M.D. UNIVERSITY, ROHTAK
SCHEME OF STUDIES AND EXAMINATION effective from 2019-20
Bachelor of Technology (Textile Technology)
Third Semester

Sr No.	Course Code	Course Title	Hours per week			Total Contact hrs/week	Credit	Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P			Class work	Theory	Practical	Total	
1	HSMC-EIE-201G	Entrepreneurial and Industrial Engineeering	3	0	0	3	3	25	75		100	3
2	PCC-TT/TC/FAE-201G	Introduction to Textile Industrial Practices	3	0	0	3	3	25	75		100	3
3	PCC-TT/TC/FAE-202G	Textile Raw Materials	3	0	0	3	3	25	75		100	3
4	PCC-TT-203G	Yarn Manufacture–I	3	0	0	3	3	25	75		100	3
5	PCC-TT-204G	Weaving Preparation	3	0	0	3	3	25	75		100	3
6	PCC-TT-205G	Fabric Manufacture–I	3	0	0	3	3	25	75		100	3
7	LC-TT/TC/FAE-201G	Textile Industrial Survey	0	0	2	2	1	25		25	50	3
8	LC-TT/TC/FAE-202G	Fibre Microscopy & Identification	0	0	2	2	1	25		25	50	3
9	LC-TT-203G	Spinning Lab–I	0	0	2	2	1	25		25	50	3
10	LC-TT-204G	Weaving Lab–I	0	0	2	2	1	25		25	50	3
11	*MC-105G	Indian Constitution	0	0	2	2	0	50	-			
Total							22				800	

*MC- 105G is a mandatory non credit course in which the student will be required passing marks

M.D. UNIVERSITY, ROHTAK
SCHEME OF STUDIES AND EXAMINATION effective from 2019-20
Bachelor of Technology (Textile Technology)
Fourth Semester

Sr No.	Course Code	Course Title	Hours per week			Total Contact hrs/week	Credit	Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P			Class work	Theory	Practical	Total	
1	BSC-MATH-201G	Applied Statistics & Operation Research	3	0	0	3	3	25	75		100	3
2	ESC-TT/TC/FAE-201G	Computer Aided Textile Designing	2	0	2	3	3	25	75		100	3
3	PCC-TT/TC-206 G	Man-Made Fibre Production	3	0	0	3	3	25	75		100	3
4	PCC-TT-207 G	Yarn Manufacture–II	3	0	0	3	3	25	75		100	3
5	PCC-TT-208 G	Fabric Manufacture–II	3	0	0	3	3	25	75		100	3
6	PCC-TT-209 G	Fabric Structure	3	0	0	3	3	25	75		100	3
7	ESC-TT/TC/FAE - 202G	Computer Aided Textile Designing Lab	0	0	2	2	1	25		25	50	3
8	LC-TT-205G	Spinning Lab–II	0	0	2	2	1	25		25	50	3
9	LC-TT-206G	Weaving Lab–II	0	0	2	2	1	25		25	50	3
10	LC-TT-207G	Fabric Analysis Lab	0	0	2	2	1	25		25	50	3
11	*MC-108G	Essence of Indian Knowledge Tradition	0	0	2	2	0	50	-			
Total							22				800	

NOTE: At the end of 4th semester each student has to undergo Practical Training of 4/6 weeks in an Industry/ Institute/ Professional Organization/ Research Laboratory/ training centre etc. and submit typed report along with a certificate from the organization & its evaluation shall be carried out in the 5th Semester.

*MC- 108G is a mandatory non credit course in which the student will be required passing marks

HSMC–EIE–201G Entrepreneurial and Industrial Engineeering

Course code	HSMC–EIE–201G				
Category	Humanities and Social science including Management courses				
Course title	Entrepreneurial and Industrial Engineeering				
Scheme and Credits	L	T	P	Credits	Semester–III
	3	0	0	3	
Branch	Textile Technology, Textile Chemistry, Fashion & Apparel Engineering				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic concepts of Social Sciences

Course Objectives:
The course is designed to make the students understand the:

- concepts of Entrepreneurship and Entrepreneurial Skills;
- ways of preparation of project reports, their components and feasibility studies
- principles of management;
- concepts of Industrial Engineering.

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 06 parts of 2.5 marks from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT I

Entrepreneurship: Meaning and concept, role of entrepreneurship in economic development & new economic reforms, Entrepreneurial Skills, decision process, Facors influencing entrepreneurship; Business Opportunity Identification; Preparing a Business Plan and projet reports, Significance, components and feasibility studies of business plans/project reports, Importance of new venture financing, sources of financing

UNIT II

Industrial Parks (Meaning, features with examples); Special Economic Zone (Meaning, features with examples); Financial institutions and agencies, MSME, Small Scale Industries, Introduction to SIDBI, IDBI, IFCI and various Governement agencies like NABARD etc, Carry on Business (COB) licence, Environmental Clearance, Introduction to various industrial hazards like fire, mechanical and electrical etc, Introduction to safety rules for prevention of accidents, National

Small Industries Corporation Rules and regulations for exemption from income tax, excise clearance etc., Claiming of draw back in export business.

UNIT III

Productivity – importance, concepts and measurements, Work study, Method study, micro -motion study, Production planning and control- Importance of planning - job, batch and mass production- Introduction and need for a new product, Functions of production control at macro and micro levels - Routing , Scheduling, dispatching and follow up etc. Ergonomics and its importance

UNIT IV

Introduction to Industrial Engineering - Evolution of modern Concepts in Industrial Engineering - Functions of Industrial Engineering, application of Industrial Engineering. Facility location factors and evaluation of alternate locations, Types of plant layout and their evaluation, Assembly line balancing, Materials handling systems, Inventory Control, inventory control techniques. Job evaluation, merit rating, incentive schemes, and wage administration, Quality control and Inspection.

Reading List

Title	**Author**
Project Feasibility Analysis	Cliffon, Davis S & Fyfie, David E
Environment & Entrepreneur	A N Desai
Environment & Entrepreneur	P F Drucker
Planning a Small Scale Industry: A Guide to Entrepreneurs	R Jain
Developing Entrepreneurship-A Handbook Learning System	Pareek, Udai and Venkateswara Rao
Motion and Time study	Ralph M Barnes
Engineered work Measurement	Weldon, ELBS, Marvin E Mundel
Work Study and Ergonomics	S Dalela and Sourabh
Introduction to Work Study	ILO
Work Study	Ralph & Barnes

Course Outcomes

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

- Take the right decisions to optimize resources utilization by improving productivity of the Materials, Machines, Money, Methods, Manpower and Management effectively;
- find alternative best productive methodsreducing time, improving human efficiency and minimising waste;
- understand the functions and applications of Industrial Engineering.

PCC–TT/TC/FAE–201G Introduction to Textile Industrial Practices

Course code	**PCC–TT/TC/FAE–201G**				
Category	Professional Core Course				
Course title	Introduction to Textile Industrial Practices				
Scheme and Credits	L	T	P	Credits	Semester–III
	3	0	0	3	
Branch	Textile Technology, Textile Chemistry, Fashion & Apparel Engineering				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Science subjects of Physics, Chemistry and Mathematics **Course Objectives:**

- To familiarize the students with different sectors of textile industry
- To make students learn about processes involved in yarn and fabric formation
- Understanding sequence of fabric chemical processing and garment designing processes
- Calculations pertaining to yarn numbering systems

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 06 parts of 2.5 marks from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT-I

Introduction to different sectors of textile industry (organized as well as unorgnanized) including sectors based on technology such as Handloom, Powerloom, Garment, Cotton, Silk, Wool, Jute and Synthetics etc., Global Scenerio of these sectors: Number of units, size etc
Idea of Research and technology support to Textile Industry by Government Agencies; Strengths and weaknesses of Indian Textile Industry

UNIT-II

Brief outline of Ginning, Sequence of operations for conversion of natural and manmade fibers into yarn viz Opening and Cleaning, drawing, combing, roving and different spinning processes. Introduction to doubling and winding;
Introduction to passage of material through weaving preparatory and fabric formation processes viz, weaving, knitting and nonwoven by flow charts and their objectives. Calculations pertaining to yarn numbering systems

UNIT-III

Introduction to various textile chemical processes, General sequence used for chemical processing of textile materials viz fibre, yarn, fabric and garments. Brief outlines of various preparatory processes such as singeing, desizing, scouring, bleaching, mercerizing, etc., Overview of colouration processes viz dyeing and printing of textile materials, Introduction to different mechanical and chemical finishing processes. Basic idea of garment and knit processing processes.

UNIT-IV

Sequence of operations for converting fabric to garment, Importance of Design; Introduction to fashion and retailing of readymade garments, Branding, Awareness of treams and accessories, Different sectors of garment manufacturing units, export houses, buying houses. Brief idea of garment imports/exports of different countries

Reading List

Title	**Author**
Cotton Spinning	K Ganesh & A R Garde
Cotton Yarn Weaving	RN Kanungi & AR Garde
Principles of Weaving	Marks & Robinson
Textiles Fibre to Fabric	Corbmann
Fundamental Principles of Textile Processing	V A Shenai
Technology of Clothing Manufacture	Carr & Latham

Course Outcomes:

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

- take the right decisions to optimize resources utilization by improving productivity of the Materials, Machines, Money, Methods, Manpower and Management effectively;
- find alternative best productive methodsreducing time, improving human efficiency and minimising waste;
- understand the functions and applications of Industrial Engineering.

PCC–TT/TC/FAE–202G Textile Raw Materials

Course code	**PCC–TT/TC/FAE–202G**				
Category	Professional Core Course				
Course title	Textile Raw Materials				
Scheme and Credits	L	T	P	Credits	Semester–III
	3	0	0	3	
Branch	Textile Technology, Textile Chemistry, Fashion & Apparel Engineering				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Science subjects of Physics, Chemistry and Mathematics **Course Objectives:**

- To provide basic knowledge of terms used in textiles
- To familiarize the students with details of raw materials used in textile industry
- To make students learn about natural and man made fibre details

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 06 parts of 2.5 marks from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT-I

General definitions and important terminologies related to textiles; Classification of fibres; Essential and desirable properties of textile fibres and their role in final products; Advantages and disadvantages of natural and manmade fibres;
Cotton: Geographical distribution, structure and properties (physical and chemical); Different varieties including organic as well as Bt cotton and their properties; Applications.

UNIT-II

Bast and leaf fibres such as jute, hemp, sisal and ramie etc: Geographical distribution, extraction, properties and their uses.
Varieties of natural silk, rearing of silk worm, properties and uses of various types of silk; silk reeling, throwing and weighing.

UNIT-III

Varieties, sorting and grading of wool, chemical and physical properties of wool, processes involved in the removal of impurities from raw wool, numbering systems of woollen and worsted yarns. General principles of manufacturing of man made fibres.

UNIT-IV

Brief outline of the manufacturing processes of important man-made fibres, viz. rayons (Viscose andAcetate), polynosic, tencel, nylons, polyester, acrylics, polypropylene, polyolefins, polyacrylonitrile and some technical speciality fibres like spandex/lycra etc (only flow charts); their Important physical and chemical properties and applications.

Reading List

Title	**Author**
Handbook of Textile Fibres	J Gordon Cook
Textile Fibres	HVS Murthy
Manufactured Fibre Technology	V B Gupta & V K Kothari

Course Outcomes:

At the end of the course, the students will be:

- familiar with different types of natural and man made fibres
- having the knowledge of physical and chemical properties of natural and man made fibres
- able to explore the applications of different types of natural and man made fibres

PCC–TT–203G Yarn Manufacture–I

Course code	**PCC–TT–203G**				
Category	Professional Core Course				
Course title	Yarn Manufacture–I				
Scheme and Credits	L	T	P	Credits	Semester–III
	3	0	0	3	
Branch	Textile Technology				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Science subjects of Physics, Chemistry and Mathematics **Course Objectives:**

- To familiarize the students with objectives of initial stages of yarn formation viz. Ginning, Mixing and Blending
- To make the students understand basic mechanisms involved in preparatory stages of yarn formation viz. Blowroom and Card
- To make students learn calculations related to preparatory stages of yarn formation viz. Blowroom and Card

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 06 parts of 2.5 marks from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT I

Brief introduction of the subject; Objectives of ginning, Pre-ginning and post-ginning operations and their significance, description and working of knife roller, McCarthy and saw gin; cotton contamination

Mixing and Blending: Objectives; Different methods along with advantages and disadvantages; Selection of cottons for particular mixing: different methods and principles involved; Tinting; Application of additional spin finish; function and levels;

UNIT II

Blowroom: Objectives; Components and accessories; Various types of openers, cleaners and mixers, their construction and working; Piano feed regulating motion; Design of cone drums; Lap forming

mechanism; Selection of blow room lines for different cotton mixings and man-made fibres; Production and efficiency levels attainable, related calculations

UNIT III

Performance assessment of Blow room, Lap rejection, causes of lap defects and their remedies, Modern developments in blow room.
Carding: Objectives; Introduction to roller and clearer card; Principles of carding, stripping and brushing action; Design and construction of various parts and machine as a whole; Different zones of a carding machine; Design criteria for a high production card; Calculations related to a carding machine

UNIT IV

Analysis of carding forces; Mechanics of neps and hooks formation and their control; Carding of micro denier and dyed fibres; flexible and metallic card clothing; Design of wire points for processing different materials; Auto levelling at card; Performance assessment of a Card; Grinding of wire points: purpose, types and frequency; Modern developments in carding;

Reading List

Title	**Author**
Cotton Ginning, Textile Progress Vol.24 No.2 I	Doraiswamy, P Chellamani
Spun Yarn Technology, Vol I& II	A Venkatasubramani
Short Staple Spinning Volume-I, II, III & IV	W Klein
Spinning of Manmade & Blends on Cotton Systems	KR Salhotra
Technology of Carding	R Chattopadhyay

Course Outcomes

At the end of the course, the students will:

- have the knowledge of Ginning, Mixing and Blending, the initial processes of yarn formation;
- have learnt the principle and working of different machines of blowroom;
- be familiar with the working of carding machine along with the functions of its parts;
- be able to calculate various parameters like draft, production and efficiency related to Blowroom and card.

PCC–TT–204G Weaving Preparation

Course code	**PCC–TT–204G**				
Category	Professional Core Course				
Course title	Weaving Preparation				
Scheme and Credits	L	T	P	Credits	Semester–III
	3	0	0	3	
Branch	Textile Technology				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Science subjects of Physics and Mathematics **Course Objectives:**

The course is designed to make the students understand the:

- concepts of yarn linear density and yarn faults
- types of packages used in textile operations
- types and mechanism of winding, warping and sizing machines
- related production calculations

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 06 parts of 2.5 marks from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT I

Introduction to the subject; Winding: Process description, Objectives, types of winding, (Random & Precision), their principle and comparison.
Devices used on winding machines: Tensioners-Objective, principle, types, performance assessment; Clearers-Objectives, types, their principle, performance assessment; other devices with their objectives.

UNIT II

Yarn faults and their classification systems, Phenomenon of patterning and Anti patterning methods. Knots and splices; Brief idea of types of Splicers and their principle. Definitions of wind, Traverse Ratio, Coil angle, wind angle, Net winding Rate, gain and their related calculations. General calculations for efficiency and production, package faults in winding, modern developments in winding.

Pirn winding: Objective and process description in brief.

UNIT III

Warping: Process description, objectives, Direct and sectional warping, principle of working, relative merits and demerits, application area. Components of warping machines with objectives; types of creel, steps of section formation, Differences between warpers' and weavers' beam. Package faults, modern developments in warping. Calculations pertaining to direct and sectional warping including production and efficiency

Sizing: Process description and objectives of sizing. Passage of material through a Slasher Sizing machine

UNIT IV

Different zones of slasher sizing machine: creel, size box and its components, drying zone and head stock and their details. Size box controls, Sizing parameters: definition and relation, Sizing ingredients and their types; Size recipe for common yarns like cotton, polyester, viscose, nylon, acrylic. Factors affecting size add on. Package faults in sizing. Calculations related to production and efficiency. Developments in Slasher sizing machine; Other sizing techniques like HPS, Single end sizing, foam sizing, sinter roller sizing, and cold sizing

Leasing, Drawing-in and tying in: Objectives and process description.

Reading List

Title	**Author**
Fundamentals of Yarn Winding	Milind Koranne, Woodhead India Publications
Weaving: Conversion of Yarn to Fabric	R Lord, M H Mohamed, Woodhead Publishing
Yarn Winding	NCUTE Publication
Weaving: Technology and Operations	Ormerod
Yarn Preparation for Handloom weaving	B K Behera
Textile Mathematics Vol. III	JE Booth
Textile Sizing	B C Goswami, R D Anandjiwala, D Hall
Sizing: Materials, Methods, Machines	Ajgaonkar, Talukdar, Wadekar
Sizing	J B Smith

Course Outcomes:

After completion of the course, students will be able to:

- understand the fundamentals of yarn laying on a package
- understand the mathematical relations for better package production of winding and warping packages
- comprehend the mechanism and working different weaving preparatory methods adopted for efficient weaving
- understands the production calculations at different stages

PCC–TT–205G Fabric Manufacture–I

Course code	**PCC–TT–205G**				
Category	Professional Core Course				
Course title	Fabric Manufacture–I				
Scheme and Credits	L	T	P	Credits	Semester–III
	3	0	0	3	
Branch	Textile Technology, Textile Chemistry, Fashion & Apparel Engineering				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Science subjects of Physics, Chemistry and Mathematics **Course Objectives:**

The course is designed for the students to learn:

- basic concepts of woven fabric formation;
- types of looms, different motions in a loom;
- types and mechanism of primary, secondary and auxiliary motions in shuttle looms;
- related production calculations.

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 06 parts of 2.5 marks from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT I

Brief introduction to the subject; Classification of looms: Plain loom, automatic shuttle loom and shuttle-less looms. Definitions of primary, secondary and auxiliary motions of a loom

Shedding motion on the loom: Tappet shedding: types of tappet shedding (positive and Negative), Negative tappet shedding – relative throw of cams, Heald shaft reversing motion.

Dobby Shedding: Negative Dobby shedding – mechanism of Keighley dobby, preparation of pattern chain for it.

Jacquard shedding: Mechanism of single lift-single cylinder, Double lift-single cylinder, Double lift-Double cylinder. Jacquard harness: different harness ties, e.g. Straight, Pointed and Border Tie, card punching for Jacquard.

UNIT II

Types of shed-Bottom closed, Semi-open, Center closed and open-sheds, their advantages and uses, comparison of Tappet, Dobby and Jacquard shedding.

Picking motion on the loom: Types of picking: conventional picking mechanisms: over-pick and under-pick, shuttle checking, checking devices, Calculations for power requirement for picking, shuttle flight time.
Study of picking mechanism as simple elastic system, nominal and actual picker displacement curves, Shuttle retardation curve during checking
Beat-up motion on the loom: Sley motion, Factors affecting sley motion, Sley eccentricity and its effects, Kinematics of loom sley in normal conditions. Loom timings for shedding, picking and beat-up motions.

UNIT III

Cloth control: Take-up motion – Objective, types, Five and seven-wheel take-up mechanisms, their comparison. Changes in Pick density, change places, expression for Pick density, Calculation of periodicity in pick variation due to faulty teeth or wheel eccentricity, Shirley take-up.
Temples - Function, types. Warp control: Objective, types. Let-off mechanisms (negative friction type, Bartlett let-off).
Warp stop motion: Objective, types. Mechanical and electrical warp stop motion.

UNIT IV

Weft stop motion: Objective, types, side weft fork and center weft fork motion.
Warp protector motion: Objective, types, Loose Reed, Fast Reed warp protector motion.
Automatic pirn change mechanism: Objective, feeler and types of feeler, change mechanism.
Bobbin loader and loom winder.
Weft mixing and weft patterning: four-box motion, pick at will.
Loom drive; rpm, efficiency and production calculations

Reading List

Title	**Author**
Principles of Weaving	R Marks & ATC Robinson
Weaving: Conversion of yarn to Fabric	Lord and Mohammed
Weaving: Technology & Operations	Ormerod
Weaving: Machines, Mechanisms, Management	Ajgaonkar et al
Woven Fabric Production – I, II	NCUTE Publications
Weaving Mechanism, I & II	NN Banerjee

Course Outcomes:
After completion of the course, students will have the knowledge of:

- different loom types and their motions
- mechanism and working of different motions in shuttle looms
- calculating the production of looms

LC–TT/TC/FAE–201G Textile Industrial Survey

Course code	**LC–TT/TC/FAE–201G**				
Category	Professional Core Course				
Course title	Textile Industrial Survey				
Scheme and Credits	L	T	P	Credits	Semester–III
	0	0	2	1	
Branch	Textile Technology, Textile Chemistry, Fashion & Apparel Engineering				
Class work	25 Marks				
Exam	25 Marks				
Total	50 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Science subjects of Physics, Chemistry and Mathematics **Course Objectives:**

- The course is designed to make students learn writing reports of survey/practical visits to textile industrial units

Contents:

Study and survey of textile industries spread over India as well as Global areas specifically in nearby places, through practical visits and internet facilities; Preparation of report of the survey and highlight salient features of specific sectors involved like spinning, weaving, knitting, process house, garment manufacturing, Label manufacturing, export and buying houses etc

Course Outcomes:

- At the end of this course the students will be able to survey and prepare the reports of any Industrial unit specifically in textile fields

LC–TT/TC/FAE–202G Fibre Microscopy & Identification

Course code	LC–TT/TC/FAE–202G				
Category	Professional Core Course				
Course title	Fibre Microscopy & Identification				
Scheme and Credits	L	T	P	Credits	Semester–III
	0	0	2	1	
Branch	Textile Technology, Textile Chemistry, Fashion & Apparel Engineering				
Class work	25 Marks				
Exam	25 Marks				
Total	50 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Science subjects of Physics, Chemistry and Mathematics, Textile Raw Materials **Course Objectives:**

The Lab course is designed to make students learn

- identification of textile fibres and filaments
- identify the burning behaviour, microscopical structure and chemical solubility of different textile fibres
- blend analysis

Contents

Principle of microscopy, Microscopic identification of fibres, preparation and mounting of specimen for longitudinal view, Cross-section cutting. Microtomy - cork method, metal plate method, Hardy's Microtome, Mountants and reagents for fibre microscopy; Identification of fibres through burning as well as solubility tests. Standard schemes of analysis of homogenous fibre blends by physical and chemical methods; Qualitative and quantitative determination of components; Preparation of reagents used for chemical analysis.

Reading List

Title	**Author**
Hand book of textile fibres	J Gordan Cook
Textile Fibres	HVS Murthy

Course Outcomes:

After completion of the course, students will have the knowledge of:

- the burning tests, microscopic tests and solubility tests for identification of the textile fibers
- cemistry involved in various practical tests
- various tests for analysis of blends of two or more fibres

LC–TT–203G Spinning Lab–I

Course code	**LC–TT–203G**				
Category	Professional Core Course				
Course title	Spinning Lab–I				
Scheme and Credits	L	T	P	Credits	Semester–III
	0	0	2	1	
Branch	Textile Technology				
Class work	25 Marks				
Exam	25 Marks				
Total	50 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Science subjects of Physics, Chemistry and Mathematics, Yarn Manufacture-I **Course Objectives:**

- This Lab course is designed to impart first-hand experience of handling blowroom and carding machines thus serving as a bridge between theory and practice.

Contents

Practice in handling and operation of blow room, study of constructional details of machinery in blow room, Calculating speeds of different machine parts, Blow/inch of Kirschner beater, Production calculation of blow room, various control points and change places, Practice in checking of the quality of lap.

Familiarity with carding machine, constructional details, change places and speed calculation of a carding machine, Effect of various machine parameters in production and quality of sliver, checking the quality of sliver, Finding out individual draft and total draft in carding machine. Flat speed and its impact, Study of coiling mechanism, coils/layer. Setting points according to type of material.

List of Experiments:

1. Draw the flow of material through Lakshmi Rieter (LR) blowroom line and discuss the functions of each machine.

2. Draw the flow of material through Mixing Bale Opener (MBO). Also draw its gearing diagram and calculate the speeds of different parts.

3. Draw the flow of material through ERM cleaner. Also draw its gearing diagram and calculate the speeds of different parts.

4. Draw the flow of material through Kirschner Beater. Draw the gearing diagram of Scutcher and calculate
    - Speed of different parts of the machine;
    - Draft between different calendar rollers;
    - Draft between calendar roller and shell roller;
    - Production of blowroom line by assuming suitable data.

5. To study the objectives of CARDING machine. Draw the flow of material through a card and label various parts.

6. To study the following aspects of an existing card in the lab:
    - Gearing plan;
    - Calculation of rotational and surface speeds of different rollers;
    - Calculation of zonal drafts and total drafts between different rollers;
    - Calculation of actual draft from mechanical draft and waste%;
    - Draft constant and production constant using different methods;
    - Calculation of production assuming suitable data
    - Calculation of sliver coils per layer in the can;
    - Different change places

Course Outcomes:

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

- understand the blowroom line and sequence of machines in the blowroom line;
- practically handle and set the blowroom line for processing different materials;
- practically handle and set a card for processing different materials.

LC–TT–204G Weaving Lab–I

Course code	**PCC–TT–204G**				
Category	Professional Core Course				
Course title	Weaving Lab–I				
Scheme and Credits	L	T	P	Credits	Semester–III
	0	0	2	1	
Branch	Textile Technology				
Class work	25 Marks				
Exam	25 Marks				
Total	50 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basics of Physics, Chemistry, Math, Weaving Preparation and Fabric Manufacture-I **Course Objectives:**

- This Lab course is designed to impart first-hand experience of weaving preparatory machines and their settings. It also helps students practically understand the primary motions of shuttle loom.

Contents:

Study of winding, warping, slasher sizing: primary components and their functioning, operation, settings, related calculations, production, efficiency, package types, faults and their remedies.
Drawing-in process: Process description, drafting/denting plans Pirn winding: objective and functioning in brief.
Introduction to loom and its primary parts, passage of material through it.
Study of shedding (negative cam, dobby, jacquard), picking and beat-up mechanisms in shuttle looms: construction, working and related calculation/settings.

List of Experiments

1. Study of Winding Process
2. Study of Warping Process
3. Study of Slasher Sizing
4. Study of Drawing-in Process
5. Study of Pirn Winding Process
6. Introduction to Shuttle Loom
7. Study of Conventional Shedding Mechanisms
8. Study of Shuttle Picking Mechanisms
9. Study of Crank Beat-up Mechanism in Shuttle loom

Course Outcomes:

After completion of the course, students will be able to:

- correlate between theory and practice of the concept of weaving preparatory methods
- visualise the layout and structure of weaving preparatory machines along with their primary components
- visualise the mechanisms of primary motions of shuttle weaving machines and comprehend their settings
- develop practical skills relevant to industrial practices.

CONSTITUTION OF INDIA

Class Work : 50

Course Code	MC-105G		
Category	**Engineering Science Course**		
Course title	**Constitution of India** (Theory)		
Scheme	**L**	**T**	**P**
	0	0	2

CONSTITUTION OF INDIA– BASIC FEATURES AND FUNDAMENTAL PRINCIPLES

The Constitution of India is the supreme law of India. Parliament of India can not make any law which violates the Fundamental Rights enumerated under the Part III of the Constitution. The Parliament of India has been empowered to amend the Constitution under Article 368, however, it cannot use this power to change the "basic structure" of the constitution, which has been ruled and explained by the Supreme Court of India in its historical judgments. The Constitution of India reflects the idea of "Constitutionalism" – a modern and progressive concept historically developed by the thinkers of "liberalism" – an ideology which has been recognized as one of the most popular political ideology and result of historical struggles against arbitrary use of sovereign power by state. The historic revolutions in France, England, America and particularly European Renaissance and Reformation movement have resulted into progressive legal reforms in the form of "constitutionalism" in many countries. The Constitution of India was made by borrowing models and principles from many countries including United Kingdom and America.

The Constitution of India is not only a legal document but it also reflects social, political and economic perspectives of the Indian Society. It reflects India's legacy of "diversity". It has been said that Indian constitution reflects ideals of its freedom movement, however, few critics have argued that it does not truly incorporate our own ancient legal heritage and cultural values. No law can be "static" and therefore the Constitution of India has also been amended more than one hundred times. These amendments reflect political, social and economic developments since the year 1950.

The Indian judiciary and particularly the Supreme Court of India has played an historic role as the guardian of people. It has been protecting not only basic ideals of the Constitution but also strengthened the same through progressive interpretations of the text of the Constitution. The judicial activism of the Supreme Court of India and its historic contributions has been recognized throughout the world and it gradually made it "as one of the strongest court in the world".

COURSE CONTENTS

1. Meaning of the constitution law and constitutionalism.
2. Historical perspective of the Constitution of India.
3. Salient features and characteristics of the Constitution of India.
4. Scheme of the fundamental rights.
5. The scheme of the Fundamental Duties and its legal status.
6. The Directive Principles of State Policy – Its importance and implementation.
7. Federal structure and distribution of legislative and financial powers between the Union and the States.
8. Parliamentary Form of Government in India – The constitution powers and status of the President of India
9. Amendment of the Constitutional Powers and Procedure
10. The historical perspectives of the constitutional amendments in India
11. Emergency Provisions : National Emergency, President Rule, Financial Emergency
12. Local Self Government – Constitutional Scheme in India
13. Scheme of the Fundamental Right to Equality
14. Scheme of the Fundamental Right to certain Freedom under Article 19
15. Scope of the Right to Life and Personal Liberty under Article 21

REFERENCES:

1. The Constitutional Law Of India 9th Edition, by Pandey. J. N.
2. The Constitution of India by P.M.Bakshi
3. Constitution Law of India by Narender Kumar
4. Bare Act by P. M. Bakshi

BSC–MATH–201G Applied Statistics & Operation Research

Course code	**BSC–MATH–201G**				
Category	Basic Science Course				
Course title	Applied Statistics & Operation Research				
Scheme and Credits	L	T	P	Credits	Semester–IV
	3	0	0	3	
Branch	Textile Technology, Textile Chemistry, Fashion & Apparel Engineering				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Mathematics and Statistics

Course Objectives:

- To develop statistical and probability based skills amongst the students
- To make the students learn basic tools of Operations Research used in solving managerial problems

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 06 parts of 2.5 marks from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT I

Basic Statistics:

Measures of Central tendency, Dispersion, moments, skewness and Kurtosis (definition, properties and associated numerical only); Correlation, Karl Pearson's coefficient of correlation, rank correlation, line's of regressionand curve fitting (linear and parabolic)

UNIT II

Probability and Probability Distributions:

Concept of probability, additive and multiplicative laws of probability (Statements and associated numerical only);

Random variate: Mathematical expectation, theorems on expectation, discrete and continuous probability distributions (definition and problems only); Univariate Binomial, Poisson and Normal distributions (properties and applications)

UNIT III

Sampling & Testing of hypothesis

Population and sample, types of sampling, sampling distribution of means and proportions (definition only)

Definition of statistical hypothesis, null hypothesis, type I and type II errors and level of significance. Tests of significance for large and small samples (discussion) problem based on χ^2 test for goodness of fit, t-test, F-test and Analysis of variance (one way and two way classifications)

UNIT IV

Operations Research

Linear programming problem (formulation and solution by graphical approach only); Transportation problem including time minimizing problems, Basic Assignment problem, sequencing problems (n jobs, 2 machines and n jobs, m machine problems);

Project scheduling by PERT/CPM: Definition of network, critical path, floats, finding of critical path and floats.

Reading List

Title	**Author**
Mathematical Statistics	Ray and Sharma
Business Statistics	Gupta & Gupta
Theory and problems of probability and Statistics	Murray P Spiegel
Operation Research	P.K. Gupta, Manmohan
Operations Research for Management	Gupta & Sharma
Higher Engineering Mathematics	B.S. Grewal

Course Outcomes:

After completion of the course, students will have the knowledge of:

- basic statistical parameters of measures of central tendency, dispersion, correlation, regression etc
- the concept of probability and probability distributions
- the concept of testing of hypothesis based upon sampling
- the concept of linear programming, transportation, assignment, sequencing problems as well as PERT/CPM

ESC–TT/TC/FAE–201G Computer Aided Textile Designing

Course code	**ESC–TT/TC/FAE–201G**				
Category	Professional Core Course				
Course title	Computer Aided Textile Designing				
Scheme and Credits	L	T	P	Credits	Semester–IV
	3	0	0	3	
Branch	Textile Technology, Textile Chemistry, Fashion & Apparel Engineering				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Science subjects of Physics, Chemistry, Mathematics and Computer **Course Objectives:**

- To introduce computer softwares and hardwares related to textile designing;
- To make students learn basic tools and designing techniques used in textile and Apparel sectors;
- To make students understand applications of CAD for colour and weave designs.

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 06 parts of 2.5 marks from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT I

Fundamentals of CAD: Definition, History, Hardware and Software requirements of CAD, Design Process, Application areas of computer aided design and manufacturing in textile and apparel industry, Introduction to Computer Graphics, Raster and Vector Graphics features.

UNIT II

Hardware in CAD: Introduction, Design workstation, Graphics terminal, input and output devices, central processing unit and secondary storage. Arrangement of figures - unit-repeating design, the drop device, drops reverse designs, system of distribution with reference to diamond base, ogee base, and rectangular base lines. Construction of designs from incomplete repeat, classification of borders patterns, all over patterns and types

UNIT III

Selection tools in adobe Photoshop: selection by shape, colour and mask, Colour specification tools, Image adjustment modes, layer blending modes and their options. Different brush tools and their dynamics options, Colour fill: Paint and gradiant, Clone tool, colour modification via dodge, burn, colour replacement, mixer etc. Layer masking, Texture mapping, Filter applications for fancy effects, layer functions, working with displacement maps, texture maps. Basic vector shape drawing tools, shape editing via anchor points etc.

UNIT IV

Introduction to Corel Draw Interface Tool Box, Working with shape drawing tools for lines, rectangles, squares, circles, ellipses, polygons, starts and spirals etc. Object transformations as rotation, scaling etc. freely and for specific dimensions, Selecting Objects, reshaping, duplicating, grouping, trimming, locking and unlocking, aligning objects. Introduction to curves, nodes and segments; Drawing freehand tools; Drawing and selecting closed curves and nodes, adding, removing and joining nodes. Bezier tool, drawing curve and straight line with bezier tools, Colour fill and options

Reading List

Title	**Author**
Computer Aided Design & Manufacturing	Mikcle P Groover, Emory W.Zimmers Jr
Computer Graphics Principles & Practices	James D Foley, Andeies Van Da Shvan K Feiner. John F Hughes
Computer Graphics	Donald Mearn & M Pauline, Baker
"Watsons Textile Design and Colour"	Grosiciki, Newnes Buttersworth, 1988

Course Outcomes:

After completion of the course students will:

- be familiar with computer fundamentals for Computer Aided Designing
- have the knowledge of computer softwares and basic tools for textile designing
- know the elements and principles of design and their applications in textile designing through CAD

PCC–TT/TC–206 G Man–Made Fibre Production

Course code	**PCC–TT/TC–206 G**				
Category	Professional Core Course				
Course title	Man–Made Fibre Production				
Scheme and Credits	L	T	P	Credits	Semester–IV
	3	0	0	3	
Branch	Textile Technology, Textile Chemistry				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Science subjects of Physics, Chemistry and Mathematics **Course Objectives:**

The course is designed to make students learn:

- the basic concepts of fibre forming polymers
- various manufacturing systems of man made fibres
- processes and chemical reactions involved during manufacturing of typical fibres

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 06 parts of 2.5 marks from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT I

General definitions related to man-made/manufactured fibres. Introduction to manufacturing processes of these fibres. Study of various spinning systems: melt, wet & dry spinning – basic principles. Brief details of spinning head, spinneret, quench chamber, drying chamber & coagulation bath. Spin finish applications.

UNIT II

Regenerated fibres: Viscose rayon – detailed manufacturing process with reactions at each stage. Polynosics, Super high wet modulus rayons, Brief manufacturing processes of Lyocell and Tencel fibres.

UNIT III

Polyacrylonitrile: Addition of comonomers, continuous suspension, polymerization techniques; Solution spinning techniques; Coagulation bath variables; Macrovoid generation and their remedies; Effect of spinning variables on structure and properties of gel and final fibres.
Polypropylene: Polymerisation techniques (suspension & gas phase), Superactive catalysts and their composition; major drawbacks and their possible remedies; Spinning of filaments.

UNIT IV

Polyethylene terephthalate: Polymerisation techniques (batch & continuous), side reactions, degradation reactions – their control, Production of filament yarns and staple fibres, Brief description of manufacturing technique of high tenacity polyethylene terephthalate.
Nylon 6 & nylon 66: Polymerisation techniques in VK tube (batch & continuous) along with side reactions, Integrated continuous process for nylon 66, Filament spinning technique.

Reading List

Manmade fibres	RW Moncrieff
Manufactured Fibre Technology	V. B. Gupta and V.K. Kothari
Production of Synthetic Fibres	A.A. Vaidya

Course Outcomes:
After completion of the course, students will:

- have the knowledge of essential requirements for fibre forming polymers
- be familiar with different techniques of fibre production systems
- have the knowledge of raw materials used for producing different man made fibres;
- be familiar with the chemical reactions occcuring during the manufacture of typical fibres

PCC–TT–207 G Yarn Manufacture–II

Course code	**PCC–TT–207 G**				
Category	Professional Core Course				
Course title	Yarn Manufacture–II				
Scheme and Credits	L	T	P	Credits	Semester–IV
	3	0	0	3	
Branch	Textile Technology				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Science subjects of Physics, Chemistry and Mathematics, Yarn Manufacture–I **Course Objectives:**

- To familiarize the students with objectives of intermediate preparatory stages of yarn formation viz. draw frame, sliver lapper, ribbon lapper and comber
- To make the students understand basic mechanisms involved in intermediate preparatory stages of yarn formation viz. draw frame, sliver lapper, ribbon lapper and comber
- To make students learn calculations related to intermediate preparatory stages of yarn formation viz. draw frame, sliver lapper, ribbon lapper and comber

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 06 parts of 2.5 marks from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT I

Objectives of draw frame, Principle of roller drafting and weighting in draw frame, Concept of Ideal drafting and drafting wave, drafting forces, drafting roller arrangements, doubling, blending and hooks removal at draw frame, coiling systems. Principle of roller setting, Processing of cotton and man-made fibre on draw frame, Auto-levelling, Roller lapping–reasons and remedies, Performance assessment of Draw frame, Calculation related to draw frame, modern developments in draw frame.

UNIT II

Objectives of lap preparation, system of lap preparation, study of sliver lapper, ribbon lapper and super lapper machines, Modern concept of lap preparation, Configuration of fibre feed and its effect on quality of product;

Objectives of Combing, noil percentage and fractionation efficiency of comber, Different types of comber, detailed study of the Nasmith type comber, Timing diagram for combing operation.

UNIT III

Timing and setting of comber for different classes of cotton, control of noil percentage, Type of feed, Influence of type of feed on noil extraction and cleanliness of sliver, Performance assessment of Combing, Calculations related to combing, Recent developments in combing,
Speed Frame: Objectives of speed frame, conventional and modern roving processes, Mechanism of drafting, twisting and winding.

UNIT IV

Basic principle of designing of cone drum, Differential motions, Building motions, their objects and types, Roving tension, coil spacing, drafting systems, common defects in roving packages, their causes and remedies, Processing of man-made fibres on speed frame, Performance assessment of Speed frame, Calculations related to speed frame, Recent developments in speed frame.

Reading List

Title	**Author**
Spun Yarn Technology, Vol I& II	A Venkatasubramani
Short Staple Spinning Vol I, II, III & IV	W Klein
Spinning of Manmade & Blends on Cotton System	KR Salhotra
Manual of cotton spinning (Drawframes, Combers and speedframes)	Frank Charnley
Cotton Spinning	WS Taggart
Cotton Drawing & Roving	GR Merrill

Course Outcomes

At the end of the course, the students will:

- have the detailed knowledge including the function of each part of draw frame, sliver lapper, ribbon lapper, comber and speed frame the intermediate preparatory stages of yarn formation for processing different materials;
- have learnt the principle and working of draw frame, sliver lapper, ribbon lapper, comber and speed frame
- be able to calculate various parameters like draft, noils, production and efficiency related to draw frame, sliver lapper, ribbon lapper, comber and speed frame.

PCC–TT–208 G Fabric Manufacture–II

Course code	**PCC–TT–208 G**				
Category	Professional Core Course				
Course title	Fabric Manufacture–II				
Scheme and Credits	L	T	P	Credits	Semester–IV
	3	0	0	3	
Branch	Textile Technology				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Science subjects of Physics, Chemistry and Mathematics **Course Objectives:**

The course is designed to make the students aware of:

- basic concepts of knitting and knitted fabrics
- types of knitting and their application areas
- different knitting elements and their types and functioning
- different knitted fabric structures, notations, production and properties
- knitted fabric geometry and related calculations

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 06 parts of 2.5 marks from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT I

Definitions of Knitting and Knitted fabrics: stitch, differences between woven and knitted fabrics; Classification of knitting; differences between weft and warp knitting, characteristics of weft knit and warp knit structures.

Weft Knitting: Classification of weft knitting machines. General description of weft knitting machines viz. Flat and Circular, primary knitting elements, types of Knitting Needles (Latch, bearded and compound), their knitting cycle, comparison and use.

UNIT II

Knit, Tuck and Float Stitches, their formation in machine, properties and applications. Basic weft knitted structures (Plain, Rib, Interlock and Purl) and their properties. Description of machines: Non

sinker and sinker single jersey, Rib and Interlock double jersey and Purl knitting machine along with knitting cycle, design of cams.

UNIT III

Warp Knitting: Classification of warp knitting machines. Description and knitting cycle of Raschel and Tricot machines, Prominent structures like Tricot, Lock knit, Reverse Lock knit, Satin, Sharkskin and their uses.
Patterning: Patterning Devices and their mechanism: multi-cam track, pattern wheel jacquard, pattern cylinder and electronic jacquard.

UNIT IV

Knitted Fabric Geometry and calculations: Tight and distorted knitted structure geometry. Derivations of formulae and calculations for fabric width, Tightness factor, Stitch density, Areal density, Fabric cover and knitting machine production.
State of Knitted fabrics: Dry, Wet and Finished relaxed;
Characteristics of yarns used for knitting.
Major Knitted fabric faults, their causes and remedies.
Developments in knitting technology

Reading List

Title	**Author**
Knitting Technology	Ajgaonkar
Warp Knitting Production	S Ray, Melliand
Knitting Technology	David J Spencer
Circular Knitting	C Iyer, B Mammel and W Schach

Course Outcomes:
After completion of the course, students will be able to:

- understand the basic concepts of knitting and its types
- identify and understand the role of different knitting elements
- comprehend the major knitted fabric structures, their properties and production
- understand the geometry of knitted structure and its relevance

PCC–TT–209 G Fabric Structure

Course code	**PCC–TT–209 G**				
Category	Professional Core Course				
Course title	Fabric Structure				
Scheme and Credits	L	T	P	Credits	Semester–IV
	3	0	0	3	
Branch	Textile Technology				
Class work	25 Marks				
Exam	75 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Science subjects of Physics, Chemistry and Mathematics **Course Objectives:**

The course is designed to make the students understand:

- basic concepts of fabric structure and weave design
- different types of basic weave designs and their derivatives
- different types of decorative weaves

Note: Examiner will set nine questions in total. Question one will be compulsory. Question one will have 06 parts of 2.5 marks from all units and remaining eight questions of 15 marks each to be set by taking two questions from each unit. The students have to attempt five questions in total, first being compulsory and selecting one from each Unit.

UNIT I

Basic Concepts: Importance of fabric structure, Classification of fabrics, Notation of Weave, drafting plan, peg plan and denting.
Simple Weaves: plain weave and its derivatives, ornamentation;

UNIT II

Twill weave and its derivatives, ornamentation, effect of twist on prominence of twill lines, Sateen and Satin and their extensions; Crepe weave, diamond weave;

UNIT III

Mockleno, Cork-screw, honey comb, huck-a-back, Bedford cords, welt and pique fabrics;

UNIT IV

Decorative Weaves: Extra warp and weft figuring Backed cloth, Double cloth, treble and multiply belting structures.
Draft, peg plan and denting plan for all simple and decorative weaves, Particulars of common varieties of these fabrics.

Reading List

Title	**Author**
Textile Design and Colour	W Watson
Watson's Advanced Textile Design	W Watson
Grammer of Textile Design	H Nisbet
Woven Cloth Construction	Marks and Robinson

Course Outcomes:
After completion of the course, students will:

- have the knwledge of fabric structure and weave designs
- be able to identify and design different types of elementary and decorative weaves along with drafting, denting and peg plans

ESC–TT/TC/FAE –202 G Computer Aided Textile Designing Lab

Course code	**ESC–TT/TC/FAE–202 G**				
Category	Engineering Science Course				
Course title	Computer Aided Textile Designing				
Scheme and Credits	L	T	P	Credits	Semester–IV
	0	0	2	1	
Branch	Textile Technology, Textile Chemistry, Fashion & Apparel Engineering				
Class work	25 Marks				
Exam	25 Marks				
Total	50 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Science subjects of Physics, Chemistry, Mathematics and Computer **Course Objectives:**

- This Lab course is designed to impart first-hand experience of handling CAD softwares for Textile Designing thus serving as a bridge between theory and practice.

Contents:

Warp and Weft Colour Pattern designing using Elements of design and Principles of designs, like line, dot, print etc.; Types of lines and their application in designing; Types of dots as polka dot, etc. General idea about weave and colour effect; Composition of designs–by Geometric ornamentation by the conventional treatment of natural and artificial forms and by the adoption and reproduction of earlier designs; Geometric ornamentation, construction of symmetrical figures, Reversing inclined figures; Practical Application of Elements of Design and Principles of design using CAD.

Weave designing using Arrangement of figures- unit-repeating design, the drop device, drops reverse designs, sateen system of distribution (with reference to half drop, diamond base, ogee base, rectangular base lines). Construction of designs from incomplete repeat; Border designing: Study of pattern–historical precedents. Symmetry–principle concepts, perspectives and its application, classification of motifs, border patterns, all over patterns; CAD practical application in Weave designs, arrangement of figures, Border designing and Motif and repeat making.

List of Experiments:

1. To study different selection option tools in Adobe Photoshope
2. To study imge adjustment modes and tools in graphic designing software

3. To study different image transformation tools
4. To create motif vector by print designing
5. To crete shade cards of above designed print
6. To create textile patterns for designed prints
7. To study different colour modification tools
8. To drape designed fabric patterns on apparels and fashion accessories
9. To design fashion show ramp using previously designed apparels and accessories
10. To design technical and graphical parameters of yarn
11. To develop fabric using above designed yarn as per the desired weave parameters

Course Outcomes:

The students will be able to practically handle:

- elements and principles design using CAD systems;
- arrangement of figures and motifs using various methods
- geometrical ornamentation
- placement of patterns in symmetric and asymmetric way;
- creation of Border designs.

LC–TT–205G Spinning Lab–II

Course code	**LC–TT–205 G**				
Category	Professional Core Course				
Course title	Spinning Lab–II				
Scheme and Credits	L	T	P	Credits	Semester–IV
	0	0	2	1	
Branch	Textile Technology				
Class work	25 Marks				
Exam	25 Marks				
Total	50 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Science subjects of Physics, Chemistry and Mathematics **Course Objectives:**

- This Lab course is designed to impart first-hand experience of handling draw frame, Lap former, Comber and Simplex machines thus serving as a bridge between theory and practice.

Contents

Practice in handling, operation, setting and gauging draw frame, Lap former, comber and simplex.
Study of constructional details of machines: various control and change places etc.
Practice in checking the quality of comber lap, sliver and waste analysis, common fault and remedies,
Calculations pertaining to gearing, speeds, constant, draft and production etc.

List of Experiments:

1. To study the following aspects of a draw frame in the Lab:

    - Objectives and flow of material mentioning the name of each part;
    - Gearing plan;
    - Calculation of Rotational and Surface speed of different rollers;
    - Calculation of Individual Draft and total draft between different rollers;
    - Calculation of Draft constant, Break draft constant, and production constant;
    - Calculation of Production;
    - Different change places.

2. To study the following aspects of a Lapformer in the Lab:

    - Objectives and flow of material mentioning the name of each part;
    - Gearing plan;

- Calculation of Rotational and Surface speed of different rollers;
- Calculation of Individual Draft and total draft between different rollers;
- Calculation of Draft constant and production constant;
- Calculation of Production;
- Different change places.

3. To study the following aspects of a Comber in the Lab:

- Objectives and flow of material mentioning the name of each part;
- Gearing plan;
- Calculation of Rotational and Surface speed of different rollers;
- Calculation of Individual Draft and total draft between different rollers;
- Calculation of Draft constant and production constant;
- Calculation of Production;
- Different change places;
- Different setting and gauges.

4. To study the following aspects of a Simplex Machine in the Lab:

- Objectives and flow of material through the machine mentioning the name of each part;
- Gearing plan;
- Calculation of Surface speed and draft ratio of drafting system;
- Calculation of Draft constant, Break draft constant, Twist constant and production constant;
- Calculation of Bobbin speed at its minimum and maximum diameter;
- Calculation of Spindle speed, bobbin rail speed and other parts speeds;
- Calculation of Coils per inch and production calculation;
- Building motion principle with neat and clean diagram;
- Different change places.

Course Outcomes:

The students will be able to practically handle:

- Draw frame and set it for processing different fibres;
- Lapformer and set it for different materials;
- Comber and set it for processing different varieties of cotton;
- Simplex and set it for processing different materials.

LC–TT–206G Weaving Lab–II

Course code	**LC–TT–206 G**				
Category	Professional Core Course				
Course title	Weaving Lab–II				
Scheme and Credits	L	T	P	Credits	Semester–IV
	0	0	2	1	
Branch	Textile Technology				
Class work	25 Marks				
Exam	25 Marks				
Total	50 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Science subjects of Physics, Chemistry and Mathematics **Course Objectives:**

- This Lab course is designed to impart first-hand experience of features, layout, secondary and auxiliary mechanisms of shuttle looms and their settings. It also helps students practically understand in-depth working of basics of knitting operations in flat and circular knitting machines

Contents:

Study of construction, working and related calculation/settings of secondary and auxiliary motions in shuttle looms (negative let-off, 5 & 7 wheel take-up, warp protector, warp and weft stop, automatic pirn change);
Study of weft knitting process: Specifications, path of yarn, construction, operation of circular and flat bed weft knitting machines, primary knitting elements and their working, yarn feed, stop motions, patterning possibilities. Weft knitted fabric sample preparation.

List of Experiments:

1. Study of Five and Seven Wheel take-up mechanism
2. Study of negative and Cimmco Let-off mechanism
3. Study of Fast Reed Warp protector motion in shuttle looms
4. Study of Loose Reed Warp protector motion in shuttle looms
5. Study of Warp Stop motion (Mechanical Vibrator Bar type) in shuttle looms
6. Study of Weft Stop motion (side weft fork type) in shuttle looms
7. Study of Multiple Box motion (4×1 Cowburn & Peck's Drop Box type) for weft patterning in shuttle looms
8. Study of automatic pirn change mechanism in shuttle looms

9. Study of Weft Knitting process, principle of weft knitted loop formation, basic weft knitting cam structure and specification of different knitting machineries in the workshop
10. Study of Flat Bed (Single Bed) Weft knitting machine
11. Study of Flat Bed (Double Bed) Weft knitting machine
12. Study of Circular Bed Weft knitting machineries
13. To produce different fabrics on flat double bed weft knitting machine and study their properties

Course Outcomes:

After completion of the course, students will be able to:

- Correlate between theory and practice of the concept of shuttle looms
- Visualise the mechanisms of secondary and auxiliary motions of shuttle weaving machines and comprehend their settings
- Correlate between theory and practice of the concept of knitting machines
- Visualise the mechanisms of knitting machines and comprehend their settings
- Develop practical skills relevant to industrial practice

LC–TT–207G Fabric Analysis Lab

Course code	**LC–TT–207 G**				
Category	Professional Core Course				
Course title	Fabric Analysis Lab				
Scheme and Credits	L	T	P	Credits	Semester–IV
	0	0	2	1	
Branch	Textile Technology				
Class work	25 Marks				
Exam	25 Marks				
Total	50 Marks				
Duration of Exam	03 Hours				

Pre–requisites: Basic Science subjects of Physics, Chemistry and Mathematics **Course Objectives:**

- This Lab course is designed to impart first-hand experience of the recognition of constructional parameters of woven fabrics from a fabric swatch. This skill will help the students for production and planning of woven fabrics as well as quality control of fabric.

Contents:

Basic principles involved in analysis of woven fabric and estimation of data for cloth reproduction. Identification of materials, type of yarns used in their construction, weave analysis, sett and cover factor. Warp Count, Weft Count and weight calculations for simple and compound woven structures, Specifications for standard woven fabrics.

List of Experiments:

1. To analyse the constructional parameters of plain woven fabrics
2. To analyse the constructional parameters of derivatives of plain designs
3. To analyse the constructional parameters of various types twill designs
4. To analyse the constructional parameters of satin and sateen designs
5. To analyse the constructional parameters of Bedford cords and honey combs designs
6. To analyse the constructional parameters of double cloths

Course Outcomes:

After completion of the course, students will be able to:

- able recognise different types of weave designs
- able to analyse different constructional parameters of woven fabrics like yarn linear density, end and picks per unit length, fabric cover, fabric areal density
- develop practical skills relevant to fabric quality control

MC–108G Essence of Indian Knowledge Tradition

Course code	**MC-108G**				
Category	Mandatatory Course				
Course title	Essence of Indian Knowledge Tradition				
Scheme and Credits	L	T	P	Credits	Semester–IV
	0	0	2	0	
Branch	Textile Technology, Textile Chemistry, Fashion & Apparel Engineering				
Class work	50 Marks				
Exam	00 Marks				
Total	50 Marks				
Duration of Exam	00 Hours				

Pre–requisites: Basic Science subjects of Physics, Chemistry and

Mathematics **Course Objectives:**

The course is designed to impart the following:

Course objective

The course aims at imparting basic principles of thought process, reasoning and inferencing. Sustainability is at the core of Indian Traditional knowledge Systems connecting society and nature. Holistic life style of yogic science and wisdom capsules in Sanskrit literature are also important in modern society with rapid technologicaladvancements and societal disruptions. Part-I focuses on introduction to Indian Knowledge Systems, Indian perspective of modern scientific world-view, and basic principles of Yoga and holistic health care system.

Course Contents

- Basic structure of Indian Knowledge System: अष्टादशविद्या ४वेद,४उपवेद (आयुर्वेद, धनुर्वेद, गन्धर्ववेद, स्थापत्य आदि) ६वेदांग (शिक्षा, कल्प, निरुक्त, व्याकरण, ज्योतिष, छंद) ४ उपाङ्ग (धर्मशास्त्र, मीमांसा, पुराण, तर्कशास्त्र)
- Modern Science and Indian Knowledge System
- Yoga and Holistic Health care
- Case studies