are mentioned here, writeup-20%, Conduction procedure and result in -60%, Viva-voce 20% of maximum marks. SEE for practical shall be evaluated for 100 marks and scored marks shall be scaled down to 50 marks (however, based on course type, rubrics shall be decided by the examiners)

Change of experiment is allowed only once and 15% of Marks allotted to the procedure part are to be made zero.

The minimum duration of SEE is 02 hours

COMPUTER AIDED TEXTILE DESIGNING- LAB	Semester	VI
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Course Code	BTXL657C	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	0:0:2:0	SEE Marks	50
Credits	01	Exam Hours	03
Examination nature (SEE)	Practical		
Course objectives:			
<ul style="list-style-type: none"> • Make students have knowledge of Computer aided textile design. 			
Sl.NO	Experiments		
1	Types of computer graphics.		
2	Colour basics.		
3	Tools used for image creation and editing.		
4	Construction of simple design.		
5	Creating and construction of stripes and checks.		
6	Use of yarn options for developing dobby designs.		
7	Use of effect menu for dobby designing.		
8	Creating fancy yarns using yarn-2000 software.		
Demonstration Experiments (For CIE)			
9	Construction of jacquard designs using jacweave 2000 software.		
10	Developing of printing designs and layer separation.		
11	Designing of garments using TUKA CAD software.		
12	3D simulation of fabric on a model.		
Course outcomes (Course Skill Set):			
At the end of the course the student will be able to:			
<ul style="list-style-type: none"> • Create textile designs • Illustrate the preparation of design for weaving • Demonstrate the simulation of fabric design to view the appearance of the fabric 			

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

Continuous Internal Evaluation (CIE):

CIE marks for the practical course are **50 Marks**.

The split-up of CIE marks for record/ journal and test are in the ratio **60:40**.

- Each experiment is to be evaluated for conduction with an observation sheet and record write-up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments are designed by the faculty who is handling the laboratory session and are made known to students at the beginning of the practical session.
- Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10 marks.
- Total marks scored by the students are scaled down to **30 marks** (60% of maximum marks).
- Weightage to be given for neatness and submission of record/write-up on time.
- Department shall conduct a test of 100 marks after the completion of all the experiments listed in the syllabus.
- In a test, test write-up, conduction of experiment, acceptable result, and procedural knowledge will carry a weightage of 60% and the rest 40% for viva-voce.
- The suitable rubrics can be designed to evaluate each student's performance and learning ability.
- The marks scored shall be scaled down to **20 marks** (40% of the maximum marks).

The Sum of scaled-down marks scored in the report write-up/journal and marks of a test is the total CIE marks scored by the student.

Semester End Evaluation (SEE):

- SEE marks for the practical course are 50 Marks.
- SEE shall be conducted jointly by the two examiners of the same institute, examiners are appointed by the Head of the Institute.
- The examination schedule and names of examiners are informed to the university before the conduction of the examination. These practical examinations are to be conducted between the schedule mentioned in the academic calendar of the University.
- All laboratory experiments are to be included for practical examination.
- (Rubrics) Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered to by the examiners. **OR** based on the course requirement evaluation rubrics shall be decided jointly by examiners.
- Students can pick one question (experiment) from the questions lot prepared by the examiners jointly.
- Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners.

General rubrics suggested for SEE are mentioned here, writeup-20%, Conduction procedure and result in -60%, Viva-voce 20% of maximum marks. SEE for practical shall be evaluated for 100 marks and scored marks shall be scaled down to 50 marks (however, based on course type, rubrics shall be decided by the examiners)

Change of experiment is allowed only once and 15% of Marks allotted to the procedure part are to be made zero.

The minimum duration of SEE is 02 hours

TEXTILE RECYCLING AND FASHION UP CYCLING –LAB		Semester	VI
Course Code	BTXL657D	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	0:0:2:0	SEE Marks	50
Credits	01	Exam Hours	01
Examination nature (SEE)	Practical		
Course objectives:			
•			
Sl.NO	Experiments		
1	Conversion of Ladies T shirt into Kids Nightwear.		
2	Conversion of Ladies T shirt and tank top into Kid's Frock.		
3	Conversion of T shirt and tank top into Kid's a line skirt.		
4	Conversion of Nighty and Frock into Kid's Frock		
5	Conversion of T shirt into Baby Frock		
6	Conversion of T shirt into kid's night pant		
7	Conversion of old shawls and turn them into a skirt		
8	Turn old jeans into a denim headband.		
9	Convert fabric from used garments into throw pillows.		
10	Design reusable shopping bag using used garments.		
Demonstration Experiments (For CIE)			
11	Illustration based on theme 'reimagine previously used items as wearable designs.		
12	Demonstration of all the products developed using fabric obtained from used garments.		
Course outcomes (Course Skill Set):			
At the end of the course the student will be able to:			
<ul style="list-style-type: none"> • Convert ladies T shirts to useful product • Create useful products from old denims. Shawls • Illustrate use of old garments. 			

Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50) and for the SEE minimum passing mark is 35% of the maximum marks (18 out of 50 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course if the student secures a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

Continuous Internal Evaluation (CIE):

CIE marks for the practical course are **50 Marks**.

The split-up of CIE marks for record/ journal and test are in the ratio **60:40**.

- Each experiment is to be evaluated for conduction with an observation sheet and record write-up. Rubrics for the evaluation of the journal/write-up for hardware/software experiments are designed by the faculty who is handling the laboratory session and are made known to students at the beginning of the practical session.
- Record should contain all the specified experiments in the syllabus and each experiment write-up will be evaluated for 10 marks.
- Total marks scored by the students are scaled down to **30 marks** (60% of maximum marks).
- Weightage to be given for neatness and submission of record/write-up on time.
- Department shall conduct a test of 100 marks after the completion of all the experiments listed in the syllabus.
- In a test, test write-up, conduction of experiment, acceptable result, and procedural knowledge will carry a weightage of 60% and the rest 40% for viva-voce.
- The suitable rubrics can be designed to evaluate each student's performance and learning ability.
- The marks scored shall be scaled down to **20 marks** (40% of the maximum marks).

The Sum of scaled-down marks scored in the report write-up/journal and marks of a test is the total CIE marks scored by the student.

Semester End Evaluation (SEE):

- SEE marks for the practical course are 50 Marks.
- SEE shall be conducted jointly by the two examiners of the same institute, examiners are appointed by the Head of the Institute.
- The examination schedule and names of examiners are informed to the university before the conduction of the examination. These practical examinations are to be conducted between the schedule mentioned in the academic calendar of the University.
- All laboratory experiments are to be included for practical examination.
- (Rubrics) Breakup of marks and the instructions printed on the cover page of the answer script to be strictly adhered to by the examiners. **OR** based on the course requirement evaluation rubrics shall be decided jointly by examiners.
- Students can pick one question (experiment) from the questions lot prepared by the examiners jointly.
- Evaluation of test write-up/ conduction procedure and result/viva will be conducted jointly by examiners.

General rubrics suggested for SEE are mentioned here, writeup-20%, Conduction procedure and result in -60%, Viva-voce 20% of maximum marks. SEE for practical shall be evaluated for 100 marks and scored marks shall be scaled down to 50 marks (however, based on course type, rubrics shall be decided by the examiners)

Change of experiment is allowed only once and 15% of Marks allotted to the procedure part are to be made zero.

The minimum duration of SEE is 02 hours

Suggested Learning Resources:

4. Textiles and Clothing Sustainability Recycled and Upcycled Textiles and Fashion, Springer Nature.

VII SEMESTER

TEXTILE TESTING-II	Semester	VII
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